

ISSN 0974-763X

UGC-CARE Listed Journal

SOUTH ASIAN JOURNAL OF MANAGEMENT RESEARCH (SAJMR)

Listed in UGC-CARE
Special Issue

Volume 14, No.4

November, 2024



**Chhatrapati Shahu Institute of Business
Education & Research (CSIBER)**

(An Autonomous Institute)

University Road, Kolhapur - 416004, Maharashtra State, India.

website : www.siberindia.edu.in

E-mail : editorsajmr@siberindia.edu.in

Published by
CSIBER Press, Central Library Building

Chhatrapati Shahu Institute of Business Education & Research (CSIBER)

(An Autonomous Institute)

University Road, Kolhapur - 416004, Maharashtra State, India

Phone : 0231-2535706 / 2535707

website : www.siberindia.edu.in

E-mail : editorsajmr@siberindia.edu.in



-  **Chief Patron**
Late Dr. A. D. Shinde
-  **Patrons**
Dr. R. A. Shinde
President & Managing Trustee, CSIBER, Kolhapur, India
-  **C.A. H. R. Shinde**
Secretary & Trustee, CSIBER, Kolhapur, India
-  **Editor**
Dr. Pooja M. Patil
CSIBER, Kolhapur, India
-  **Editorial Board Members**
Dr. S. P. Rath
Director, CSIBER, Kolhapur, India
-  **Dr. Deribe Assefa Aga**
Ethiopian Civil Service University, Addis Ababa, Ethiopia
-  **Dr. Biswajit Das**
KSOM, KIIT, Bhubaneshwar, India
-  **Dr. Yashwant Singh Rawal**
Parul University, Vadodara, India
-  **Dr. Yuvraj Sunecher**
University of Technology, Mauritius
-  **Dr. Nyo Nyo Lwin**
Yangon University of Education, Myanmar
-  **Dr. Needesh Ramphul**
University of Technology, Mauritius
-  **Dr. K. Arjunan**
University of Vavuniya, Sri Lanka
-  **Dr. Amitabye Luximon-Ramma**
University of Technology, Mauritius
-  **Superintendent**
Mrs. Maithili Santosh
CSIBER, Kolhapur, India
-  **Type Setting & Formatting**
Mrs. Vidya Ingawale
CSIBER, Kolhapur, India

Chhatrapati Shahu Institute of Business Education and Research (CSIBER)

South Asian Journal of Management Research (SAJMR) Special Issue

Volume 14, No. 4, November 2024

Editor: Dr. Pooja M. Patil

Publisher

CSIBER Press

Central Library

Chhatrapati Shahu Institute of
Business Education & Research (CSIBER)
University Road, Kolhapur – 416004, Maharashtra, India.
Phone: 91-231-2535706/07, Fax: 91-231-2535708,
Website: www.siberindia.edu.in
Email: csiberpress@siberindia.edu.in
[Editor Email: editorsajmr@siberindia.edu.in](mailto:editorsajmr@siberindia.edu.in)

Editorial Note

South Asian Journal of Management Research (SAJMR), is a scholarly journal that publishes scientific research on the theory and practice of management. All management, computer science, environmental science related issues relating to strategy, entrepreneurship, innovation, technology, and organizations are covered by the journal, along with all business-related functional areas like accounting, finance, information systems, marketing, and operations. The research presented in these articles contributes to our understanding of critical issues and offers valuable insights for policymakers, practitioners, and researchers. Authors are invited to publish novel, original, empirical, and high quality research work pertaining to the recent developments & practices in all areas and disciplines.

Cross-functional, multidisciplinary research that reflects the diversity of the management science professions is also encouraged, the articles are generally based on the core disciplines of computer science, economics, environmental science, mathematics, psychology, sociology, and statistics. The journal's focus includes managerial issues in a variety of organizational contexts, including for profit and nonprofit businesses, organizations from the public and private sectors, and formal and informal networks of people. Theoretical, experimental (in the field or the lab), and empirical contributions are all welcome. The journal will continue to disseminate knowledge and publish high-quality research so that we may all benefit from it.

Dr. Pooja M. Patil

Editor

Copyright © 2024 Authors
All rights reserved.

Address:

CSIBER Press

Central Library Building

Chhatrapati Shahu Institute of Business Education and Research (CSIBER),
University Road Kolhapur, Maharashtra - 416004, India.

All Commercial rights are reserved by CSIBER Press. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in form or by any means, Electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the publisher.

The views expressed in this journal are entirely those of the authors. The printer/publisher and distributors of this book are not in any way responsible for the views expressed by the author in this journal. All disputes are subject to arbitration; legal actions if any are subject to the jurisdictions of the courts of Kolhapur, Maharashtra, India.

ISSN: 0974-763X

Price: INR ₹ 1,200/-

Editor: Dr. Pooja M. Patil

Distributed By

CSIBER Press

Central Library

Chhatrapati Shahu Institute of
Business Education & Research (CSIBER)
University Road, Kolhapur – 416004, Maharashtra, India.
Phone: 91-231-2535706/07, Fax: 91-231-2535708,
Website: www.siberindia.edu.in
Email: csiberpress@siberindia.edu.in

**South Asian Journal of Management Research
(SAJMR)**

Special Issue

Volume 14, No. 4

November, 2024

C O N T E N T S

Sr. No	Title Author	Page No
1	Assessing the Impact of the COVID-19 Pandemic on Employment Legislation and Workers' Rights in Mauritius Dr. Viraj Fulena Lecturer in Law, University of Technology, Mauritius Miss. Oorvashi Dewdane Independent Researcher, University of Technology, Mauritius	01-12
2	Standard Operating Procedures for Corruption Risk Assessment (CRA) Studies of Selected Global Public Agencies Dr. Najimaldin Mohammedhussen Sado Advisor, Anti Corruption and Ethical Commision, Addis Ababa, Ethopia Prof. Dr. Siba Prasad Rath, Director, CSIBER, India	13-22
3	Revisiting Financial Inclusion through Geographic and Demographic Penetration: A Cross Sectional District Level Study of Assam Dr. Nitashree Barman Assistant Professor, Department of Accountancy, Pandit Deendayal Upadhyaya Adarsha Mahavidyalaya, Tulungia, Bongaigaon, Assam, India.	23-32
4	Design and Study of Integrated Desiccant Dehumidification and Vapour Compression for Energy-Efficient Air Conditioning System Mr. Siddharth Rath Ph. D. Research Scholar, Department of Chemical Engineering, Indian Institute of Technology, Bombay (IIT – B), India	33-60
5	Exploring the Role of Staff Education in Enhancing Job Satisfaction: Insights from Universities and Institutions in Uttarakhand, India Dr. H. M. Azad Associate Professor, Department. of Management studies, Graphic Era University, Dehradun, India Dr. Smriti Tandon Associate Professor, Department of Management studies, Graphic Era University, Dehradun, India Dr. Surendra Kumar Associate Professor, Department of Business Management, HN BG Central University, Srinagar (Garhwal), Uttarakhand, India	61-81
6	Crisis at One End, Opportunity on the other: Sri Lankan Crisis A Surge for Indian Tea and Textile Exports Dr. Deepika Kumari Assistant Professor, Department of Economics, Shyamlal College, University of Delhi, India.	82-96

7	Market Reactions to Green Bond Issuances in India: Insights from the BSE 200 Index Miss. Megha Rani Patel Research Scholar, Department of Commerce and Financial Studies, Central University of Jharkhand, Ranchi, India Dr. Bateshwar Singh Associate Professor, Department of Commerce and Financial Studies, Central University of Jharkhand, Ranchi, India Dr. Ajay Pratap Yadav Assistant Professor, Department of Commerce and Financial Studies, Central University of Jharkhand, Ranchi, India	97-114
8	The Influence of Knowledge Management Enablers on Knowledge Sharing: An Empirical Analysis of Hospitality Sector Dr. Jitender Kaur Assistant Professor, Department of Commerce and Management, Khalsa College Patiala, Punjab, India Dr. Parminder Singh Dhillon Head and Assistant Professor, Department of Tourism Hospitality and Hotel Management, Punjab University Patiala, Punjab, India	115-132
9	Exploring the Impact of Psychological Determinants and Financial Literacy on Retirement Planning in Tribal Communities with Reference to Bodoland Territorial Region, Assam. Miss. Rosy Basumatary Research Scholar, Department of Management Studies, Bodoland University, Kokrajhar, Assam, India Dr. Nayanjyoti Bhattacharjee Assistant Professor, Department of Management Studies, Bodoland University, Kokrajhar, Assam, India	133-144
10	The Role of Leadership Behavior and Emotional Intelligence in School Principals' Effectiveness During the COVID-19 Pandemic: A Study of Adaptive Strategies and Outcomes. Ms. Sujatha Koshy Research Scholar, Psychology, Amity Institute of Psychology and Allied Sciences, Amity University, Noida, Uttar Pradesh, India Dr. Mamata Mahapatra Professor, Amity Institute of Psychology and Allied Sciences, Amity University, Noida, Uttar Pradesh, India Dr. Shadab Ahamad Ansari Professor, Psychology in School of Liberal Allied Science Education, Galgotias University, Noida, Uttar Pradesh, India	145-163

11	Unlocking Micro Small and Medium Enterprises Potential: Addressing Financial Barriers through Government Initiatives Cs. Priya Chandak Research Scholar, Department of Accounting and Financial Management, Faculty of Commerce, The Maharaja Sayajirao University, Baroda Gujarat, India. Dr. Nidhi Upendra Argade Assistant Professor, Department of Accounting and Financial Management, Faculty of Commerce, The Maharaja Sayajirao University, Baroda, Gujarat, India	164-178
12	Influence of Personality Traits of Celebrity Endorsers on Buying Decisions of Gen-Z Girls: A Study Mr. Nandita Dey Ph.D. Research Scholar, Department of Commerce, Assam University, Silchar, Assam, India Dr. Kingshuk Adhikari Associate Professor, Department of Commerce, Assam University, Silchar, Assam, India Dr. Dinesh Kumar Pandiya Former Professor, Department of Commerce, Assam University, Silchar, Assam, India	179-186
13	Micro Celebrities as Influencers by Self Presentation on Social Media Online: Gaining Consumer Equilibrium Ms. Amla K.K Research Scholar, Jamal Mohammed College, Affiliated to Bharathidasan University, Tiruchirappalli, Tamilnadu, India Dr. A. Khaleelur Rahman Associate Professor, Jamal Mohammed College, Affiliated to Bharathidasan University, Tiruchirappalli, Tamilnadu, India	187-196
14	Technological Innovations in Indian Higher Education Institutions: A Regional Study of the Indian Subcontinent Ms. Rashi Jain Research Scholar, Bharati Vidyapeeth (Deemed to be University), Pune, India. Prof. (Dr.) Broto Rauth Bhardwaj Professor, Bharati Vidyapeeth Institute of Management & Research, New Delhi, India	197-202
15	HR Analytics: A Quantitative Analysis of Employee Data and Business Outcomes in Private Sector Organizations in India Mr. Atul Chanodkar Research Scholar, Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore, M.P., India Dr. T. K. Mandal Professor, Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore, M.P., India	203-211
16	Empowering Institutions and Clients: Unleashing Financial Innovation” Dr. Vishal Goel Associate Professor, Head of the Department Department of Innovation and Entrepreneurship, Swarnim Startup & Innovation University, Gandhinagar, India.	212-227

17	Examining the Role of Big Five Personality Traits on Entrepreneurial Intention of Rural Youth in Haryana Ms. Kiran Research Scholar, Department of Management, Akal College of Economics, Commerce and Management Eternal University, Baru Sahib, Himachal Pradesh (173101), India Dr. Ankit Pathania Assistant Professor, Department of Management, Akal College of Economics, Commerce and Management Eternal University, Baru Sahib, Himachal Pradesh (173101), India Dr. Vikash Assistant Professor, Department of Food Business Management & Entrepreneurship Development, National Institute of Food Technology Entrepreneurship and Management, Kundli, Sonipat, Haryana (131028) India	228-237
18	A Method for Improvisation of Electronic Data Exchange in E-Commerce Applications Dr. Mohammed Shameer M C Assistant Professor, Dept. of Computer Science, Farook College(Autonomous), Kozhikode, India Miss. Mubeena V Assistant Professor, Dept. of Vocational Studies, Farook College, Kozhikode, India.	238-246
19	Exploring the Decades of Research on Earnings Management: A Longitudinal Bibliometric Analysis Manu Abraham Research Scholar, Cochin University of Science and Technology (CUSAT)-Kochi, Kerala, India Santhosh Kumar S Professor, Cochin University of Science and Technology (CUSAT)- Kochi, Kerala, India	247-262
20	Transforming Learning for Sustainable Progress: University of Technology Mauritius's Post-COVID Educational Strategy Dr. Havisha Vaghjee, Sr. Lecturer, School of Business Management & Finance, University of Technology Mauritius	263-273
21	Dynamics of Job Satisfaction and Organizational Citizenship Behaviour: An Analytical Study Miss. Neha Arora Ph.D Scholar, Arni School of Business Management & Commerce ARNI University, Kathgarh, Indora, Kangra, Himachal Pradesh, India. Dr. Jaiman Preet Kaur Professor, Arni School of Business Management & Commerce ARNI University, Kathgarh, Indora, Kangra, Himachal Pradesh, India. Dr. Roopali Sharma Professor, Amity Institute of Psychology & Allied Sciences Amity University, Sector-125, Noida, Uttar Pradesh, India.	274-283
22	Systematic Analysis of Online Review Credibility: A Bibliometric Study and Research Trajectory Miss. Serene Anna Sam Research Scholar, Post Graduate and Research Department of Commerce, Nirmala College, Muvattupuzha, Kerala & Assistant Professor, Department of Commerce, Mar Thoma College for Women, Perumbavoor, Kerala, India. Dr. Gireesh Kumar G. S Principal, Henry Baker College, Melukavu	284-296

23	Examining Party Autonomy and Voluntariness in Alternative Dispute Resolution Processes Dr. Viraj Fulena Lecturer in Law, University of Technology, Mauritius Mr. Gaël Henriette-Bolli Lecturer in Law, Open University of Mauritius	297-309
24	Health Care Scenario in India and Antecedents of Job Crafting of Doctors Working in Public and Private Sector in Kolhapur, India. Mrs. Madhura K. Mane, Assistant Professor, Chhatrapati Shahu Institute of Business Education and Research (CSIBER), Kolhapur, India Dr. Reshma Kabugade, Associate Professor, NBN Sinhgad School of Management Studies, Pune, India.	310-323
25	An Analysis of the Challenges Faced by Small and Medium Enterprises in Mauritius Dr. Y. Sunecher Senior Lecturer, University of Technology Mauritius Dr. N. Ramphul Associate Professor in Management, University of Technology Mauritius Dr. H. Chitto Professor, University of Technology Mauritius Ms. F. Udhin University of Technology Mauritius	324-335
26	Identifying Barriers to the Glass Ceiling in the Indian Information Technology Sector: A Confirmatory Factor Analysis and Structure Equation Modelling Approach Ms. Swati Assistant Professor, Department of Commerce, Govt. College Hathin, Palwal, Haryana, India Dr. Manisha Arora Associate Professor, Department of Management Studies, Deenbandhu Chhotu Ram University of Science and Technology, Murthal, Haryana, India	336-344
27	A Study on Usage of Digital Financial Services in Odisha Ms. Nirmala Chandra Pattanayak Research Scholar, Department of Business Administration, Utkal University, India Dr. Rashmita Sahoo Asst. Professor, Department of Business Administration, Utkal University, India.	345-354
28	Global Perspectives in Agricultural Commodity Futures Research: A Comprehensive Literature review and Bibliometric Analysis Mrs Jenefer John Ph.D. Research Scholar, Alagappa Institute of Management, Alagappa University, Karaikudi, India. Dr. S. Rajamohan Senior Professor & Director, Alagappa Institute of Management, Alagappa University, Karaikudi, India. Mr Anand Bharathi Ph.D. Research Scholar, Alagappa Institute of Management, Alagappa University, Karaikudi, India.	355-374

29	An Impact of Service Quality Determinants on Passenger Satisfaction in Konkan Railway: The Moderating Role of Gender and Mediating Effect of Platform Services Mr. Neelesh Shashikant Morajkar Commerce Department, Sateri Pissani Education Society's, Shri Gopal Goankar Memorial, Goa Multi-Faculty College, Dharbandora – Goa, India Prof. (CA) Subrahmanya Bhat K.M Commerce Department, Vidhya Vikas Mandal's Shree Damodar College of Commerce & Economics, Margao -Goa, India	375-387
30	Hybrid Modelling Approach for Land Use Change Prediction and Land Management in the Coronie District of Suriname Ms. Tamara van Ommeren-Myslyva Anton de Kom University of Suriname, Paramaribo, Republic of Suriname Ms. Usha Satnarain Anton de Kom University of Suriname, Paramaribo, Republic of Suriname Ms. Femia Wesenhagen Ministry of Spatial Planning and Environment, Paramaribo, Republic of Suriname	388-406
31	Decoding Factors Influencing Third-Party Payment App growth in India. Mr. Shankar Singh Bhakuni Associate professor, BBD University, Lucknow, India	407-415
32	Empowering Women through AI: A Comparative Study of SHG and Micro Finance Institutions Frameworks in Rayagada, Odisha Mr. Karteek Madapana Research Scholar, School of Management Studies, GIET University, Gunupur, Odisha, India Dr.N.V.J. Rao Professor, School of Management Studies, GIET University, Gunupur, Odisha, India	416-425
33	An Empirical Study on Organisational Climate in Sugar Mills of Tamil Nadu Ms. R. CHITRA Ph. D Research Scholar Department of Commerce Bharathiyar Arts and Science College, India. Dr.D. Rajakumari Principal and HOD, Department of Commerce Bharathiyar Arts and Science College, India.	426-435
34	Enhancing Website Visibility and User Experience through Strategic On-Page Search Engine Optimization Practices Mr Anand Bharathi Ph.D. Research Scholar, Alagappa Institute of Management, Alagappa University, Karaikudi, Tamilnadu, India. Dr S Rajamohan Senior Professor and Director, Alagappa Institute of Management, Alagappa University, Karaikudi, Tamilnadu, India.	436-446
35	Work Life Balance and Its Effect on Job & Life Satisfaction of Female Employees in Higher Education Ms. Jyoti Dahinwal Research Scholar, Indira Gandhi University, Meerpur, UP, India. Dr. Jasvinder Singh Assistant Professor, Indira Gandhi University, Meerpur, UP, India. Ms. Neha Solanki Research Scholar, Indira Gandhi University, Meerpur, UP, India.	447-458

36	Impact of Visual Merchandising and Store Atmospherics on the Impulsive Buying of Customers in Salem District Mrs. P. Rajeswari Research Scholar, Sri Balamurugan Arts and Science College Sathappadi, Mecheri, Mettur, Salem, Tamil Nadu, India. Dr. T. Ragunathan Principal, Sri Balamurugan Arts and Science College, Sathappadi, Mecheri, Mettur, Salem, Tamil Nadu, India	459-468
37	The Role of Fintech in Enhancing MSMEs Growth and Economic Expansion in India Dr. Jasveen Kaur Senior Faculty, University Business School, (Gurunanak Dev Univeristy), Amritsar, Punjab, India. Ms. Sarita Saini Junior Research Fellow, University Business School, (Gurunanak Dev Univeristy), Amritsar, Punjab, India.	469-475
38	An Empirical Study of Service Quality, Customer Satisfaction, and Loyalty Dynamics among Visitors to South Indian Restaurants in Northern India Dr. Parminder Singh Dhillon Assistant Professor, Department of Tourism, Hospitality and Hotel Management, Punjabi University, Patiala, India. Dr. Anuradha Chakravarty Department of Tourism, Hospitality and Hotel Management, Punjabi University, Patiala, India.	476-492
39	Employee Well-Being in Optimising Performance at Workplace: A Bibliometric Perspective and Future Research Direction Dr. Vandana Sharma Assistant Professor, Department of Management Studies, Deenbandhu Chhotu Ram University of Science and Technology, Murthal, Haryana, India Ms. Vidhu Vats Research Scholar, Department of Management Studies, Deenbandhu Chhotu Ram University of Science and Technology, Murthal, Haryana, India Mr. Gourav Research Scholar, Department of Management Studies, Deenbandhu Chhotu Ram University of Science and Technology, Murthal, Haryana, India	493-505

Assessing the Impact of the COVID-19 Pandemic on Employment Legislation and Workers' Rights in Mauritius

Dr. Viraj Fulena

Lecturer in Law,
University of Technology, Mauritius

Miss. Oorvashi Dewdane

Independent Researcher,
University of Technology, Mauritius

Abstract

The COVID-19 pandemic has profoundly disrupted various societal and institutional aspects, significantly affecting employees' rights and employment legislation. This study focuses on the Mauritian economy, examining the pandemic's impact on working conditions, job security, and health and safety measures. Data was gathered from 161 respondents using a convenience sampling technique and analyzed with SPSS software. The findings reveal that while the pandemic has adversely affected several workplace factors. However, respondents did not perceive a decline in wage levels or a corresponding impact on their sense of being valued at work. The insights from this research can guide institutions in refining employment legislation and reinforcing employees' awareness of their rights.

Keywords: COVID-19, Employment Legislation, Workers' Rights, Job Security, Job Motivation

Introduction

Research Background

A pandemic, defined as an outbreak affecting multiple countries or continents, has far-reaching implications. COVID-19, first identified in Wuhan, China, in December 2019, rapidly spread across the globe, including to Mauritius. The pandemic's impact on global economies and labor markets has been significant, with Mauritius, a key player in the Indian Ocean tourism industry, facing particular challenges. The crisis has tested the country's labor laws and regulations, revealing the difficulties encountered by the government, businesses, and employees. Legislative efforts have focused on protecting worker safety, reducing job losses, and adapting to the evolving labor market demands. This study also investigates how the pandemic has accelerated changes in labor practices and considers the long-term implications for workers' rights in the post-COVID era. The research explores the complex landscape of Mauritius, highlighting the dynamic shifts in employment law and workers' rights prompted by the pandemic's unprecedented challenges.

Research Problem

The COVID-19 pandemic has caused unprecedented global disruptions, significantly affecting various sectors, including the workforce. In Mauritius, these disruptions have led to notable changes in employment laws and have had a profound impact on workers' rights. However, the effects of these governmental actions and legal amendments on the job environment and the protection of workers' rights in Mauritius have not been thoroughly explored. Dobbins et al. (2023) emphasize the importance of examining the impact of the pandemic and public health responses on workers and work outcomes across different institutional settings, underscoring the ongoing restructuring of work as a result of the pandemic.

Aim of Study

This research aims to evaluate the impact of COVID-19 on employment legislation and workers' rights in Mauritius. It investigates the changes and adaptations made to labor laws, assessing their effect on employee protections and their effectiveness in addressing challenges posed by the pandemic. The study also considers potential legislative amendments to enhance worker protection during future public health crises. The goal is to ensure that workers' rights are adequately safeguarded in similar future events, with an emphasis on identifying any weaknesses or areas where current laws may require improvement.

Research Objectives

The research objectives are to:

- Examine the influence of the COVID-19 pandemic on the development and alteration of employment legislation and regulations in Mauritius.

- Evaluate the effects of these legislative changes on workers' rights in Mauritius, particularly in areas such as job security, working conditions, wage policies, and social protections.
- Investigate how the Mauritian workforce has responded to the impact of COVID-19 on labor laws and workers' rights, while exploring shifts in employment trends and workplace relationships.

Research Questions

- How significantly have Mauritius's employment laws been impacted by the COVID-19 pandemic?
- What modifications have been made to workers' rights in Mauritius due to the pandemic?
- How has Mauritius's labor force adapted to the new employment laws and labor market conditions brought about by the COVID-19 pandemic?

Significance of Study

This study aims to examine the impact of the COVID-19 pandemic on employment laws in Mauritius, with a focus on determining whether the changes are temporary or likely to have lasting effects. By analyzing how workers' rights have been protected, altered, or compromised, the research seeks to provide policymakers with recommendations for future actions. This study contributes to the global understanding of the pandemic's impact on employment and allows for comparisons between Mauritius and other similar countries. The research specifically focuses on the effects of the pandemic on workers' rights in Mauritius, emphasizing the need to protect the most vulnerable workers and ensure that emergency measures do not disproportionately harm low-wage earners. Additionally, the study highlights the importance of educating employees about their rights and the legal protections available to them, as well as advocating for stronger labor standards.

Literature Review

Introduction

The COVID-19 pandemic has profoundly affected various aspects of life globally, leading to the implementation of numerous measures such as lockdowns, business closures, and social restrictions to curb the virus's spread (Sanmath, 2021). These measures have had both immediate and long-term implications for people's working lives. However, the pandemic's impact on employment legislation and workers' rights remains a key focus in current research.

The International Labour Organization (ILO, 2020) highlights that the pandemic has drastically affected global labor markets, particularly in Mauritius, a nation heavily reliant on tourism. The rapid spread of COVID-19 and the subsequent lockdowns led to significant job losses and changes in employment conditions. In response, countries, including Mauritius, have modified labor regulations and introduced special measures aimed at protecting vulnerable workers, enhancing business flexibility, and supporting economic recovery (Organisation for Economic Co-operation and Development [OECD], 2020).

Mauritius, specifically, has enacted several legislative changes to address both the immediate and long-term effects of the crisis on its labor market. This review provides valuable insights for future policymaking in similar small island developing states.

Globally, the pandemic has caused severe disruptions in health, economic, environmental, and social spheres (Chakraborty and Maity, 2020). Extended lockdowns and restrictions, though effective in controlling the virus, have exacerbated these issues (Brady and Wilder-Smith, 2021; Mofijur et al., 2020). The social consequences are particularly pronounced, with significant declines in mobility (Kim and Kwan, 2022), social capital (Pitas and Ehmer, 2020; Elgar et al., 2021), and overall social and economic stability (Agarwal, 2021; Paul et al., 2021), leading to widespread disruption in social life (Motamed-Jahromi and Kaveh, 2021).

Definitions

COVID-19 Pandemic

The COVID-19 pandemic, caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), began as an international outbreak. The first cases of the novel coronavirus (nCoV) were reported in China in December 2019, and the virus rapidly spread to other countries. The World Health Organization (WHO)

declared the outbreak a Public Health Emergency of International Concern (PHEIC) on January 30, 2020, and later classified it as a pandemic on March 11, 2020.

Employment Legislation

In Mauritius, employment legislation is governed by the Workers' Rights Act, which outlines the core principles of the country's employment laws and ensures the protection of both employers' and employees' fundamental rights in a manner consistent with international standards (TalentLab.mu, 2024). The legislation comprehensively covers regulations, duties, and rights related to work contracts, wages, working hours, paid leave, and workplace health and safety. Additionally, it provides safeguards against discrimination and wrongful termination, and establishes procedures for resolving labor disputes. The framework of Mauritius' labor laws is primarily based on the Employment Relations Act and the Workers' Rights Act 2019.

Workers' Rights

Since gaining independence, the Mauritian government has made significant efforts to enhance working conditions and labour rights. Key legislative milestones include the Employment Relations Act 2008 and the Employment Rights Act 2008, which provide comprehensive frameworks for employment relations, conflict resolution, and workers' rights. The Workers' Rights Act 2019 is the principal legislation governing workers' rights in Mauritius, detailing entitlements related to working hours, compensation, leave benefits, termination of employment, and other employee protections (Workers' Rights Act 2019, 2023).

Influence of Covid-19 Pandemic on International and Local Economies

Global Influence

To curb the spread of COVID-19, most countries have implemented various non-pharmaceutical interventions (NPIs) such as lockdowns, business closures, and mobility restrictions (Juranek et al., 2021). Evidence suggests that NPIs have been effective in mitigating adverse health effects (Cho, 2020). However, concerns persist about the potential economic and labor market damage caused by these measures (Cajner et al., 2020). Lockdowns, in particular, are expected to lead to significant economic hardship (Baldwin & Weder di Mauro, 2020), presenting a dilemma for governments between economic stability and public health (Lin & Meissner, 2020).

The Nordic region provides a useful context for examining the varied effects of NPIs on labor market outcomes due to its similar economic, healthcare, and judicial frameworks (Juranek et al., 2021). Prior to the COVID-19 crisis, employment trends in the Nordic countries were relatively similar (OECD, 2018), but the countries implemented differing NPI strategies. Denmark, Norway, and Finland imposed strict NPIs restricting social interaction starting in week 11 of 2020, while Sweden opted for less severe restrictions, allowing many businesses to remain open (Juranek et al., 2021). These measures significantly impacted economic activities such as hospitality, personal services, and public transportation.

All Nordic countries introduced government initiatives to mitigate the pandemic's adverse effects on the labor market. Denmark and Sweden established short-term work schemes, with Denmark's program beginning on March 9, 2020, offering government compensation of 75% of salaries for retained employees (Bennedsen et al., 2020). Finland expanded its existing furlough program, while Norway enhanced its short-term work scheme starting March 20, 2020, covering up to 100% of the first 20 days' wages (OECD, 2020). Sweden's short-term compensation policy, effective March 16, 2020, allows employees to reduce working hours by up to 60% (80% from May 1st), with government support provided through a short-term employment allowance (Hensvik & Skans, 2020).

Local Influence

In Mauritius, a country that has made significant economic progress, health authorities announced by the end of April 2020 that over 90% of COVID-19 patients had recovered, with 312 recoveries out of 332 confirmed cases and only 7 active cases remaining. Due to the severity of the situation, the government imposed a total lockdown on March 20, 2020, which lasted six weeks until May 4, 2020 (Mamode et al., 2020). During this period, several policies were implemented, including work access permits for essential services, scheduled grocery store visits for essential supplies, mandatory COVID-19 screenings for customers, and strict enforcement of social distancing in public spaces (Mamode et al., 2020). Figure 1 below illustrates the total number of cases of COVID-19 in Mauritius.

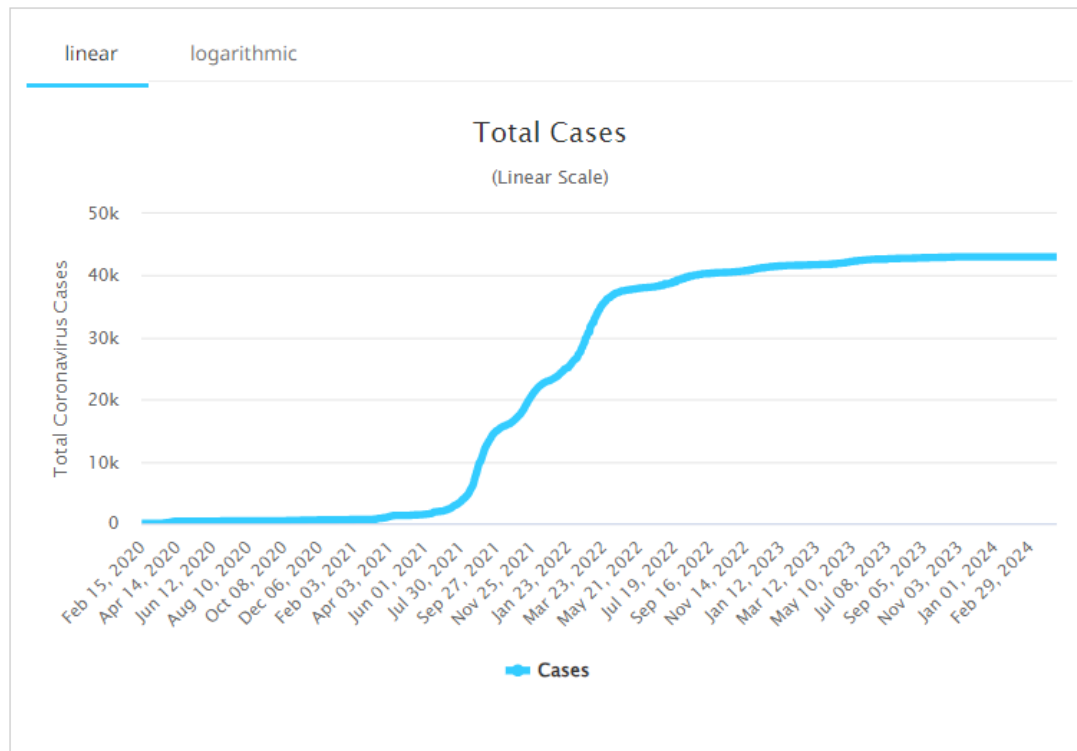


Figure 1: The Total Cases of COVID-19 Cases In Mauritius

Source: www.worldometer.com

Impact of Covid-19 Pandemic on Workers' Rights

Influence of Covid-19 Pandemic on Job Security

Lockdowns and restrictions on movement during the COVID-19 pandemic led to the closure of many businesses and limited access to labor and other essential inputs. This particularly affected low-skill workers whose tasks could not be performed remotely, resulting in a decline in labor demand and lower living standards.

To monitor the socioeconomic impact of COVID-19 on Mauritian households, the World Bank and Statistics Mauritius launched a series of quarterly household surveys from May to July 2020. These surveys were funded by the World Bank, which also provided technical assistance for data collection.

As of July 2020, employment levels were still 6.9% below those recorded in the first quarter of the year. Although the national lockdown ended in June, the return to workplaces for those unable to work remotely was gradual. This is reflected in the increase in employment levels observed in June and July compared to May, when the country was still under strict lockdown.

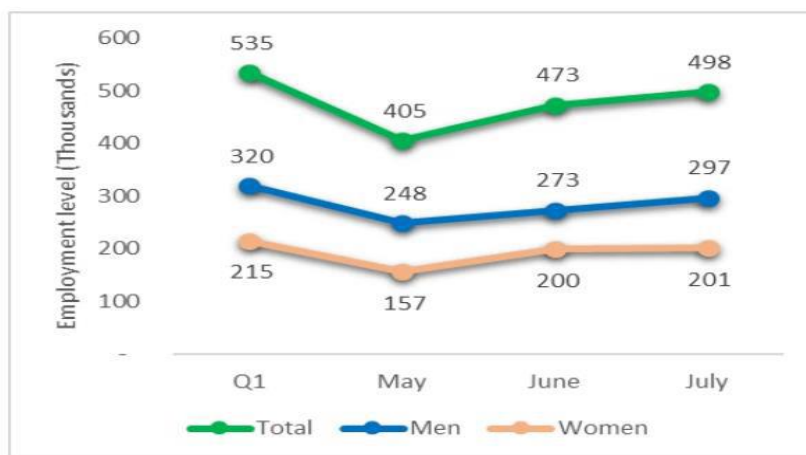


Figure 2: Trends in Employment Overall and By Sex, Q1 - July 2020

Source: World Bank, 2020

Workers in the informal sector are not covered by social security benefits and are not allowed to form trade unions, as their employment is neither regulated by the government nor officially registered. Unlike workers in the formal economy, who are protected by employment laws, those in the informal sector often work longer hours.

During the May lockdown, employment saw a significant decline, particularly in the informal sector, where non-wage and wage employment dropped by 51% and 65% respectively. Although informal employment rebounded after the lockdown, formal employment continued to struggle, falling by 10% in May and remaining 1.4% below the levels recorded in the first quarter as of July.

This is illustrated in Figure 3 below:

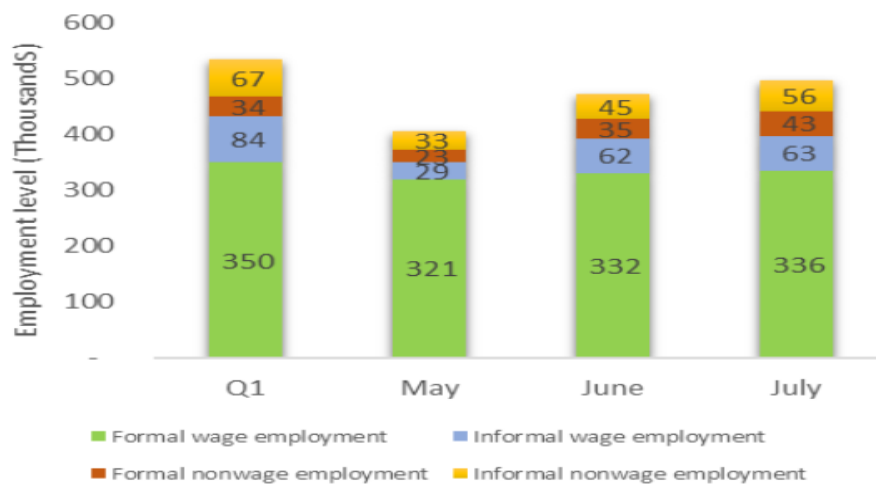


Figure 3: Trends In Employment by Type and Formality Status, Q1 - July 2020 Source: World Bank, 2020

In the context of this study, the COVID-19 pandemic has emerged as an unprecedented and uncontrollable challenge with tangible consequences for employment (Akkermans et al., 2020). The unusual surge in layoffs during the pandemic has led individuals to assess the extent to which their jobs may be at risk, thereby increasing feelings of job insecurity. Lin et al. (2021) found a positive correlation between job insecurity and the presence of the COVID-19 pandemic among Chinese workers. Perceptions of job insecurity vary among individuals; for instance, Klug et al. (2019) note that early-career workers face different levels of job insecurity based on factors such as temporary contracts or lower educational attainment. Additionally, job insecurity levels are likely to fluctuate slightly throughout the pandemic, as employment insecurity is expected to vary over time due to the prolonged nature of the outbreak (Kinnunen et al., 2014).

Influence of Covid-19 Pandemic on Working Conditions

In Mauritius, remote work was uncommon prior to the COVID-19 outbreak, with traditional office spaces being the norm and limited flexibility in work schedules. A 2018 report by the International Labour Organization (ILO) highlighted that remote employment was primarily confined to specific industries such as consulting and information technology (ILO, 2018). However, by early 2020, both companies and employees began to embrace the concept of remote work, something that seemed unimaginable just a year earlier.

The employer-employee relationship is primarily governed by an employment agreement, supplemented by mutually agreed-upon policies that dictate business operations. It is a common misconception that only the provisions of an employment contract or existing policies are legally binding in an ongoing employment relationship. In reality, all contractual provisions and policies must comply with the law, specifically the Workers' Rights Act 2019, along with relevant legislation. Consequently, the Court may declare any policy or provision invalid if it contradicts the law (Workers' Rights Act, 2019).

In this context, the Workers' Rights (Working from Home) Regulations 2020 are particularly significant. These regulations apply to all workers, whether full-time or part-time, and irrespective of whether their work is regular, irregular, or temporary. The regulations also extend to employees whose work is divided between their home, workplace, or a client's premises, imposing obligations on both employers and employees (Workers' Rights (Working from Home) Regulations, 2020).

Under these regulations, an employer may require an employee to work from home with 48 hours' notice, and the employee is obliged to comply. Conversely, an employer may, at its discretion, grant an employee's request to work from home. If remote work is to be undertaken, both parties must enter into a "Work from Home Agreement" as stipulated by the WFH Regulations. This agreement serves as a supplement to the employment contract and the provisions of the Workers' Rights Act 2019 (Workers' Rights Act, 2019).

Homeworkers, or employees working from home, are entitled to allowances for work-related expenses incurred at home, such as costs associated with utilities like electricity, water, and telecommunications. These expenses are comparable to travel allowances or bus/light rail fare provided to workers commuting to their workplace. The employer is required to reimburse the employee monthly for these work-related expenses, as agreed upon by both parties (Workers' Rights (Working from Home) Regulations, 2020).

Influence of Covid-19 Pandemic on Health and Safety

Furthermore, the employer has the right, when necessary, to conduct an appropriate assessment of the proposed workplace to ensure that working conditions do not pose a risk to the health and safety of the home worker or their family members, as stipulated by the WFH Regulations. While this provision aims to safeguard health and safety, there are concerns regarding the practicality of this right granted to employers. For instance, the privacy of the worker's family members residing at the assessment site must be considered, even though the regulations emphasize the importance of health and safety.

Responses from the Government and Employers

The responses from the government and employers in Mauritius during the COVID-19 pandemic included various legislative measures and modifications to employment policies to address the challenges brought about by the lockdown and the ongoing health crisis.

- **Regulations for a State of Emergency:** The government implemented regulations to manage the state of emergency, ensuring that legal frameworks were in place to handle the public health crisis and its impact on employment.
- **Wage Assistance Schemes:** The government introduced wage assistance programs to support businesses and employees who were financially impacted by the pandemic. This helped mitigate the adverse effects on workers' income.
- **Sanitary Measures:** Employers were required to implement sanitary measures to ensure the health and safety of employees. This included providing personal protective equipment (PPE), conducting regular health screenings, and maintaining a safe work environment.
- **Modifications to Employment Policies:** There were several modifications to existing employment policies to adapt to the new working conditions, such as the introduction of work-from-home regulations, shift work, flexitime, and adjustments in overtime pay and paid time-off. These changes aimed to provide flexibility to both employers and employees during the pandemic.
- **COVID-19 Act and Quarantine Act:** Specific legislation, such as the COVID-19 Act and Quarantine Act, was enacted to formalize the new norms and ensure compliance with health guidelines.
- **Work from Home:** The pandemic accelerated the adoption of remote working. The government and employers worked together to establish regulations and agreements that governed working from home, including provisions for covering work-related expenses incurred at home.

These responses highlight the collaborative efforts between the government and employers to safeguard workers' rights and adapt to the unprecedented challenges posed by the pandemic.

Hypothesis Formulation

This article outlines the formulation of three hypotheses that explore the impact of the COVID-19 pandemic on workers' rights, job security, and the relationship between wage decline and employees' perception of employer value.

Hypothesis 1: Changes in Working Conditions' Effect on Workers' Rights

The pandemic has led companies to adopt new working practices like remote work and flexible hours, which some employees see as beneficial to workers' rights. However, these changes have not been universally positive. For example, remote work has increased workloads, extended work hours, and caused higher stress levels. Moreover, not all employees can work remotely, especially those in manual labor or lower-paying jobs.

Null Hypothesis (H0): Changes in working conditions have no significant effect on workers' rights.

Alternative Hypothesis (H1): Changes in working conditions have a significant effect on workers' rights.

Hypothesis 2: Impact of COVID-19 Pandemic on Job Security

The pandemic has caused global economic disruption, leading to increased job insecurity. This impact varies across sectors, with some industries like technology experiencing growth and improved job security, while others have suffered more. Governments and organizations have implemented measures to protect workers' rights, such as health and safety regulations and temporary wage subsidies.

Null Hypothesis (H0): The COVID-19 pandemic has no significant impact on job security.

Alternative Hypothesis (H1): The COVID-19 pandemic has a significant impact on job security.

Hypothesis 3: Relationship between COVID-19-Related Wage Decline and Employee's Sense of Employer Value

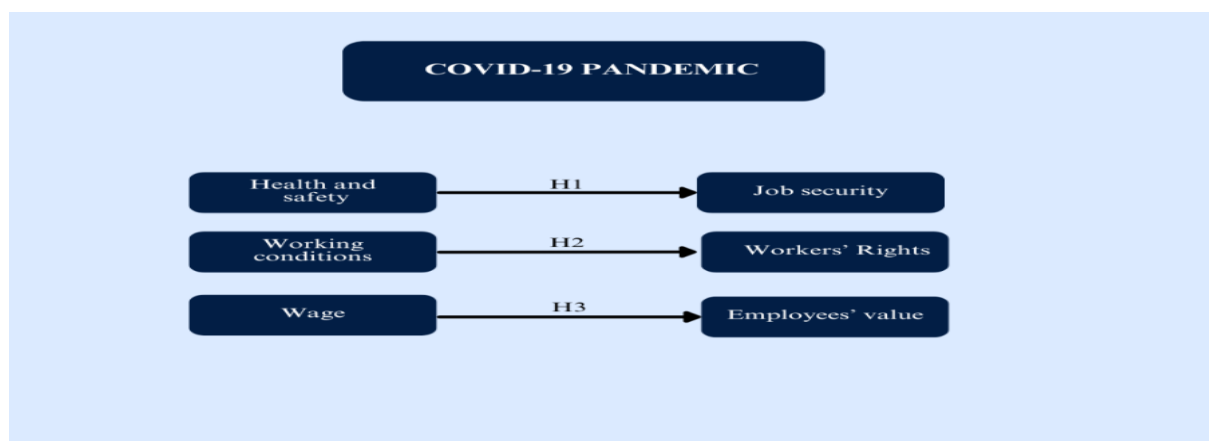
Job satisfaction is linked to positive organizational outcomes such as retention and performance. During the pandemic, wage declines, especially in low-paying jobs, have affected employees' sense of their value to their employers.

Null Hypothesis (H0): There is no significant relationship between COVID-19-related wage decline and the employee's sense of employer value.

Alternative Hypothesis (H1): There is a significant relationship between COVID-19-related wage decline and the employee's sense of employer value.

These hypotheses are designed to investigate the various dimensions of how the COVID-19 pandemic has influenced labor dynamics and employee well-being.

Conceptual Framework



Research Methodology

The research process integrates both qualitative and quantitative approaches, enabling a comprehensive analysis of the topic.

Research Design

The study adopts a combination of explanatory and descriptive research designs to explore the relationship between the pandemic and changes in employment legislation. The quantitative aspect is reinforced by statistical analysis, while the qualitative aspect is supported by in-depth interviews.

Data Collection

Primary data was collected through structured questionnaires and interviews. The sample consisted of 161 respondents, selected using a convenience sampling technique. The data collection was guided by a pilot study to ensure reliability and validity. Secondary data was also reviewed from various relevant sources to support the findings.

Sampling

The target population included employees from various sectors in Mauritius. The sampling process was carefully executed to ensure representation, with a focus on those directly impacted by the legislative changes due to the pandemic.

Data Analysis

Quantitative data was analyzed using SPSS software, employing statistical tools such as descriptive statistics, correlation analysis, and hypothesis testing to examine the relationships between variables. Qualitative data from interviews were thematically analyzed to capture insights into personal experiences and perceptions of the legislative changes.

Ethical Considerations

The study adhered to ethical standards, ensuring confidentiality and informed consent from all participants. The limitations of the study, including the scope of the sample and the challenges of data collection during a pandemic, were acknowledged.

Data Analysis

The study offers a detailed examination of how the COVID-19 pandemic has impacted employment legislation and workers' rights in Mauritius, drawing from data collected through surveys and interviews. The findings are centered around the pandemic's effects on working conditions, job security, wages, and the perceptions employees hold of their employers. This analysis provides a comprehensive understanding of the shifts in the labor market during this unprecedented time.

A key aspect of the research is the demographic profile of the respondents, which consisted of 161 individuals. The sample had a slightly higher representation of females (55%) compared to males (45%). The age distribution leaned towards a younger demographic, with 55% of respondents aged between 18 and 25 years, 40% between 26 and 40 years, and only 5% aged 41 to 60 years. Educational background was also significant, with 65% of respondents holding a graduate degree, 14% with postgraduate education, 12% holding diplomas, and 10% having completed secondary education. This demographic analysis is crucial as it ensures that the findings reflect a broad and diverse representation of the workforce in Mauritius.

The impact of the pandemic on working conditions was profound, with many employees reporting worsened conditions. The shift to remote work, changes in working hours, and varying levels of support from employers were common experiences. The study highlights the challenges that arose, particularly with inadequate home office setups and increased stress due to the blurred boundaries between work and personal life. These factors contributed to a mixed impact on workers, with some appreciating the flexibility of remote work while others struggled significantly.

Job security emerged as a major concern, with many respondents expressing anxiety about the stability of their employment during the pandemic. The research indicates that sectors hardest hit by the pandemic, such as hospitality and tourism, experienced higher levels of job insecurity. Government interventions, such as wage assistance schemes, were critical in mitigating some of these concerns, although the effectiveness of these measures varied across different sectors. This finding underscores the uneven impact of the pandemic on job security depending on the industry.

Wages and compensation were also significantly affected by the pandemic. A considerable portion of the respondents reported experiencing wage reductions, reduced working hours, or complete loss of income. These financial challenges deeply impacted employees' sense of value and morale. The study found that industries where remote work was feasible saw less impact on wages, whereas sectors like hospitality and retail faced more severe financial consequences, exacerbating the financial strain on workers.

The research further explored how employees perceived their employers' response to the pandemic. While some employers were praised for their efforts to maintain jobs and ensure safety, others were criticized for providing inadequate support and communication. The findings show a clear correlation between wage reductions and diminished perceptions of employer value. Many employees felt undervalued due to the lack of financial and emotional support during the crisis, which has significant implications for employer-employee relationships moving forward.

The legal and policy implications of the pandemic were also a focus of the study. The findings highlight the significant changes in employment legislation in Mauritius, driven by the need to address health and safety concerns, remote working conditions, and job security. New policies were introduced to protect workers, but the study suggests that these measures may not be sufficient in the long term. Continuous adaptation of legal frameworks is necessary to better protect workers' rights in future crises, ensuring that the lessons learned from the pandemic are applied to strengthen employment laws.

In conclusion, the study provides valuable insights into the profound impact of COVID-19 on employment legislation and workers' rights in Mauritius. The findings underscore the critical need for more resilient and flexible employment laws that can effectively respond to crises. As the pandemic continues to evolve, ongoing research and policy development will be essential to safeguard the rights and well-being of workers in Mauritius, ensuring that they are better protected in future challenges. The demographic data, while providing important context, also points to the need for further research with a larger, more diverse sample to validate and expand upon these findings.

Recommendations

To address the complex challenges posed by the COVID-19 pandemic on employment legislation and workers' rights in Mauritius, a multifaceted approach is recommended, beginning with a deep understanding of the external environment. Businesses must closely monitor and adapt to the political landscape, particularly the lockdown measures and restrictions enforced by the Mauritian government. These regulations have a profound impact on employment, and organizations need to remain agile, ensuring compliance while also safeguarding the rights and well-being of their employees.

Economically, it is essential to implement robust assistance programs targeted at sectors most affected by the pandemic, such as tourism, services, and education. These programs could include financial grants and strengthened tax relief schemes to alleviate the burden on struggling businesses. Moreover, thriving industries should be encouraged to recruit actively, thereby reducing unemployment and helping to bridge the gap left by sectors in decline. This strategic redistribution of resources can help stabilize the labor market and promote economic recovery.

Socially, there is a pressing need to enhance workers' awareness of their rights and responsibilities under Mauritian employment legislation. Organizations should spearhead comprehensive awareness campaigns, targeting diverse regions and populations to ensure that all workers are informed and empowered. This approach not only strengthens the workforce but also fosters a culture of respect and adherence to labor laws, ultimately contributing to more equitable and just working environments.

Technological advancement plays a crucial role in adapting to the new normal of remote work. Investments in digital infrastructure and technology are vital to support this transition, ensuring that remote working is viable

for a broader segment of the population. Furthermore, organizations should provide continuous training to enhance employees' digital literacy, enabling them to navigate the demands of distance work effectively. This technological shift must be supported by policies that ensure accessibility and inclusivity, so that all workers can benefit from these advancements.

Legally, it is imperative to establish transparent and effective compliance mechanisms to ensure that organizations adhere to new legislations introduced in the wake of the pandemic. Additionally, conflict resolution resources should be made readily available to address work-related disputes equitably. Policies aimed at eradicating gender disparities, supporting vulnerable groups, and promoting workplace inclusion should be prioritized. These measures will help create a more resilient and fair employment landscape, capable of withstanding future crises while ensuring that all employees are treated with dignity and fairness.

Conclusion

In this evolving era, it is essential for workers to be informed about their rights, and for employers to adhere strictly to employment legislation to ensure effective organizational management. Both employers and employees must be prepared to navigate any unforeseen circumstances, both now and in the future.

This study aimed to analyze the impact of the COVID-19 pandemic on employment legislation and workers' rights in Mauritius. The findings indicate that the pandemic has led to significant changes in working conditions, affecting workers' rights and job security. However, the research also suggests that while COVID-19-related wage declines were evident, they did not significantly alter employees' perceptions of their employers' value compared to the period before the pandemic.

References:

- Agarwal, S. (2021).** 'Economic disruption and stability: A global analysis'. *Journal of Economic Studies*, 48(2), pp. 153-168.
- Brady, O. and Wilder-Smith, A. (2021).** 'Lockdowns and COVID-19 transmission', *Nature Medicine*, 27(2), pp. 193-200.
- Baldwin, R. and Weder di Mauro, B. (2020).** 'Economics in the Time of COVID-19'. VoxEU.org. [online] Available at: [URL] [Accessed 13 August 2024].
- Baek, C., Hwang, J., and Park, H. (2020).** 'The effects of COVID-19 lockdowns on unemployment insurance claims'. *Economic Review*, 47(2), pp. 123-138.
- Bennedsen, M., Gertner, R., and Nielsen, K. (2020).** 'Denmark's short-term work compensation scheme during COVID-19'. *Danish Economic Journal*, 32(4), pp. 211-230.
- Cho, S. (2020).** 'Effectiveness of non-pharmaceutical interventions in controlling COVID-19'. *Health Policy Review*, 35(1), pp. 45-60.
- Cajner, T., Faberman, R. J., and Pugsley, B. (2020).** 'The impact of COVID-19 on labor markets and employment policies'. *Journal of Labor Economics*, 38(4), pp. 785-803.
- Chakraborty, I. and Maity, P. (2020).** 'COVID-19 outbreak: Migration, effects on society, global environment and prevention', *Science of the Total Environment*, 728, 138882.
- Dobbins, T., Dundon, T., & Cullinane, N. (2023).** Restructuring work during COVID-19: Impacts on employment laws and worker rights. *Journal of Industrial Relations*, 65(2), 215-233.
- Elgar, F. J., Stefaniak, A. and Wohl, M. J. A. (2021).** 'The trouble with trust: Time-series analysis of social capital, income inequality, and COVID-19 deaths in 84 countries', *Social Science & Medicine*, 263, 113365.
- Hensvik, L. and Skans, O. N. (2020).** 'Sweden's short-term job compensation policy during COVID-19'. *Nordic Economic Review*, 42(3), pp. 67-80.
- International Labour Organization [ILO]. (2020).** 'COVID-19 and the world of work: Impact and policy responses'. ILO Monitor, 5th Edition.
- Juranek, S., Schuler, K., and Trappmann, V. (2021).** 'NPIs and their economic impact: A study of the Nordic countries'. *European Economic Journal*, 56(2), pp. 311-329.
- Kim, J. and Kwan, M. P. (2022).** 'Social distancing and mobility in the context of COVID-19', *Journal of Transport Geography*, 93, 103098.
- Lin, C. and Meissner, C. (2020).** 'Economic versus health trade-offs in pandemic responses'. *Global Health Economics Review*, 21(4), pp. 99-115.
- Mofijur, M., Fattah, I. R., Alam, M. A., Islam, A. S., Ong, H. C., Rahman, S. A., and Najafi, G. (2020).** 'Impact of COVID-19 on the social, economic, environmental and energy domains: Lessons learnt from a global pandemic', *Sustainable Production and Consumption*, 26, pp. 343-359.
- Motamed-Jahromi, M. and Kaveh, M. H. (2021).** 'COVID-19 and social life: Effects and implications', *International Journal of Social Science Studies*, 9(1), pp. 10-19.
- OECD (2020).** 'COVID-19 and the world of work: Impact and policy responses'. OECD Publishing. [online] Available at: [URL] [Accessed 13 August 2024].
- Organisation for Economic Co-operation and Development [OECD]. (2020).** 'Employment Outlook 2020: Worker security and the COVID-19 crisis'. OECD Publishing.
- Paul, R., Sinha, M., Bhattacharya, S., and Biswas, M. (2021).** 'Disruption in economic and social life: A pandemic reality', *Journal of Social Science Research*, 10(1), pp. 25-40.
- Pitas, N. and Ehmer, C. (2020).** 'Social capital in the response to COVID-19', *American Journal of Public Health*, 110(6), pp. 632-634.

Sanmath, N. (2021). 'Pandemic response and its effects on global labor markets'. *Global Labor Review*, 15(3), pp. 45-60.

TalentLab.mu (2024). Employment Rights Act: Overview of Employment Legislation in Mauritius. [online] Available at: [URL] [Accessed 13 August 2024].

Workers' Rights Act 2019 (2023). Workers' Rights Act 2009: Key Provisions and Employee Protections. [online] Available at: [URL] [Accessed 13 August 2024].

Standard Operating Procedures for Corruption Risk Assessment (CRA) Studies of Selected Global Public Agencies

Dr. Najimaldin Mohammedhussen Sado
Advisor, Anti Corruption and Ethical
Commision, Addis Ababa, Ethopia

Prof. Dr. Siba Prasad Rath,
Director, CSIBER, India

Abstract

The global anti-corruption movement has paid close attention in recent years to the potential application of risk management as a tool in the battle against corruption. However, to date, no standards have been developed outlining precise and thorough procedures to be followed while conducting corruption risk assessment. The aim of this study was to evaluate the Standard Operating Procedures for Corruption Risk Assessment (CRA) studies. Further, the study aims to make appropriate recommendations on the corruption risk identification stage to the mitigation plan and implementation stage to the anti-corruption agencies (Federal Ethics and Anti-Corruption Commission of Ethiopia, FEACC). This study used secondary sources of data documents (UNDP, Methodology for Corruption Risk Assessment; Transparency International Hub, Corruption Risk Assessment Topic Guide; World Custom Organization, Guide to Corruption Risk Assessment Mapping; Council of Europe, Rationale and outline of Corruption Risk Assessment; UNODC, A Guide on Conducting Corruption Risk Assessment in Public Organizations). A document analysis can be a valuable source of information in qualitative research, and the analysis approach was content analysis. The study findings show that, to date, no standards have been developed outlining precise and thorough procedures to be followed while conducting corruption risk assessment. Therefore, the study found that, the types of corruption Risks are different in the public and private sectors and within the sectors. CRA approach is different in terms of the methodology, focus, and context. To identify corruption risks, most of the time the organizations used both secondary sources. The effective implementation of corruption risk assessment studies (mitigation plan) is determined by its contents. The study also recommends that any organizations (public and private) that conduct corruption risk assessments (CRA) should prepare the standards based on their own context. Finally, the study set the limitations and recommendations for future research.

Keywords: Standard Operating Procedures, Corruption, Risk Assessment, Governance, Organization.

Introduction

The types and understanding of corruption have expanded over time in tandem with technological breakthroughs and newly emerging/evolving human endeavors (Misra, 2016; Hijal-Moghrabi & Sabharwal, 2018; Kernaghan, 2003). Designing and understanding anti-corruption policies, strategies, and SOPs are prerequisites for determining the reasons for performance failures and finding ways to amplify the effectiveness of AC work, policies, and strategies, which are now in the spotlight and have become a global issue (Mauritius, 2018). In this regard, many scholars have been studying the driving factors of corruption and mostly mentioned the legal, institutional, and administrative systems (Brusca, Manes, Rossi, & Aversano, 2018).

Finding potential corruption-prone areas within a system and estimating the possibility and repercussions of such misconduct are the two main objectives of a corruption risk assessment study. Following that, the organizations can implement preventative measures and carry out anti-corruption initiatives. To be exact, its diagnostic technique called "corruption risk assessment" looks for systemic flaws that could provide room for corruption to flourish. It is different from other instruments for assessing corruption; it concentrates on the possibility of corruption rather than its perception, presence, or degree. Fundamentally, a risk assessment entails assessing the possibility of corruption happening and its consequences (McDevitt, 2011). Thus, ineffective institutional controls, weak laws, ineffective public spending management, a lack of transparency, conflicts of interest, and the misuse of authority and influence all contribute to corruption (Shakespeare, 2017).

Problem Statement

The global anti-corruption movement has paid close attention in recent years to the potential application of risk management as a tool in the battle against corruption. This concept's underlying premise is that corruption is a possibility in each activity that public and private sector entities engage in. Therefore, these organizations need to recognize and manage the risks that endanger their company in order to effectively prevent corruption (Petkov, 2018).

There has been much written about the advantages and justifications for why companies should implement and use risk management plans and assessments of corruption risk. In order to further urge its members to embrace and include risk management into their anti-corruption initiatives, numerous international organizations have also created their own guidelines or methodologies. Despite these initiatives, many nations continue to have difficulties when implementing risk-based strategies for preventing corruption.

It is believed that one of the primary causes of this problem is that the resources that are now available are frequently overly complex, employ erroneous techniques and strategies, and are replete with technical vocabulary. This can impede the effective execution of risk management and lead to more misunderstanding among the personnel in charge of it, along with a lack of ability, knowledge, and training. Furthermore, academics have given relatively little thought to the function of corruption risk management; as a result, anticorruption practitioners have not had much theoretical assistance in the development of the instruments that are essential for anticorruption risk management. Prior research on the subject has observed that there is little literature currently available on corruption risk assessment to help organizations successfully apply these techniques (Sharma et al., 2016). Moreover, there is a dearth of trustworthy information regarding the ways in which nations and companies enforce corruption risk management, suggesting that there may be some disparities between the current theoretical frameworks and their actual application.

To date, no standards have been developed outlining precise and thorough procedures to be followed while conducting corruption risk assessment (Transparency International, 2019). Therefore, there is a need for setting standard operating procedures for CRA studies.

Objective of the Study

The goal of this study was to evaluate the Standard Operating Procedures for Corruption Risk Assessment (CRA) studies. Further, the study aims to make appropriate recommendations on the corruption risk identification stage to the mitigation plan and implementation stage to the anti-corruption agencies and other organizations.

Research Questions

- What types of corruption Risks the public and private sectors faces?
- Does the approaches to sector level corruption risk Assessment Standards are similar?
- How anti-corruption Agencies identify the potential risks?
- How the organizations Deal with corruption Risks Mitigation?

Motivation for the Study

This study was motivated by the need to promote a clear direction for any organization, particularly anti-corruption agencies, to prevent corruption through corruption risk identification in both public and private organizations by implementing appropriate corruption risk assessment standards and procedures.

The Significance and Contribution of the Study

The findings of this study are helpful in expanding the understanding and knowledge of corruption prevention through corruption risk assessment (CRA) studies, which resulted in a corruption-free and clear working environment and the promotion of advancement of good governance in both public and business institutions. To be exact, the findings of this study are valuable for anti-corruption agencies efforts in advancing knowledge in the area.

Literature Review

What is the Corruption Risk Assessment?

A risk is the possibility of something going wrong and causing harm. The mere uncertainty of the result constitutes a risk. Everyone agrees that the study of risks is extremely important in public sector management because of this element of uncertainty in policy decisions. Governments often confront two types of risks: those that compromise the proper execution of their mandates and those that harm their reputation, which are political risks. Public risks are generally classified as trading (i.e., daily or operational swings) or strategic (i.e., expressing the fundamentals; also termed “policy risks”). The likelihood and possible impact of a risk are used to quantify it (Bhatta, 2008).

Moreover, risk assessment is a systematic process to quantify or qualify the level of risk associated with a specific threat or event to enrich the risk intelligence available to the institution. The main objective of risk assessment is to help the institution prioritize the important risks.

Anti-corruption Agency

It is a "long-term public body with the specific mission of combating corruption and reducing the opportunity structures conducive to its occurrence in society through preventive and/or repressive measures" (Makowski, 2016, p. 61). On the other hand, the OECD defines them as "permanent agencies whose primary function is to provide centralized leadership in one or more of the core areas of anti-corruption activity, including policy, analysis, and technical assistance in prevention, public outreach, and information, monitoring, investigation, and prosecution" (Makowski, 2016). Anti-corruption agencies are commonly defined as permanent legal state bodies with a specific mission and corresponding preventive and/or law-enforcing functions to counter corruption and its underlying structures (Meagher, 2005, p. 70).

Governance

Governance as a broad term encompasses the way states function, structural and institutional arrangements, decision-making procedures, policy-making, implementation capacity, information flow, leadership effectiveness, and the nature of the relationship between the rulers and the ruled. Therefore, governance affects not only the integrity, efficiency, and profitability of the state but also its effectiveness in meeting the needs toward which the organization and activities of the state are oriented (Misra, 2003). The design of the governance system is also an important aspect. Creating a network of people with distributed power, decision-making, and information flows creates a variety of independent channels of communication and supervision that facilitate localized decision-making, internal competition and cross-checking in a well-designed system. The reliability of the information needed for management and governance purposes flows through the organization (Renn, 2009).

On the other hand, the UNDP policy document defined governance as the exercise of political, economic, and administrative powers to regulate the affairs of a country. It includes the processes, mechanisms, and institutions that allow groups and individuals to express their well-being, exercise their rights, fulfill their obligations, and mediate their disagreements (UNDP, 1997). Therefore, improving the governance system's ethics, accountability, justice, and fairness is critical to the anti-corruption campaign. Moreover, in spite of rules and regulations in the governance system, the problem of corruption and unethical behavior cannot be resolved unless human commitment and good will, above all morality, are in place (Misra, 2016). According to Renn (2009), governance in general is a goal-oriented ethical concern that is management-focused. Therefore, corruption prevention is about all the features of good governance that are implemented in various agencies (OECD, 2008). Organizational culture is mainly shared beliefs and assumptions among constituents of the organization (Schein, 1985). Organizational culture is a normative construct of shared behavior guided by policies, procedures, and systems that guide the ethical actions and decisions of organizational members (Agarwal & Malloy, 1999). Moreover, the power of civil society is vital to the governance process.

Thus, strong integrity policies both in normative and structural approaches are needed in order to put into practice the power of civil society in the process of fighting corruption (Bruce, 2001). To be exact, promoting integrity in public administration means, applying norms, values, and ethical principles to the day-to-day operations of public service organizations in order to prevent unethical behavior and corruption. So, integrity is central to promoting good governance (Evans, 2012). In this connection, in the last two decades, corruption and its control have become a central agenda item in the debate on good governance (Fritzen & Basu, 2011).

When the term "governance" is preceded with the connotation "good", some value-assumptions and attributes such as efficiency, accountability, transparency, participation, rule of law, justice, and control of corruption are added to it (Drake, Malik, Xu, & Kotsioni, 2003). The recent concern for good governance and building public confidence in the administration has resulted in the need to adhere to moral and ethical principles that emphasize "fairness," "conscience," and moral clarity, and they give the idea a prominent place by admitting that officials are ultimately accountable to the people. In an effort to preserve high standards of moral and ethical behavior by public administrations, government organizations rely on a number of enforcement mechanisms, such as legal regulations, professional rules, codes of ethics, and ombudsmen, to monitor ethical standards (Misra, 2016). Strengthening institutions to promote good governance is the best strategy to prevent corruption in the public sector. In other words, strengthening the governance system means straightening moral and ethical values. Institutions must be free of interference and have autonomy in order to function effectively (Misra, 2016; Huberts, 2018). Independence and autonomy are most important to anti-corruption agencies.

On the other hand, the term "integrity violation" broadly encompasses various corrupt practices such as improper use of power and official information for private gain; potential conflicts of interest; favoritism and bribing; and terrorization and discrimination. As a result, acts that violate ethical values and norms are considered integrity violations. Integrity is becoming the central topic in governance and public policy making. This idea is crucial in understanding government ethics and corruption (Huberts, 2018). Because corruption involves misuse of power, nepotism, and favourism, which is against acceptable oral standards, norms, and values. Integrity identifies the acceptable standard of behavior from the opposite one. Therefore, the present position of multidisciplinary public governance studies warrants greater attention to "ethics and integrity" Moral values and norms are often lacking when academics describe, explain, and understand the reality of governance and administration. The predominant focus is on goals and interests; prejudice and irrationality; institutions; power and context. A change of ethics and integrity is required" in the prevailing fields of study." But also, for integrity and ethics researchers, standard scientific articles should be the center of attention. Moral values and norms are assumed to play a significant role in day-to-day politics and administration, and researchers, in this sense, are part of the ethics industry (Huberts, 2018).

Therefore, in the last couple of decades, anti-corruption campaigns and projects have comprised the elements of good governance by different organizations, ranging from international, national, and NGOs (Moroff & Schmidt-Pfister, 2010). Good governance and ethics policies share the following in common, i.e., fighting corruption, accountability and transparency, and participation of all stakeholders and citizens at large (Demmke & Moilanen, 2011). Therefore, organizations should focus on workplace policies that are intended to create employees who arrive on time day in and day out, do their job, work hard, strive to do the right thing, and often produce breakthroughs that promote the interests of the company (Renn, 2009). Good governance further involves processes, institutions, and effective mechanisms that serve the interests of citizens and ensure that citizens exercise their rights and obligations. In the process of governance, transparency, accountability, participation, and the rule of law are also essential for the governance system to be open and effective (Misra, 2016; Nabatchi, 2012).

More importantly, the phrase "good governance" is increasingly being used to call attention to the need for "governance" to operate according to the rule of law and, above all, in a corruption-free manner. Good governance is agreement-oriented, accountable, transparent, participatory, responsive, efficient, effective, fair, and inclusive, and it pursues the rule of law (Anello, 2008). Good governance is about enacting and implementing proper policies and procedures that guarantee ethical management as well as efficiency and effectiveness. More importantly, the goal of good governance is to minimize corruption by establishing an accountable and transparent system, sustaining the rule of law, and minimizing corruption (Anello, 2008). In other words, the art of "good governance" is to have adequate processes in place to prevent mistakes while promoting effective growth and innovation to realize the strategic goals of the organization. Procedures, processes, and rules are essential and valuable as long as they contribute to the general objectives described above. When rules start to undermine these goals, they quickly become obstacles to good governance (Renn, 2009). In this regard, Englebert (2002) defines good governance as a set of qualities including institutions, government accountability, and property rights stability free of corruption. When donors initiate the agenda of good governance, the aim is to place more focus on anti-corruption, accountability, and efficient governance (Randall & Theobald, 1998).

There has been much debate on good governance and integrity in relation to corruption and ethics. With advancements in technology, the concepts of governance and ethics are involved in the realm of digital ethics. There is also much to be said about digital governance, and even more to understand and theorize, but one thing is clear: digital governance is digital ethics, also known as information, computer, or data ethics (Floridi & Taddeo, 2016). The practice of developing and implementing policies, procedures, and standards for the proper development, use, and management of the information sphere is known as "digital governance" (Milakovich, 2012). It is also a matter of convention and good coordination, which are not always moral or immoral, legal or illegal. For example, through digital governance, a government agency or a company can (a) determine and control the processes and methods used by data stewards and custodians to improve the data quality, reliability, access, security, and availability of its services and (b) design effective decision-making and accountability procedures for data-related processes. (Florida, 2018). Furthermore, "digital governance" includes specific guidelines and recommendations for digital regulation. Furthermore, digital regulation includes a system of rules and legislation that apply and are elaborated and implemented through social or government institutions to regulate the behavior of related agents in the info-sphere. And compliance is an important link through which "digital regulation" shapes "digital governance" (Floridi, 2018). Digital ethics, as a branch of "ethics", studies and assesses moral issues related to data and information (including its generation, capture, preservation, processing, dissemination, sharing, and use), algorithms (including artificial intelligence, artificial assets, machine learning, and robots), and associated practices and infrastructure (including responsible innovation,

hacking, programming, and professional codes and standards) to formulate and support morally sound solutions (e.g., good behavior or good values). Therefore, "digital ethics shapes digital regulation and digital governance through the relationship of moral evaluation" (Floridi, 2018, pp. 1–7).

Corruption

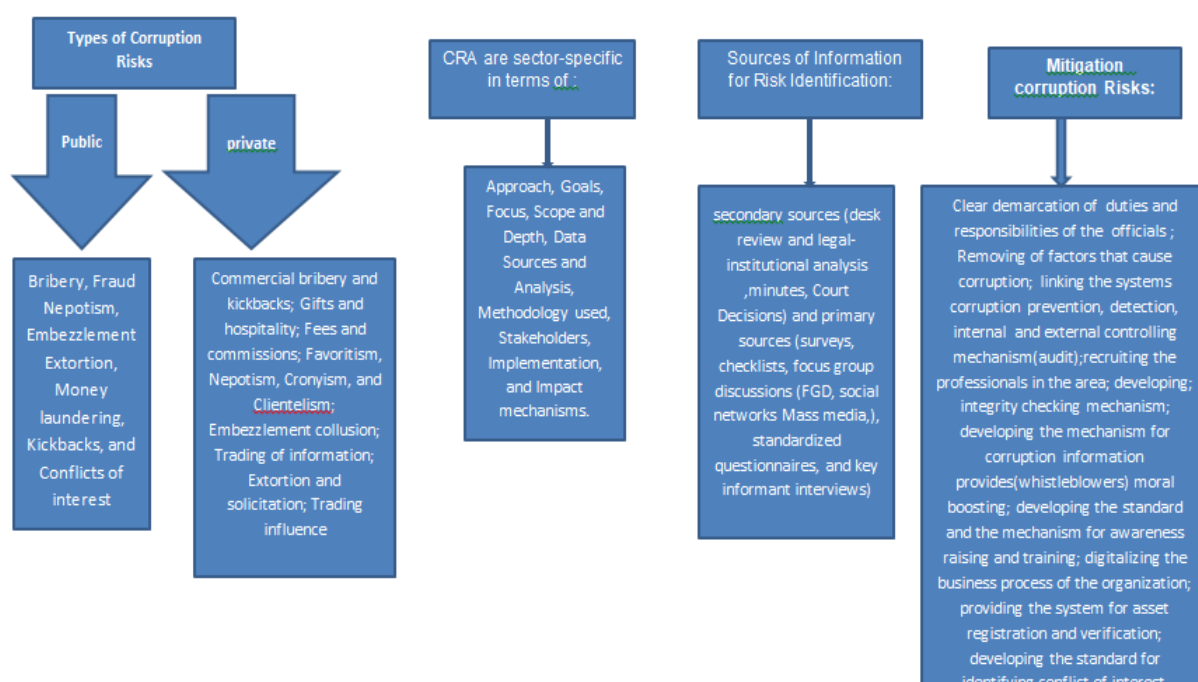
Since the 1990s, the conceptual landscape of corruption has changed. The international community agrees on the political, moral, and economic threats of corruption (Fritzen & Dobel, 2018). In general, the term "corruption" is defined as the abusing of public power (authority) for personal interests (Rothstein, 2011). Following the American 9/11 terrorist attack, the international community conceptualized corruption as a security issue, and corruption was also understood as an environmental danger through the depletion of natural resources and people smuggling (Shelley, 2014). The concept of corruption and corrupt acts are defined differently by various organizations, so it limits the efforts of anti-corruption advancement at the national level (Mungiu-Pippidi, 2016). Therefore, an inclusive definition for corruption and related offenses is crucial and timely. Moreover, understanding the prevailing determinants of corruption prior to anti-corruption strategy design is paramount (Veresha, 2018); in this regard, the most important determinant can be the culture of "government favoritism" (Doroftei, 2016), other "non-financial" aspects of corruption (Vargas & Schlutz, 2016), and "confidential criminal cases," for example, the September 11 terrorist attack in the US is also an act of corruption (Martin, 2017). Yet, as a general rule, deviating from accepted standards of behavior by public officials for private gain is corruption (Haque & Mohammad, 2013). Therefore, corruption is commonly defined as the misuse or abuse of power by public authorities for private interests (WB, 1997). Transparency International defines corruption as the improper and unlawful behaviors of public officials intended to enrich themselves (Haque & Mohammad, 2013).

The Types of Risks Organizations Face in Anti-Corruption Context

Even though the great majority of public employees carry out their work honestly, corruption is a possibility in all businesses and government establishments. There is always a possibility that a public official will commit corruption by abusing their unique abilities, knowledge, and access to information, whether through the granting of public contracts, the collecting of taxes or other revenues, the provision of social benefits, or any other way that a government interacts with its citizens. Similarly, people who deal with public authorities and government organizations may attempt to utilize corruption to influence or get around policies, guidelines, and decisions, among other things. Finding the points in an organization's operations where corruption is most likely to happen, creating and putting into practice strategies to stop it from happening again, and making sure that every employee acts honorably to fulfill the organization's mission are the challenges that most organizations face (UNODC, 2020).

Corruption risk assessment and management can improve service delivery to people that is impartial and objective, decrease loss of income, and protect the rule of law and law enforcement operations (UNODC, 2020).

Conceptual Framework



Source: Researchers Own Conceptualization, 2024

Research Methodology

To date, no standards have been developed outlining precise and thorough procedures to be followed while conducting corruption risk assessment, despite the significance and advantages of a risk-based approach and, in particular, corruption risk assessment, in the prevention of corruption. The Compliance and Technical Guide to UNCAC mentions corruption risk assessment as a necessary condition for the successful combat of corruption, but it does not provide a methodology. As a result, assessments are typically conducted as one-time tasks, each with a unique methodology framework, leading to significant variations in the terminology and methods used. Given this, developing a sound approach that can assess corruption risk in various settings while allowing for some flexibility to tailor the specifics of each exercise is crucial. In addition, the Standardized language and methodological decisions would be necessary for such an approach to establish common procedures among various national anti-corruption authorities as well as players inside a nation (Transparency International, 2019).

Therefore, this study used secondary sources of data (Documents). A document analysis can be a valuable source of information in qualitative research, and the analysis approach was content analysis; it included the documents are: UNDP, Methodology for Corruption Risk Assessment; Transparency International Hub, Corruption Risk Assessment Topic Guide World Custom Organization, Guide to Corruption Risk Assessment Mapping; Council of Europe, Rationale and outline of Corruption Risk Assessment; UNODC, A Guide on Conducting Corruption Risk Assessment in Public Organizations

Result and Discussion

A corruption risk assessment is typically used to supplement evidence of actual or perceived corruption in a given context in order to inform anti-corruption strategies and policies or for advocacy purposes. It can be applied at various levels, including government and its institutions, donor support programs, sectoral programs, and individual organizations or units. It can also be used as a starting point for anti-corruption efforts to monitor how risks evolve over time (Selinšek, 2013).

Creating "adequate procedures" for proper anti-corruption measures and a robust compliance program both depend on conducting a corruption risk assessment. Any anti-corruption compliance program that aims to "mitigate," or lower, a business's risk of liability for unlawful activity must include this. A corporation can ensure that it manages critical risks effectively by recognizing and assessing all of its corruption risks. After it is finished, efforts can be directed toward creating and putting into action policies that are designed to solve those issues. This is because no policies or processes can identify and prevent all bribery and achieve the goals of anti-corruption; instead, the institution and/or program must decide where to focus its compliance efforts given the limited resources available to it.

The Types of Corruption Risks the Public and Private Sectors Face

The most common forms of corruption in public sectors, according to the literature, are bribery, fraud nepotism, embezzlement extortion, money laundering, kickbacks, and conflicts of interest. On the other hand, commercial bribery and kickbacks; gifts and hospitality; fees and commissions; favoritism, nepotism, cronyism, and clientelism; embezzlement collusion; trading of information; extortion and solicitation; trading influence are most common in the private sector.

The Approaches to Sector- level Corruption Risk Assessment Standards

Anti-corruption initiatives tailored to a certain sector are strongly advised. The majority of CRAs typically take an institutional approach. The precise objectives, data and methodology employed, stakeholders, and effect mechanisms of CRAs, however, vary greatly. Thus, one of the main causes of the variety of techniques is the institutional setting and limitations faced by CRAs. Different public agencies that create and administer CRAs have varying degrees of authority to require centralized data collection and processing. The extent and breadth of a CRA are also determined by the institutional mandate, political limitations, and the accompanying resources allotted.

In terms of the methodology: There are three main approaches to assessing corruption risks: i) a centralized approach, known as a systematic assessment approach, mostly carried out by the auditors and other regulatory bodies such as anti-corruption agencies; ii) a decentralized approach, in this approach, the public or private sector carries out self-assessment; and iii) a transparency-oriented approach, its broad when we compare to other approaches and mostly conducted by NGO and civil society organizations.

In terms of the focus: mostly focus on corruption risks in laws and regulations; organizational policies. Others aim to identify corruption risks in policy implementation in specific issues such as human capital management, procurement, government subsidies, etc.

How Anti-corruption Agencies Identify the Potential Risks

To identify corruption risks, most of the time ACA's used both secondary sources (desk review and legal-institutional analysis, minutes, court decisions) and primary sources (surveys, checklists, focus group discussions (FGD, social networks, mass media), standardized questionnaires, and key informant interviews).

The ways of Dealing with Corruption Risks Mitigation

At this stage, the organizations deal with the identified potential risks that emanate from the corruption risk assessment (CRA) studies of their specific area. In this case, the leadership commitment is central in dealing with potential risks of corruption in the organization. The leader of the organization (public and private) must make the anti-corruption action part of your organization's business by adapting a zero-tolerance anti-corruption policy, including the legal ground in managing and preventing conflicts of interest. Furthermore, the leaders must provide training for the management and employees of the company on ethics and anti-corruption.

The leadership commitment is crucial in dealing with the threats of corruption. Both public and private organization leaders need to integrate anti-corruption measures into their business operations. This can be achieved by implementing a zero-tolerance anti-corruption strategy that covers all relevant legal aspects, including managing and preventing conflicts of interest. In addition, the company's executives are required to train the management and staff in ethics and anti-corruption.

The identification of certain actions targeted at removing or reducing the sources of corruption risks in the organization's operations is a necessary step in developing measures to reduce corruption risks. Some of the measures include: developing the standard operating procedure document during implementation. (it contain clear demarcation of duties and responsibilities of the officials; removing of factors that cause corruption; linking the systems of corruption prevention, detection, internal and external controlling mechanisms (audit); recruiting the professionals in the area; developing an integrity checking mechanism; developing the mechanism for corruption information provides whistleblowers) moral boosting; developing the standard and the mechanism for awareness raising and training; digitalizing the business process of the organization; providing the system for asset registration and verification; developing the standard for identifying conflict of interest.

Discussion

From the study analysis, we understand that the forms and types of corruption and its manifestations are different in the public and private sectors and even within the sectors, both public and private. In addition, the study found that there is no single standard for the CRA approach and methodology for all sectors, whether

private or public. Furthermore, the literatures witness that, no standards have been developed outlining precise and thorough procedures to be followed while conducting corruption risk assessment (Transparency International, 2019; Sharma et al., 2016). Therefore, the approach is mostly determined by the institutional environment for CRAs and their constraints. In this case, understanding the prevailing determinants of corruption prior to anti-corruption strategy design is paramount (Veresha, 2018); in this regard, the most important determinant can be the culture of "government favoritism" (Doroftei, 2016), other "non-financial" aspects of corruption (Vargas & Schlutz, 2016), and "confidential criminal cases (Martin, 2017).

Furthermore, based on the specific context, the organizations' environment and the level of the risk can set up the goals, focus, scope, and depth, data sources and analysis, methodology used, stakeholders, implementation, and impact mechanisms. At the risk identification stage, the data sources or sources of information for all institutions are both secondary data (desk review) and primary data sources.

At the mitigation of corruption risks stage, the organization's leaders' commitment is foundational for all successful implementation. The sources for corruption mitigation strategy are the CRA studies of the specific context. The strategy is composed of varying standards or mechanisms for eliminating or reducing corruption.

Conclusions and Recommendations

This section presents the study's conclusions and recommendations. To date, no standards have been developed outlining precise and thorough procedures to be followed while conducting corruption risk assessment. Therefore, there is a need for setting standard operating procedures for CRA studies for anti-corruption agencies, particularly the FEACC). Therefore, the study concludes that the types of corruption Risks are different in the public and private sectors and within the sectors, whether public or private, while the corruption risk assessment approach is different in terms of the methodology, focus, and context. Therefore, organizations need to set the standards for corruption risk assessment studies based on their own context. Here, the important thing is a better understanding of the context. To identify corruption risks, most of the time ACA's used both secondary sources (desk review and legal-institutional analysis, minutes, court decisions) and primary sources.

Finally, the effective implementation of corruption risk assessment and mitigation mostly depends on the leadership commitment, and the main strategy for the corruption risk mitigation plan contains the following: Developing the standard operating procedure document during implementation. (It contains clear demarcation of duties and responsibilities of the officials; removing of factors that cause corruption; linking the systems of corruption prevention, detection, and internal and external controlling mechanisms (audit); recruiting the professionals in the area; developing an integrity checking mechanism; developing the mechanism for corruption information provides whistleblowers with moral boosting; developing the standard and the mechanism for awareness raising and training; digitalizing the business process of the organization; providing the system for asset registration and verification; developing the standard for identifying conflict of interest

The study also recommends that any organizations (public and private) that conduct corruption risk assessments (CRA) should prepare the standards based on their own context (the methodology, focus, data sources, and analysis methods). In addition, at the final stage of the corruption risk assessment (CRA) study results, implementation, follow-up, and monitoring stage, the organization should design the strategy for corruption elimination based on specific findings.

Limitations, Recommendations, and Future Research

Academics have given relatively little thought to the function of corruption risk management; as a result, anticorruption practitioners have not had much theoretical assistance in the development of the instruments that are essential for anticorruption risk management. Therefore, the aim of this study was limited to evaluating the Standard Operating Procedures for Corruption Risk Assessment (CRA) studies in order to make appropriate recommendations on the corruption risk identification stage to the mitigation plan and implementation stage to the anti-corruption agencies. This study used secondary sources of data (documents), and the analysis approach was content analysis. It included UNDP, Methodology for Corruption Risk Assessment; Transparency International Hub, Corruption Risk Assessment Topic Guide; World Custom Organization, Guide to Corruption Risk Assessment Mapping; Council of Europe, Rationale and Outline of Corruption Risk Assessment; and UNODC, A Guide on Conducting Corruption Risk Assessment in Public Organizations.

In addition to the limitations declared in this research, further research will be needed on sector-specific standards for CRA, such as specific sector-focused approaches, methodologies, implementation standards, and monitoring standard operating procedures.

Reference

- Agarwal, J., & Malloy, D. C. (1999).** Ethical work climate dimensions in a not-for-profit organization: An empirical study. *Journal of Business Ethics*, 20(1), pp 1-14.
- Anello, E. (2008).** A framework for good governance in the public pharmaceutical sector. *World Health Organization, Department of Essential Medicines and Pharmaceutical Policies, Geneva*.
- Bhatta, G. (2008).** Public sector governance and risks: a proposed methodology to do risk assessments at the program level.
- Bruce, W. M. (2001).** *Classics of administrative ethics*: Westview Press.
- Brusca, I., Manes Rossi, F., & Aversano, N. (2018).** Accountability and transparency to fight against corruption: an international comparative analysis. *Journal of Comparative Policy Analysis: Research and Practice*, 20(5), pp 486-504.
- Council of Europe (2019).** Rationale and outline of a Corruption Risk Assessment Methodology
- Demmke, C., & Moilanen, S. T. (2011).** Effectiveness of Good Governance and Ethics in Central Administration: Evaluating Reform Outcomes.
- Doroftei, I. M. (2016).** Measuring government favoritism objectively: the case of Romanian public construction sector. *European Journal on Criminal Policy and Research*, 22(3), pp 399-413.
- Drake, E., Malik, A., Xu, Y., & Kotsioni, I. (2003).** Rasha El-Habashy and Vivek Misra. 2003. "Good Governance and the World Bank." Bretton Woods Project, London.
- Englebert, P. (2002).** *State legitimacy and development in Africa*: Lynne Rienner Publishers.
- Evans, M. (2012).** Beyond the integrity paradox—towards 'good enough' governance? *Policy Studies*, 33(1), pp 97-113.
- Floridi, L. (2018).** Soft ethics and the governance of the digital. *Philosophy & Technology*, 31(1), pp 1-8.
- Floridi, L., & Taddeo, M. (2016).** What is data ethics? *Philosophical Transactions of the Royal Society of London Series A*, 374(2083), 20160360.
- Fritzen, S. A., & Dobel, J. P. (2018).** Transforming Corrupt Systems: What Have We Learned? *Public Integrity*, 20(sup1), S60-S73.
- Fritzen, S. A., & Basu, S. (2011).** The strategic use of public information in anti-corruption agencies: evidence from the Asia-Pacific region. *International Journal of Public Administration*, 34(14), pp 893-904.
- Haque, S. T. M., & Mohammad, S. N. (2013).** Administrative culture and incidence of corruption in Bangladesh: A search for the potential linkage. *International Journal of Public Administration*, 36(13), pp 996-1006.
- Hijal-Moghrabi, I., & Sabharwal, M. (2018).** Ethics in American public administration: A response to a changing reality. *Public Integrity*, 20(5), pp 459-477.
- Huberts, L. W. (2018).** Integrity: What it is and Why it is Important. *Public Integrity*, 20(sup1), S18-S32.
- Kernaghan, K. (2003).** Integrating values into public service: The values statement as centerpiece. *Public administration review*, 63(6), pp 711-719.
- Kyiv (2024).** UNDP Methodology for corruption risk assessment
- Makowski, G. (2016).** Anti-corruption agencies-silver bullet against corruption or fifth wheel to a coach? analysis from the perspective of the constructivist theory of social problems. *Studia z polityki publicznej*, 11(3), pp 55-77.
- Martin, G. (2017).** Secrecy's corrupting influence on democratic principles and the rule of law. *International journal for crime, justice and social democracy*, 6(4), 100.
- McDevitt, A. (2011).** Corruption Risk Assessment Topic Guide. *International Transparency Retrieved from: https://knowledgehub.transparency.org/assets/uploads/kproducts/Corruption_Risk_Assessment_Topic_Guide.pdf*.
- Meagher, P. (2005).** Anti-corruption agencies: Rhetoric Versus reality. *The Journal of Policy Reform*, 8(1), pp 69-103.

- Milakovich, M. E. (2012).** *Digital governance: New technologies for improving public service and participation*. Routledge.
- Misra, S. (2003).** *Governance to good governance: are we committed to reforms*: Mittal Publications, New Delhi.
- Misra, S. (2016).** Strengthening of Ethical and Moral values in Governance.
- Moroff, H., & Schmidt-Pfister, D. (2010).** Anti-corruption movements, mechanisms, and machines—an introduction. *Global Crime*, 11(2), pp 89-98.
- Mungiu-Pippidi, A. (2016).** For a new generation of objective indicators in governance and corruption studies. *European Journal on Criminal Policy and Research*, 22(3), pp 363-367.
- Nabatchi, T. (2012).** An introduction to deliberative civic engagement. *Democracy in motion: Evaluating the practice and impact of deliberative civic engagement*, pp 3-17.
- OECD. (2008).** *Specialised Anti-Corruption Institutions: Review of Models*.
- Petkov, A. (2018).** Looking for consistency in corruption risk assessment: How key guidance materials stack up. *Rule of Law and Anti-Corruption Center Journal*, 2018(2), 8.
- Randall, V., & Theobald, R. (1998).** Political change and underdevelopment: A critical introduction to third world politics.
- Renn, O. (2009).** White Paper on risk governance: Towards and integrative approach: International Risk Governance Council (IRGC).
- Rothstein, B. (2011).** *The quality of government: Corruption, social trust, and inequality in international perspective*: University of Chicago Press.
- Schein, E. H. (1985).** Defining organizational culture. *Classics of organization theory*, 3(1), 490-502.
- Shakespeare, V. (2017).** Corruption Risk Assessment for Suriname. Paramaribo, Suriname: National Institute for Environment and Development in Suriname, REDD+ program.
- Sharma, S. K., Sengupta, A., Panja, S. C., & Nandi, T. (2016).** Corruption risk assessment methods: a review and future direction for organizations. *ELC Asia Pacific Journal of Finance and Risk Management*, 7(4), 1-44.
- Shelley, L. I. (2014).** *Dirty entanglements: Corruption, crime, and terrorism*: Cambridge University Press.
- Silva, S., Carvalho, M., & Belo, O. (20
- Selinšek, L. (2013).** Corruption Risk Assessment in Public Institutions in South East Europe. *Sciences*, 79(4), pp 644-651.
- Transparency International, Corruption Risk Assessment Topic Guide' in Gateway Corruption Assessment Toolbox. Available at:
http://gateway.transparency.org/files/uploads/Corruption_Risk_Assessment_Topic_Guide.pdf, last accessed on 11.09.2019.
- UNDP. (1997).** *Governance for sustainable human development*: UNDP.
- UNODC, (2020).** State of Integrity: A Guide on Conducting Corruption Risk Assessments in Public Organizations
- Vargas, G. A., & Schlutz, D. (2016).** Opening public officials' coffers: A quantitative analysis of the impact of financial disclosure regulation on national corruption levels. *European Journal on Criminal Policy and Research*, 22(3), pp 439-475.
- Veresha, R. (2018).** Corruption-related offences: Articulation of pervasive prevention mechanisms. *Journal of Legal, Ethical and Regulatory Issues*, 21(4), 1-12.
- WB. (1997).** Helping countries combat corruption: the role of the World Bank. *PREM NOTES*, April. Ppl-4.
- WCO (2011).** Guide to corruption risk assessment mapping.

Revisiting Financial Inclusion through Geographic and Demographic Penetration: A Cross Sectional District Level Study of Assam

Dr. Nitashree Barman

Assistant Professor, Department of Accountancy,
Pandit Deendayal Upadhyaya Adarsha Mahavidyalaya, Tulungia, Bongaigaon, Assam, India.

Abstract

This study examines the influence of banking service accessibility on financial inclusion in the state of Assam, focusing specifically on the geographical and demographic penetration of banking infrastructure across its 33 districts. Financial inclusion is a critical aspect of economic development, particularly in regions with diverse socio-economic characteristics. Assam, being the largest state in the North Eastern Region of India, presents a unique case for studying financial inclusion due to its geographic challenges and varying levels of economic development across districts. The study aims to estimate how the spatial distribution of banking services, in terms of branch and ATM density, impacts financial inclusion in the state. Using a cross-sectional analysis of data from the year 2021-22, the study employs OLS regression to assess the relationship between financial inclusion, measured as deposit accounts per capita, and the geographical and demographic spread of banking services. Geographic penetration is quantified using branch and ATM density per 1000 km², while demographic penetration is represented by branch and ATM density per 1000 population. The study tests two hypotheses: (1) the geographical penetration of banking services across districts in Assam has a significant relationship with the state's financial inclusion levels, and (2) the demographic penetration of banking services is significantly associated with financial inclusion. The results reveal that geographical penetration has a statistically significant positive effect on financial inclusion, suggesting that the physical availability of banking services across different areas is crucial for promoting financial access. Districts with a higher density of branches and ATMs per km², such as Kamrup Metro and Jorhat, consistently rank higher in terms of financial inclusion, indicating that a strong banking presence significantly enhances access to financial services. In contrast, demographic penetration does not show a statistically significant effect. This suggests that while the availability of banking infrastructure is essential, other demographic factors such as income levels, financial literacy, and digital banking access may also play a role in determining the actual utilization of banking services. The findings highlight the importance of enhancing the geographical spread of banking services to achieve greater financial inclusion in Assam. Policymakers should prioritize the expansion of physical banking infrastructure in underserved districts, particularly in areas like Goalpara and Dima Hasao, which rank low in both geographic penetration and financial inclusion. While the demographic dimension of banking penetration may not have a direct significant impact, it remains an area for further exploration, as improving financial literacy and promoting digital financial services could complement efforts to boost financial inclusion.

Keywords: Financial Inclusion, Assam, Geographic and Demographic Penetration, Branch and ATM Density

Introduction

Recently, the importance of addressing the banking needs of marginalised and economically disadvantaged populations has become more prominent (Ozili, 2021). Financial inclusion, which originated in 1993, contrasts with financial exclusion, which obstructs the access of vulnerable social groups to formal financial systems (Veena, 2022). Financial inclusion involves the provision of reasonable and timely banking products and services to both individuals and business concerns, playing a crucial role in economic growth, eradicating poverty, and maintaining financial stability. Achieving greater financial inclusion requires implementing measures, such as broadening digital financial services, creating tailored products or services for disadvantaged communities, and enhancing financial literacy through educational and awareness initiatives. Financial inclusion disparities between men and women are noteworthy on a global scale with significant discrepancies in access levels (Deléchat et al., 2018). Enhancing financial inclusion is a complex undertaking that necessitates considering the multiple changes occurring in the realms of economics, societal patterns, and politics (Siano et al., 2020). The current literature largely focuses on financial inclusion, which is mainly supported by institutions such as banks, rather than investigating alternative approaches (Khera et al., 2022). Financial inclusion encompasses not only its economic ramifications, but also serves as a socioeconomic principle that contributes to improved living standards through access to education, healthcare facilities, and overall security (Menon, 2019).

Research on financial inclusion has been conducted extensively in India to gain a deeper understanding of the concept. Although considerable progress has been made towards universal financial inclusion, India's diverse landscape necessitates the development of innovative models to accelerate this process and promote economic growth (Barik & Sharma, 2019). Policymakers have formulated diverse definitions for financial inclusion, and in the last ten years, they have put forth policy frameworks aimed at realising this objective (Sharma et al., 2020). Financial inclusion is a vital element for the financial industry's overall growth, especially in developing economies like India, where it is a crucial aspect of the broader financial sector's development (Lenka, 2021). Different methods of obtaining and utilising financial services can be used to evaluate the extent to which individuals have access to, and derive benefits from, these services (Gerald et al., 2022). Moreover, progress in online financial services has greatly accelerated efforts towards achieving financial inclusion (Shen, 2022).

In recent years, Indian policymakers and financial regulators have rolled out a series of initiatives to enhance financial inclusion. For instance, Pradhan Mantri Jan Dhan Yojana was introduced in 2014 to provide comprehensive banking services, while Small Finance Banks were granted differentiated licences w.e.f. 2015. In 2019, the National Strategy for Financial Inclusion was launched, with a goal of achieving universal inclusion by 2024. Additionally, the Business Correspondent model was adopted to extend services to remote areas, and the Financial Inclusion Index was implemented in 2021 to measure the effectiveness of inclusion efforts. Moreover, technology, particularly UIDAI Aadhaar, has been integrated to improve the accessibility to financial services. These initiatives demonstrate a well-rounded strategy that leverages regulatory frameworks, targeted programs, and technological advancements to expand financial access and promote economic inclusivity.

Literature Review

The effects of financial inclusion on economic growth, poverty alleviation, and disparity have been extensively studied in India, with a multitude of factors and outcomes examined for the purpose of policy formulation. Some of these previous studies conducted on the phenomenon are reviewed as follows:

Saha and Alam (2022) revisited the idea of financial inclusion as it relates to human development, uncovering a volatile pattern that highlights the necessity for ongoing efforts to integrate financial inclusion with broader development goals. Nautiyal and Ismail (2022) concluded that solely augmenting literacy rates and investment awareness may not be adequate to propel financial inclusion and emphasised the role of branch density in shaping financial inclusion.

Sharma (2016) conducted a study that unveiled an exclusive financial inclusion index designed specifically for analysing the different states of India. This index offers a comprehensive perspective on the correlation between financial inclusion and economic development. Barik and Sharma (2019) investigated the development and possibilities of financial inclusion in India, highlighting the improvements that have been made in this area across various states in India between 2001 and 2014. According to Iqbal and Sami (2017), bank and government interventions are crucial for promoting financial inclusion in India, which is essential for achieving sustainable economic growth. They also emphasised the need for state-level policy measures to support this effort. Singh and Yadava (2021) assessed the level of technical efficiency related to financial inclusion, while also examining its association with human development indicators in various Indian states. Their study revealed that states with higher human development indices generally exhibit a more favourable standing when it comes to financial inclusion. Sethy (2015) formulated a Financial Inclusion Index, which classifies India's financial inclusion landscape into distinct time periods and dimensions.

Maity and Sahu (2021) found that Assam had a distinct financial inclusion landscape that differed significantly from that of the rest of India. In a similar vein, Dar and Ahmed (2020) investigated the factors that influence financial inclusion in remote regions, such as Assam, and offer significant insights into the determinants of financial inclusion in this particular area. Additionally, Das et al. (2021) further examined the lower Brahmaputra Valley of Assam, uncovering repayment determinants, offering insights into financial behaviours, and access to credit in this region.

Based on the aforesaid information, it is evident that there is a dearth of research at the district level in Assam. Additionally, there have been no investigations carried out thus far to analyze how geographic and demographic factors affect the accessibility of banking services across various districts within the state. Assam is the largest state in the North Eastern Region, with a population of 31,205,576 and an area of 78,438 km², making it the second largest state in terms of size.

The northern part of the state is bordered by Bhutan and Arunachal Pradesh, whereas the eastern part is bordered by Nagaland, Arunachal Pradesh, and Manipur. Additionally, it shares its southern border with Meghalaya, Tripura, Mizoram, and Bangladesh, and its western border with West Bengal. The present study seeks to address the lack of information in the existing literature.

Objectives of the Study

- To analyse the financial inclusion, geographic, and demographic penetration of banking services across the districts of Assam.
- To estimate the effects of the geographic and demographic spread of banking services on financial inclusion within the state of Assam.

Hypotheses of the Study

The study proposes that extent to which banking services are accessible across the districts of Assam in terms of their geographical and demographic penetration has a significant impact on the state's financial inclusion. Based on this proposition, the study aims to test the following hypotheses:

H1: The geographical penetration of banking services across districts in Assam has a significant relationship with the state's financial inclusion levels.

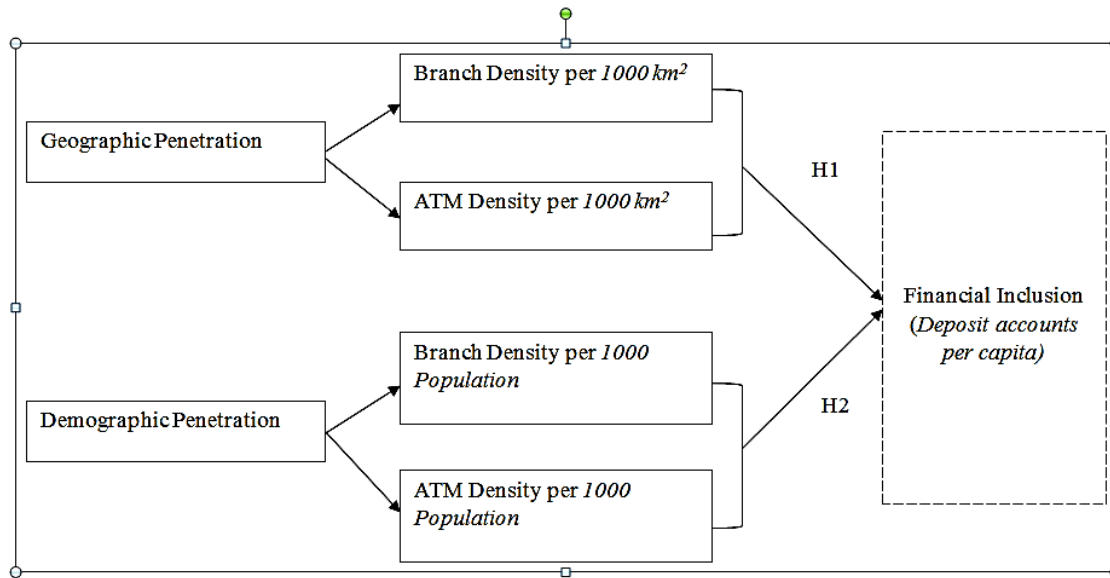
H2: The demographic penetration of banking services across districts in Assam is significantly associated with the state's financial inclusion levels.

Conceptual Framework

The study is built around the idea that financial inclusion is driven by the accessibility of formal banking services. In this context, the penetration of banking infrastructure, which is both geographically and demographically, plays a crucial role. Thus, the conceptual framework underpinning the role of banking infrastructure penetration in enhancing financial inclusion is grounded in access theory, which posits that availability and accessibility of financial services are critical determinants of inclusive growth. For example, according to Beck and Demirgüç-Kunt (2008), financial inclusion is essential for poverty reduction and economic growth, particularly in low- and middle-income countries. Increased access to financial services empowers individuals to save, invest, and manage risks, which in turn fosters economic development and reduces inequality. Furthermore, the theory of spatial economics (Krugman, 1991) suggests that the physical distribution of services, such as banking infrastructure, is a critical determinant of service accessibility. In regions where the geographical spread of services is limited, people face greater obstacles in accessing these services, leading to lower levels of financial inclusion. Concisely, it can be stated that geographical and demographic penetration serve as twin pillars that directly influence how well financial services are distributed and utilized across different regions and population groups. Geographic penetration refers to the number of bank branches relative to land area, whereas demographic penetration measures the number of branches relative to the population size (Maity & Sahu, 2021; Maity, 2019).

Moreover, Geographical penetration refers to the spatial distribution of financial infrastructure, such as bank branches, ATMs, and digital banking facilities, relative to the population's location. According to the spatial mismatch hypothesis, physical distance between financial service providers and potential users acts as a key barrier to inclusion, particularly in underserved and remote regions. The greater the concentration of banking infrastructure across districts, the more likely individuals are to access and utilize formal financial services, reducing the reliance on informal lending systems. Studies have shown that regions with higher geographical penetration tend to have better access to financial services, driving deeper integration into the formal economy (Beck et al., 2007). On the other hand, demographic penetration focuses on ensuring that banking services are equitably accessible to various population segments, especially marginalized groups such as women, rural households, and low-income populations. Demographic penetration addresses the socio-economic barriers that inhibit access, even in regions with a strong geographic banking presence. For example, women and rural populations often face cultural, informational, and economic barriers that prevent them from fully engaging with formal financial institutions (Demirgüç-Kunt & Klapper, 2012). By designing banking services that are tailored to the needs of these groups—through initiatives like mobile banking, microfinance, and simplified account opening processes—demographic penetration ensures that financial services reach beyond the urban, male-dominated segments, thus promoting a more inclusive financial system. Together, geographical and demographic penetration synergistically enhance financial inclusion. While geographical infrastructure expands physical access, demographic-oriented strategies help overcome socio-cultural and economic impediments. This dual approach increases both the reach and usage of banking services, driving financial inclusion, which in turn fosters economic participation, poverty reduction, and social equity (Cull et al., 2014). Having this backdrop, the present study is based on the following conceptual model (Figure 1):

Figure 1: Conceptual Model



Source : Author's Own Conceptualisation

Database and Methodology

The study relies on quantitative data sourced from the Statistical Handbook of Assam and the RBI database. For the cross-sectional analysis of 2021-22, data has been collected from all 33 districts in Assam. To accomplish the initial objective, rankings are utilized to facilitate comparisons between the districts. For attaining the second objective, OLS regression is used, contingent upon satisfying the assumptions of the estimation model. To assess heteroskedasticity, autocorrelation, and multicollinearity, the study has used the Breusch-Pagan-Godfrey Heteroskedasticity Test, Durbin Watson Statistic, and Variance Inflation Index (VIF), respectively.

In addition, the study uses deposit accounts per capita as a proxy for defining financial inclusion. The extent of geographic and demographic coverage is assessed using branch and ATM density. To assess the geographic penetration of banking services, the study uses branch density per 1000 km² and ATM density per 1000 km² as proxies, while demographic penetration is assessed using branch density per 1000 population and ATM density per 1000 population. Financial inclusion is regarded as the dependent variable in the estimation model, which is regressed against independent variables, including geographic and demographic banking service penetration, in terms of branch and ATM density parameters.

The relationship between financial inclusion and the penetration of banking services can initially be modelled as:

$$Financial\ Inclusion_i = \beta_0 + \beta_1 Geographic\ Penetration_i + \beta_2 Demographic\ Penetration_i + \varepsilon_i \dots \dots \dots Eq. 1$$

Where, *Financial Inclusion_i* indicates the extent of financial inclusion in the *i*th district; *Geographic Penetration_i* and *Demographic Penetration_i* are the independent variables in the *i*th district; β_0 indicates the intercept term; β_1 and β_2 are the coefficients associated with the respective independent variables, reflecting the influence of geographic and demographic penetration on financial inclusion; ε_i is the error term.

The above equation can further be refined by incorporating branch and ATM density as specific measures of geographic and demographic penetration, leading to the following two formulations:

$$\text{Financial Inclusion}_i = \beta_0 + \beta_1 \text{Branch Density per 1000 km}^2_i + \beta_2 \text{Branch Density per 1000 population}_i + \varepsilon_i \dots \text{Eq. 1.1}$$

Eq. 1.1 evaluates the impact of branch density on financial inclusion in the i^{th} district; β_1 represents the influence of the number of bank branches per 1000 km² (a measure of geographical penetration), while β_2 represents the effect of the number of branches per 1000 population (a measure of demographic penetration).

$$\text{Financial Inclusion}_i = \beta_0 + \beta_1 \text{ATM Density per 1000 km}^2_i + \beta_2 \text{ATM Density per 1000 population}_i + \varepsilon_i \dots \dots \text{Eq. 1.2}$$

Eq. 1.2 assesses how ATM density influences financial inclusion in the i^{th} district; β_1 measures the effect of the number of ATMs per 1000 km² (geographic penetration), while β_2 captures the effect of ATMs per 1000 population (demographic penetration).

Results and Discussion

Financial Inclusion through Geographic and Demographic Penetration: Comparison across the Districts of Assam

When analysing the rankings of the districts based on the variables such as deposit account per capita, branch density per 1000 km² and per 1000 population, and ATM density per 1000 km² and per 1000 population, it is observed that certain districts consistently performed well, while others show varied performance across these metrics (as depicted in Table 1).

Kamrup Metro is found to be the most prominent district in terms of banking infrastructure and financial access, consistently achieving the 1st rank in respect of all the variables. This suggests that residents of the district have the highest level of access to banking services, both in terms of physical banking locations and availability of banking accounts relative to the population. Jorhat follows closely behind, securing the 2nd rank in all the parameters, indicating a strong financial infrastructure that supports its residents' banking needs. This high ranking of the district points to its comprehensive banking coverage and availability of financial services to its population. Nagaon, while securing the 3rd rank in deposit account per capita and branch density per 1000 km², shows a lower ranking in ATM density per 1000 km², where it falls to the 6th position. This result may suggest a relative imbalance in the distribution of ATMs compared to branches, which could affect the convenience of residents' cash access. Sivasagar and Dibrugarh also demonstrate strong banking networks, with Sivasagar consistently ranking in the top four and Dibrugarh achieving high ranks, particularly in deposit account per capita and branch density per 1000 km². These rankings reflect the well-established banking presence in these districts, which likely contributes to higher levels of financial inclusion. Golaghat, while not leading, still performs well, securing ranks within the top 10 for deposit account per capita and branch density per 1000 km², but it ranks lower in ATM density per 1000 km² in the 21st position. This indicates that, while the district has a good number of bank accounts and branches relative to its population, the availability of ATMs may not be as widespread. Conversely, districts such as Goalpara, Dima Hasao, and West Karbi Anglong rank at the bottom, suggesting that these areas have less access to banking services and could be the focus of financial inclusion efforts to improve banking infrastructure and access.

Thus, it can be stated from above that the above rankings provide a comprehensive view of the financial inclusion across the districts of Assam. This highlights the clear divergence in banking infrastructure and access to financial services among the districts. Kamrup Metro, as a leading district, exemplifies the ideal scenario with a high density of branches and ATMs, both per km² and per capita, which aligns with its top rank in deposit accounts per capita. This indicates not only a strong physical banking presence but also a high level of financial engagement among its residents. Jorhat's consistently high rankings across multiple parameters suggest that it has a similarly robust banking infrastructure, ensuring that a majority of its population has reasonable access to financial services. This is indicative of a well-developed banking sector capable of meeting the needs of its residents. By contrast, districts such as Goalpara, Dima Hasao, and West Karbi Anglong, which rank lower in these categories, face significant challenges in terms of financial inclusion. The lower rankings in both physical banking infrastructure and deposit accounts per capita indicate the need for targeted interventions to enhance the availability and accessibility of financial services in these regions. The disparities revealed by the rankings highlight the importance of a targeted approach to financial development, ensuring that all regions, especially those currently underserved, can benefit from improved access to banking. This could involve the expansion of

physical banking outlets, introduction of mobile banking units, or promotion of digital banking services to bridge the gap in areas with less banking infrastructure.

Table 1: District Wise Rank Based on Variables Used in the Estimation

District	Financial Inclusion	Geographic Penetration		Demographic Penetration	
	Deposit Account per capita	Branch Density per 1000 km ²	ATM Density per 1000 km ²	Branch Density per 1000 population	ATM Density per 1000 population
Baksa	27	26	28	29	30
Barpeta	12	10	11	22	22
Biswanath	25	23	20	17	14
Bongaigaon	19	7	3	16	7
Cachar	18	12	10	10	10
Charaideo	26	22	25	23	27
Chirang	20	27	27	25	21
Darrang	10	14	12	19	17
Dhemaji	7	29	24	26	6
Dhuburi	16	8	14	30	28
Dibrugarh	5	6	7	3	3
Dima Hasao	30	33	32	5	15
Goalpara	33	18	19	27	25
Golaghat	6	19	21	7	11
Hailakandi	22	20	13	24	12
Hojai	28	21	17	32	26
Jorhat	2	2	2	2	2
Kamrup	9	9	8	8	9
Kamrup Metro	1	1	1	1	1
Karbi Anglong	31	31	31	12	29
Karimganj	23	11	15	21	24
Kokrajhar	21	28	26	28	20
Lakhimpur	15	16	18	15	18
Majuli	24	30	29	14	19
Morigaon	8	13	23	20	31
Nagaon	3	4	6	13	16
Nalbari	11	3	5	9	13
Sivasagar	4	5	4	4	4
Sonitpur	14	17	9	11	5
South Salmara	29	25	30	33	33
Tinsukia	13	15	16	6	8
Udalguri	17	24	22	31	23
West Karbi Anglong	32	32	33	18	32
Source: Author's Analysis					

Estimation Result of the Effects of the Geographic and Demographic Spread of Banking Services on Financial Inclusion within the State of Assam

The Breusch-Pagan-Godfrey test, as reported in Table 2, which is conducted on the models assessing the branch and ATM density functions, yields F-statistic values of 0.249723 ($R^2 = 0.016376$) and 0.261155 ($R^2 = 0.017112$), respectively. Both F-values are found to be statistically significant at the 5% significance level ($\alpha = 0.05$). The coefficients of the independent variables in both the models are also examined. For the first model, the coefficient values of Geographic Penetration ($\beta = 0.018521$, standard error = 0.203619) and Demographic Penetration ($\beta = -0.256571$, standard error = 0.378782) are both deemed insignificant at $\alpha = 0.05$. Similarly, for the second model, the coefficient values of Geographic Penetration ($\beta = 0.098377$, standard error = 0.208115) and Demographic Penetration ($\beta = -0.230753$, standard error = 0.308868) are also found to be insignificant. These test results indicate that heteroscedasticity is absent in either model. Thus, both the models exhibit homoscedasticity. Furthermore, assessments for multicollinearity and autocorrelation reveal that the models are free from these issues, as the mean VIF for the proxies of Geographic and Demographic Penetration is 1.36 for Model 1.1 and 2.26 for Model 1.2. The values for both models are significantly lower than the commonly employed cutoff of 10, suggesting that multicollinearity is not a concern for these models. Moreover, the Durbin-Watson statistic values for both models are approximately equal to 2. This result suggests that autocorrelation is not an issue because values close to 2 indicate no autocorrelation. Thus, the diagnostic tests performed on the two models assessing the branch and ATM density functions indicate that the models are well specified. The results of the tests for heteroscedasticity, multicollinearity, and autocorrelation indicate that the models are not affected by these common problems, which further validates the suitability of the estimation models.

Table 2: Diagnostic Result of Estimation Models

		Model 1.1_Branch Density	Model 1.2_ATM Density
Heteroskedasticity Test: Breusch-Pagan-Godfrey	Constant	-0.507055 (1.454077)	-0.720164 (1.395826)
	Geographic Penetration	0.018521 (0.203619)	0.098377 (0.208115)
	Demographic Penetration	-0.256571 (0.378782)	-0.230753 (0.308868)
	R^2	0.016376	0.017112
	F-statistic	0.249723*	0.261155*
Autocorrelation	Durbin-Watson	1.995617	2.074433
Multicollinearity	Mean VIF	1.36	2.26

Note: * indicates significant at 0.05 level

Source: Author's Analysis

Table 3 provides OLS estimation results and shows that the F-statistic values for Model 1.1 (Branch Density) and Model 1.2 (ATM Density) are 6.342657 and 8.141710, respectively, with R-squared values of 0.297182 and 0.351820, respectively. These values are significant at the 5% level, suggesting that the models have a good fit, and that the independent variables explain a reasonable proportion of the variance in financial inclusion.

In the first model, the coefficient associated with geographic penetration is 0.286249, accompanied by a standard error of 0.110303. Similarly, the coefficient pertaining to demographic penetration is 0.198252, with a standard error of 0.205192. The positive coefficients indicate that increases in both geographic and demographic penetration are associated with increases in financial inclusion. The impact of geographic penetration is significant, but the impact of demographic penetration is not significant at the 5% level ($\alpha = 0.05$). The second model reinforces the positive relationship between geographic and demographic penetration, and financial inclusion. The coefficient of geographic penetration in this model is also significant at the 5% level, further supporting the notion that geographic factors play a role in financial inclusion. These results provide evidence to accept H1, which states that the geographical penetration of banking services across districts in Assam has a significant relationship with the state's financial inclusion levels. However, the results lead to the rejection of H2, which posited that the demographic penetration of banking services across districts in Assam is significantly associated with the state's financial inclusion levels.

Table 3: OLS Estimation Result

Variable	Model 1.1_Branch Density		Model 1.2_ATM Density	
	Coefficient	Standard Error	Coefficient	Standard Error
Constant	-0.190285	0.787695	-0.291722	0.714475
Geographic Penetration	0.286249*	0.110303	0.239791*	0.106527
Demographic Penetration	0.198252	0.205192	0.111149	0.158098
R ²	0.297182		0.351820	
F-statistic	6.342657*		8.141710*	

Note: * indicates significant at 0.05 level

Source: Author's Analysis

Thus, the findings from the OLS regression models indicate that both geographic and demographic penetrations are positively associated with financial inclusion in Assam. Further, the outcomes imply that any initiatives aimed at increasing financial inclusion in Assam should consider both geographic and demographic factors, with a focus on improving the ease of access to financial services and addressing demographic factors that may impact financial inclusion.

Conclusion

The study finds that while some districts in Assam enjoy a high level of banking access and financial inclusion, others lag behind, indicating the need for continued efforts to promote equitable financial access and foster economic growth and stability across all districts of the state during the study period 2021-22. Further, the estimation results show that geographic penetration, as measured by branch density per 1000 km² and ATM density per 1000 km², has had a notable impact on the progress of financial inclusivity at the state level. This finding indicates that the physical presence of banking services is a key contributor to financial accessibility. However, the study also reveals that demographic penetration, represented by branch density per 1000 population and ATM density per 1000 population, has a positive but not statistically significant impact. This implies that despite the availability of banking services, there remains an underserved segment of the population across the various districts in Assam. The conclusion that can be drawn from the research hypothesis on the accessibility of banking services across the districts of Assam in terms of their geographical and demographic penetration is that it has a significant effect on financial inclusion in the state. Thus, it can be inferred that the hypothesis of the study is accepted concerning the geographic penetration of banking services, but not about the demographic penetration of banking services.

Recommendation and Future Scope of Study

Based on the above insights, it is suggested that policymakers need to focus on enhancing demographic penetration to ensure that financial inclusion efforts reach all sections of the population. This could involve targeted strategies to address the specific needs of underserved communities, thereby promoting equitable access to financial services across the state.

The objective of this research is to concentrate exclusively on the issue of accessibility in the context of financial inclusion. Further studies may expand the scope by delving into other dimensions, namely availability and usage. Further research can be conducted by considering a wider perspective that encompasses all districts across the country, which would offer a complete understanding of financial inclusion, extending beyond just access. This holistic approach would enable a more comprehension of the various facets of financial inclusion.

References

- Barik, R. & Sharma, P. (2019)** 'Analyzing the progress and prospects of financial inclusion in India', *Journal of Public Affairs*, 19(4). <https://doi.org/10.1002/pa.1948..>
- Beck, T. & Demirgüç-Kunt, A. (2008)** 'Access to finance: An unfinished agenda', *The World Bank Economic Review*, 22(3), pp.383-396. <https://doi.org/10.1093/wber/lhn021>
- Beck, T., Demirgüç-Kunt, A. & Martinez Peria, M.S. (2007)** 'Reaching out: Access to and use of banking services across countries', *Journal of Financial Economics*, 85(1), pp.234-266. <https://doi.org/10.1016/j.jfineco.2006.07.002>
- Cull, R., Ehrbeck, T. & Holle, N. (2014)** 'Financial inclusion and development: Recent impact evidence', CGAP Focus Note, 92. <https://www.cgap.org/sites/default/files/FocusNote-Financial-Inclusion-and-Development-April-2014.pdf>
- Dar, A. & Ahmed, F. (2020)** 'Financial inclusion determinants and impediments in India: Insights from the global financial inclusion index', *Journal of Financial Economic Policy*, 13(3), pp. 391-408. <https://doi.org/10.1108/jfep-11-2019-0227>.
- Das, T., Guha, P. & Das, D. (2021)** 'Do the heterogeneous determinants of repayment affect differently across borrowers of diverse credit sources in rural Assam? A double hurdle approach', *Journal of Development Policy and Practice*, 6(2), pp. 188-209. <https://doi.org/10.1177/24551333211031667>.
- Deléchat, C.C., Newiak, M., Xu, R., Yang, F. & Aslan, G. (2018)** 'What is driving women's financial inclusion across countries?', *IMF Working Paper*, 18(38), pp. 1-30. <https://doi.org/10.5089/9781484344460.001>.
- Demirgüç-Kunt, A. & Klapper, L. (2012)** 'Measuring financial inclusion: The Global Findex Database', *World Bank Policy Research Working Paper No. 6025*. <https://openknowledge.worldbank.org/server/api/core/bitstreams/9d6c7224-89a3-5cf5-82e6-ebfa5786415a/content>
- Geraldes, H., Gama, A. & Augusto, M. (2022)** 'Reaching financial inclusion: Necessary and sufficient conditions', *Social Indicators Research*, 162(2), pp. 599-617. <https://doi.org/10.1007/s11205-021-02850-0>.
- Iqbal, B. & Sami, S. (2017)** 'Role of banks in financial inclusion in India', *Contaduría Y Administración*, 62(2), pp. 644-656. <https://doi.org/10.1016/j.cya.2017.01.007>.
- Khera, P., Ng, S., Ogawa, S. & Sahay, R. (2022)** 'Measuring digital financial inclusion in emerging market and developing economies: A new index', *Asian Economic Policy Review*, 17(2), pp. 213-230. <https://doi.org/10.1111/aep.12377>.
- Krugman, P. (1991)** *Geography and Trade*. Cambridge, MA: MIT Press.
- Lenka, S.K. (2021)** 'Relationship between financial inclusion and financial development in India: Is there any link?', *Journal of Public Affairs*, 22(S1). <https://doi.org/10.1002/pa.2722>.
- Maity, S. & Sahu, T. (2021)** 'Financial inclusion in north-eastern region: An investigation in the state of Assam', *Vilakshan- XIMB Journal of Management*, 19(2), pp. 206-221. <https://doi.org/10.1108/xjm-09-2020-0118>.
- Maity, S. (2019)** 'A study on regional disparity of bank performance towards financial inclusion', *Management Today*, 9(1), pp.24-31. <https://doi.org/10.11127/gmt.2019.03.04>
- Menon, P. (2019)** 'Financial inclusion, banking the unbanked: Concepts, issues, and policies for India', *Journal of Public Affairs*, 19(2). <https://doi.org/10.1002/pa.1911>.
- Nautiyal, T. & Ismail, S. (2022)** 'Financial inclusion in India: A regional and district level analysis', *Asian Journal of Economics Business and Accounting*, 22(22), pp. 280-290. <https://doi.org/10.9734/ajeaba/2022/v22i2230732>.
- Ozili, P. (2021)** 'Measuring financial inclusion and financial exclusion', *SSRN Electronic Journal*, pp. 1-18. <https://doi.org/10.2139/ssrn.3769847>.

- Saha, D. & Alam, R. (2022)** 'Revisiting financial inclusion with human development in India', *Indian Journal of Human Development*, 16(3), pp. 548-577. <https://doi.org/10.1177/09737030221146018>.
- Sethy, S. (2015)** 'Developing a financial inclusion index and inclusive growth in India', *The Indian Economic Journal*, 63(2), pp. 283-311. <https://doi.org/10.1177/0019466220150210>.
- Sharma, D. (2016)** 'Nexus between financial inclusion and economic growth', *Journal of Financial Economic Policy*, 8(1), pp. 13-36. <https://doi.org/10.1108/jfep-01-2015-0004>.
- Sharma, D., Sinha, M. & Sheorey, P. (2020)** 'Can policymakers push financial inclusion through mobile telephony? A qualitative inquiry among Indian "urban poor" during demonetization', *Journal of Public Affairs*, 21(2). <https://doi.org/10.1002/pa.2451>.
- Shen, Y. (2022)** 'Comment on measuring digital financial inclusion in emerging market and developing economies: A new index', *Asian Economic Policy Review*, 17(2), pp. 231-232. <https://doi.org/10.1111/aepr.12387>.
- Siano, A., Raimi, L., Palazzo, M. & Panait, M. (2020)** 'Mobile banking: An innovative solution for increasing financial inclusion in Sub-Saharan African countries: Evidence from Nigeria', *Sustainability*, 12(23), pp. 1-24. <https://doi.org/10.3390/su122310130>.
- Singh, B. & Yadava, A. (2021)** 'Technical efficiency of financial inclusion and human development: Insights from the Indian states', *Economic Notes*, 51(2). <https://doi.org/10.1111/ecno.12199>.
- Veena, M. (2022)** 'Conceptual evolution of financial inclusion', *EPRA International Journal of Economic and Business Review*, 10(7), pp. 1-7. <https://doi.org/10.36713/epra10762>.

Design and Study of Integrated Desiccant Dehumidification and Vapour Compression for Energy-Efficient Air Conditioning System

Mr. Siddharth Rath

Ph. D. Research Scholar

Department of Chemical Engineering

Indian Institute of Technology, Bombay (IIT – B), India

Abstract

Energy efficiency and energy conservation are the two significant aspects considered while designing an air conditioning system. Conventional vapour compression air conditioning systems (VCAs) are considered energy-intensive devices, which motivates to stimulate the research towards the energy-efficient air conditioning system, especially for hot and humid climatic conditions. The temperature-independent humidity control through liquid desiccant material provides a substantial impact on minimizing energy shortages and reduces environmental problems without compromising human thermal comfort. In this perspective, efforts are devoted in the present study to integrate the two technologies of desiccant dehumidification and vapour compression air conditioning system. A mathematical model is developed for the dehumidifier/ regenerator module in 'Aspen Plus® V8.8' software with governing equations of energy, mass and species balance. The model predictions are compared with the available published experimental datasets, and noticed a good agreement exists between them with maximum errors of $\pm 4.9\%$ and $\pm 8.9\%$ for condensation and evaporation rate, respectively. Subsequently, the dehumidification system is integrated with a VCAs of small capacity to investigate the overall system performance, typically for hot and humid climatic conditions. A detailed parametric analysis is carried out to investigate the influence of design parameters (air temperature, desiccant temperature, desiccant concentration and solution and air flow rates) on performance parameters (energetic coefficient of performance, humidity removal rate and system effectiveness of dehumidifier and evaporation rate of regenerator). Further, the performance comparison of such an integrated system with the standalone VCAs is also studied in detail. The comparative results revealed that the overall COP of the integrated system is improved compared to the standalone VCAs at which a significant amount of the total latent heat load is being controlled by the dehumidifier.

Keywords: Liquid desiccant dehumidification, Hybrid system, ASPEN Plus, simulation, effectivity, COP, humidity, VCACs, MRR, Evaporation rate,

• Introduction

The idea of hybrid system consisting dehumidification system along with vapor compression Air Conditioning system (VCACs) system was conceived long ago due to its various energy saving capabilities. This called for extensive research on making it feasible for industrial or commercial applications. We know VCAC system alone has high and efficient cooling capacity; however, the high energy consumption for sensible and latent cooling has always been an issue. The dehumidification system also has wide industrial role and they too tend to consume high electrical power for low evaporating temperatures. The Hybrid VCAC system with dehumidification can achieve the energy saving we need by utilizing low temperature heat. The desiccant dehumidification system has its own charm for its additional cooling effect on the process air. This also reduces a cooling load on VCAC system.

• Review of Previous Literatures

Several research works have been done to perfect this hybrid technology since late 1990s. Howell and Peterson [3] made earliest research on hybrid system and its advantage due to of latent heat removal of dehumidification with high efficiency and to use to save sensible cooling load of vapor compression system. No experimental work was done by them but theoretical possibility of economic and energy saving advantages were suggested. Also predicted energy saving and reduced electric amperage consumption air conditioner unit for same outlet air temperature. Dai et al. [2] actually developed and analysed a hybrid system with VCACs with dehumidification technology. A system with two stage dehumidification system and VCAC system along with a desiccant solution regeneration system was established. The Coefficient of Performance (COP) of refrigeration unit of this hybrid system (along with evaporative cooling) was compared with a standalone VCAC system at ARI conditions. The results were impressive 80-90 % improvement in COP was obtained and a significant 20-30%

more cooling effect. A decrease in electric power consumption and reduced size of VCAC system was evident. All these effects bar COP increase was due to evaporative cooling in dehumidifiers and dehumidification was also beneficial for VCACs as water condensation was lowered. Liu et al. [4] Developed a theoretical model to simulate heat transfer and mass transfer coefficients in a crossflow and counterflow dehumidifiers. Both the columns used structural packing and mass transfer coefficients as specified inputs were used for simulation. A temperature profile of column stage was done proving that parameters like desiccant temperature, inlet air humidity and temperature were important parameters which influence the equilibrium and rate of mass transfer in between streams. Yang Li et al. [9] constructed a humidification dehumidification (HDH) system and a mathematical model was developed for this system. A theoretical and experimental investigation of operating parameters like inlet stream temperatures and solution concentration on objective functions which are evaporation rate and specific steam consumption was done. The effect of operating parameters was done on each objective function which suggested a high evaporation rate and low SSC are most favourable. Huang et al. [10] In their research, the electricity consumption model and pressure drop model of humidification-dehumidification (HDH) system was developed. Experimental study was carried out to investigate the effects of operating parameters on the pressure drop of HDH system. The adjustment of solution mass flow rate and solution inlet temperature in humidifier is a priority for getting better results. Several experimental setups were investigated by Fumo and Goswami [2000] and Koronaki [2012] which were used in this study with detail for validation purposes. Researchers like Chung and Ghosh (1996), Oberg and Goswami (1997) and Qi et al. (2019), have developed empirical mass transfer correlations from experimental data which best fit for different systems and it was observed that the empirical formula changes with change in any one of the following parameters in dehumidifier systems e.g., desiccant solute and solvent material, Tower packing choice, operation temperature range and flow direction for the two streams (cross, counter or co-current).

A modified hybrid system small scale system developed by Mansuria et al. (2020) [2] developed another working small-scale hybrid dehumidification-VCACs model and performed using common refrigerant R-32a and Calcium Chloride solution as desiccant solution. The study compared the COP increase with a standalone VCAC system and it was found that a 27.54 % of maximum improvement was recorded. Experimental investigation of influence of parameters (input variables) on improved COP of hybrid system and change in humidity ratio of process air was done. Hybrid systems with absorption refrigeration system studied the for a more efficient lithium salt solution by Su et al. (Jan. 2017) [15] proposed a two-stage liquid desiccant dehumidification system with cascaded utilization of low temperature heat. A sensitivity analysis study was done to check impact of desiccant salt concentration in solution, second stage dehumidifier temperature and mass flow ratio of desiccant solution to inlet air, on supply air humidity ratio and COP of the cascade system. Obviously, optimal values obtained coincided with the theoretical predictions in literature.

- **Research Objective**

All the previous research prompted us to select a lithium Chloride salt for desiccant solution for dehumidification. The goal of this study is to develop a numerically robust dehumidifier and regeneration model and integrate with a VCA system, an prove the workability and efficient desiccation property and feasibility in using it with a VCAs model first and then study the parametric sensitivity of its one or more performance index. The parametric analysis reveals to its optimum operating conditions and behaviour which will be used for later research.

- **Liquid Desiccant Dehumidification System**

The dehumidification of air using liquid desiccant solution is done in packed towers mostly with either co-current, cross current or counter current mode, but this work has chosen counter current mode of operation because of its superior performance. The dehumidification has to be coupled with regeneration column to complete the liquid desiccant cycle and then it can be used in continuous operation.

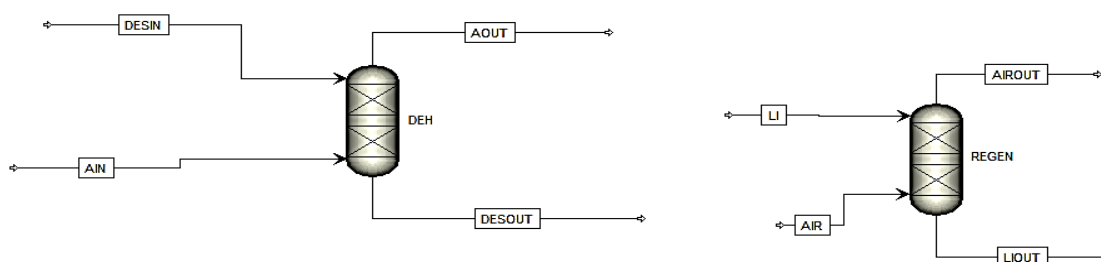


Figure 1. Dehumidification Column and Regeneration Column Modelled in ASPEN Plus

The two columns shown in Fig. 1 are modelled in ASPEN Plus V8.8 version to act as packed bed towers for dehumidification using liquid salt solution (Lithium Chloride) as desiccant. The desiccant solution stream is sent to the top stage of the column and ambient air stream is sent to bottom stage. The outlet air streams from both the columns are from the topmost stage and desiccant solution streams are from bottom stage. The liquid desiccant chosen is the Lithium Chloride (LiCl) in water solution which mostly is between 30% to 42% solution in mass percentage. So, by H. E Moran (1956) [3] $\text{LiCl} \cdot 3\text{H}_2\text{O}$ best fits the modelling. To get desired concentration of in between 30-40% at any point is adjusted by adding calculated moles of water to it.

• Governing Equations

To design a dehumidification system, we must be able to model a packed tower into a dehumidification tower. However, in ASPEN Plus version V8.8 does not provide a special dehumidifier, so we model our column using a packed bed absorber (Radfrac) column. To successfully design first we must prove the hypothesis that equations for design of absorber column also work for a dehumidification process.

The basic equations for design of a packed tower are same for both dehumidification tower or absorber, starting from differential mass balance eqn. [Perry's]

For dehumidification process the overall mass balance equations are [Treybal] on converting all the important equations from mass fraction to humidity ratio equation we get equation from which proves the hypothesis that absorber equations work well enough for dehumidification operations.

The Transport equation for design basis from mass balance equations and mass transfer coefficient which is calculated by mass transfer correlation equations. The governing equations are solved in ASPEN Plus compiler by converging method of Newton's method procedure as generally is used in Radfrac.

• Mass Transfer Correlations

The mass transfer correlations for dehumidification process depends on every factor of column design. The correlations change for each process if different Desiccant solution, packing material, packing factor, tower dimensions any one or all of these factors change. Therefore, a careful selection of mass transfer correlations is necessary to model correctly working column process, whether be it absorbing or dehumidification or regeneration.

While designing Radfrac tower ASPEN Plus, general equations of mass transfer correlations format is present where the user has to model their correlations according to the rigid equation skeleton. These equations are given as

$$\text{Sh}_L = c_1 \cdot \text{Re}_V^a \cdot \text{Re}_L^b \cdot \text{Sc}_L^c \cdot \text{Fr}_L^d \cdot \varepsilon^e \cdot (1-\varepsilon)^f \dots\dots\dots \text{eqn. (1)}$$

$$\text{Sh}_V = c_2 \text{Re}_V^i \cdot \text{Re}_L^j \cdot \text{Sc}_L^k \cdot \text{Fr}_L^l \cdot \varepsilon^m \cdot (1-\varepsilon)^n \dots\dots\dots \text{eqn. (2)}$$

Where Sh = Sherwood Number for vapor Sh_V and liquid phase Sh_L

Re = Reynold's Number for vapor Re_V and liquid phase Re_L

Sc = Schmidt's Number for vapor and liquid phase.

Fr_L = Froude's Number for liquid phase

ε = Void fraction of Packing material, which is again, calculated by equation (3) [Onda et al.]

$$a_t D_p = 6(1-\varepsilon) \dots\dots\dots \text{Eqn. (3)}$$

Where, a_t = Total specific surface area of packing [m^2/m^3] (Total surface area per volume)

And D_p is nominal size of packing [m]

• Experimental Validation of Model

For a mathematically developed model, it is important to validate the numerically simulated data with experimental data, to check its nearness to real process. The experimental validation does not need to be absolutely accurate but, the deviation in experimental and simulated data must be within an acceptable range.

The dehumidifier and regenerator model was developed according to the design data provided by Fumo and Goswami (2000) and then the model was validated with experimental data provided by them. The Table 1. lists the packed bed design parameters for the dehumidifier and regenerator column both.

Table 1. Design of Packed Tower Fumo and Goswami

Design Rating of packed Tower	Value	Remarks
Internal diameter	24 cm	-
Total diameter	25.4 cm	-
Height of packing	60 cm	-
Type of packing	Rasuchert Hiflow	Pall ring is selected.
Specific surface area of packing	210 m ² /m ³	-
Size or dimension of packing	2.54 cm	-
Packing material	Polypropylene	Specified as plastic in ASPEN

The constructed column was used for LiCl solution as desiccant and mentioned the mass transfer correlations by Onda et al. (1968) was best fitting for the column hence the ASPEN developed model also used the same correlations also provided by Onda et al (1968)

The equations are then modified to fit in the column rating design in ASPEN Plus equation format and design for both dehumidifier and regenerator operation into eqn. (1) and eqn. (2). and run with the specified stream input data from the Table 2. And Table 3. The input parameters are air superficial flowrate i.e mass flowrate per cross sectional area, L as superficial solution flowrate, Solution Temperature T_L, air temperature T_a, LiCl mass concentration in Solution X in percentage and inlet air humidity ratio Y in (kg water/kg dry air). Air and solution flowrates G and L outlet experimental data were not available hence were not considered for simulation and change in LiCl concentration was too little hence its comparison was ignored.

Table 2. Experimental Validation of Dehumidification data (expt. No. 5) [Fumo Goswami(2000)].

	G (kg/(m ² s))	T _a (°C)	Y (kg/kg)	L (kg/(m ² s))	T _L (°C)	X (%)
Experimental input data	1.183	40.10	0.018	6.287	30.50	34.40
Experimental output data	-	33.10	0.0115	-	32.900	34.3
Simulation output data	-	33.75684	0.011128	-	31.91966	34.3
Error	-	0.65684	0.00037	-	-0.98034	-
Error Percentage	-	1.98	3.230549	-	2.9	-

Table 3. Experimental Validation of Regeneration data (Expt. No. 3) [Fumo and Goswami (2000)].

	G (m/s)	T _a (°C)	Y (kg/kg)	L (m/s)	T _L (°C)	X (%)
Experimental input data	1.4380	29.80	0.0177	6.4790	65.10	34.50
Experimental output data	-	57.50	0.0488	-	56.60	35.20
Simulation output data	-	-	0.050239	-	-	35.19
Error	-	-	0.0014	-	-	-
Error Percentage	-	-	2.949318	-	-	-

The data from simulation for both regeneration process and dehumidification process are validated against experimental data from Fumo (2000), and thus the error or deviation from experimental data is recorded. The

tables 2 and 3 are one such experimental data sample from the literature whose error percentages in output data and input values are given. The error percentages in the sample data from table 2 do not exceed 3.5 % and regeneration 3% which are acceptable range. The maximum error percent in dehumidifier simulation data and experimental data is 4.68% and it was found that regeneration data error percent is 8.65% for humidity ratio in outlet air stream.

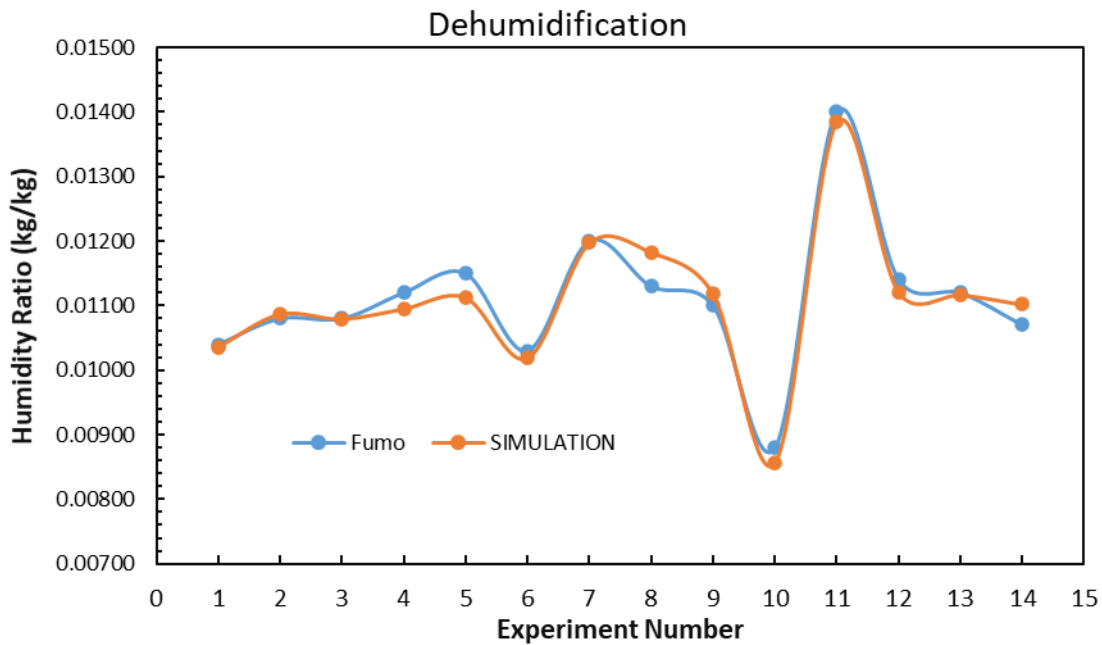


Figure 2. Experimental Validation of Absolute humidity for Dehumidifier Data (Fumo, Goswami (2000))

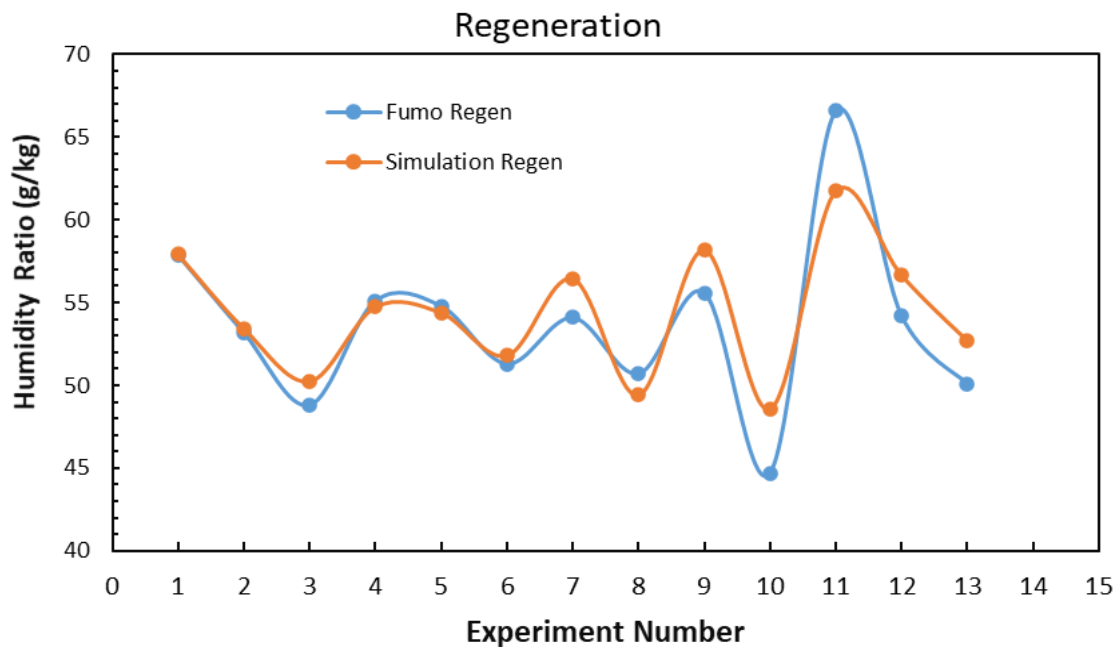


Figure 3. Experimental Validation of Absolute Humidity for Regenerator Data (Fumo, Goswami (2000))

The above two graphs of fig. 2 and fig. 3 are the direct comparison of humidity ratio of simulation and experimental data for corresponding experiment number as mentioned in literature Fumo (2000). We can see that the data are better and closer for dehumidification modelling than regenerator data however still the maximum error percentages are in acceptable range for both models.

To check the robustness, we have again validated the simulation model with experimental data from Koronaki (2012) which also simulated their data with the mass transfer correlations from Chung and Goswami (1996). The dehumidifier model was again developed according to the design data provided by of Koronaki et al. (2012) and then the model was validated with experimental data provided by them. The Table 1. lists the packed bed design parameters for the dehumidifier column.

Table 4. Design of Packed Tower Koronaki et al. (2012)

Design Rating of packed Tower	Value	Remarks
Internal diameter	15.24 cm	-
Height of packing	41 cm	-
Type of packing	PVC Structured	Generic Structured used
Specific surface area of packing	223 m ² /m ³	-
Packing material	Polypropylene	Specified as plastic in ASPEN

The constructed column was used for LiCl solution as desiccant and mentioned the mass transfer correlations by Chung and Ghosh (1996) was used for their mathematical design column hence in this research ASPEN developed model also used the same correlations also provided by Chung and Ghosh (1996).

This equation is solved to fit into eqn. (2) to be modelled inside ASPEN dehumidifier model and using same input parameter values from experimental data, simulation is run to get output dataset of stream parameters. The stream parameters e. g. outlet air humidity ratio W_a , solution and air temperature (T_s and T_a respectively) are compared with simulation data from developed ASPEN Plus model. Table 4. mentioned the input mass flowrates of air and solution, m_a and m_s with other parameters. The experimental data for outlet parameters of X , m_a and m_s are not provided.

Table 5. Experimental Validation of Regeneration Data (Expt. No. 5) [Koronaki (2012)].

	m_a (kg/s)	m_s (kg/s)	T_a (°C)	W_a (kg/kg)	T_s	X (%)
Experimental input data	0.0318	0.1919	24.1.	0.0149	16.90.	31.0
Experimental output data	-	-	19.1.	0.008	18.30.	-
Simulation output data	-	-	18.498	0.007803	19.14721	-
Error	-	-	-0.602	-0.000197	0.8472104	-
Error Percentage	-	-	-3.15	-2.467	4.63	-

After the simulation and validation of data we have table 4, in which one such experimental data sample from the literature whose error percentages in output data and input values are given. The error percentages in the sample data from table 4 do not exceed 4.65 % and which is acceptable.

The maximum error percent in dehumidifier simulation data and experimental data for humidity ratio value was found to be 8.9% which is acceptable but is still higher. For outlet air temperature, the data has maximum error of 3.15% was observed which is very promising. But for solution outlet temperature, the simulation data deviates by almost 10% which raises concern.

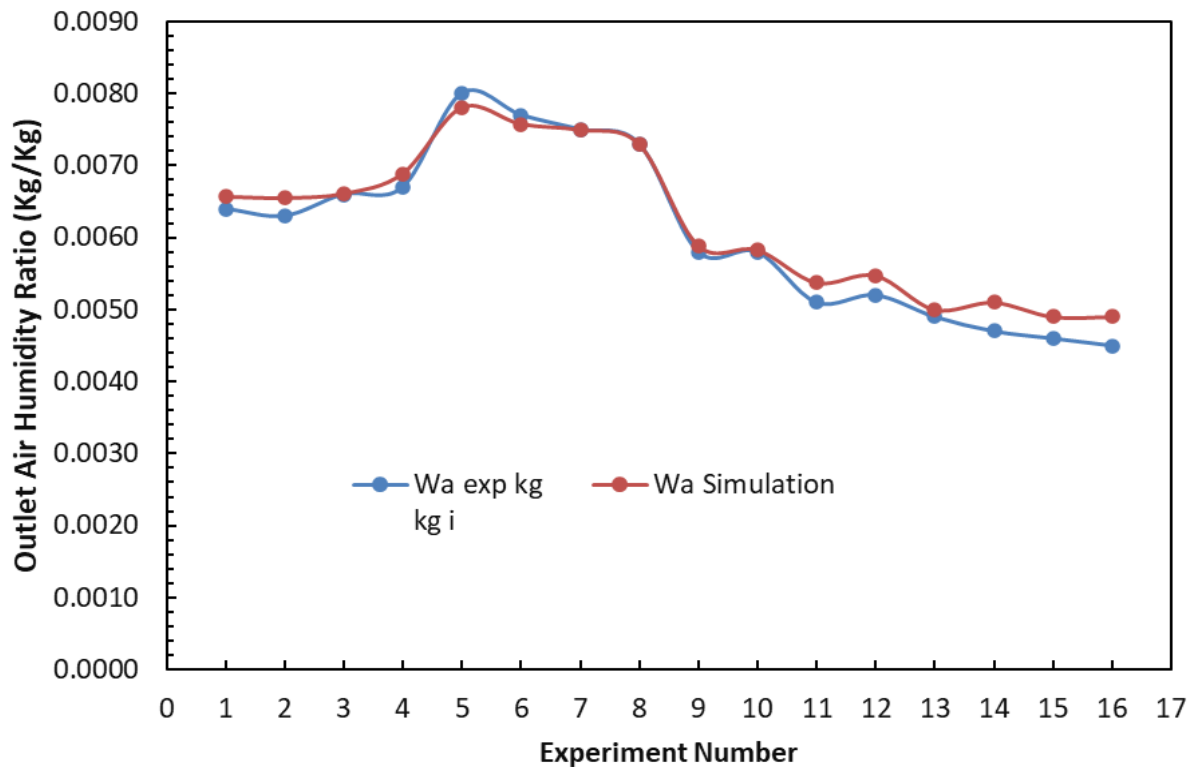


Figure 4. Experimental data comparison with simulation data Koronaki (2012).

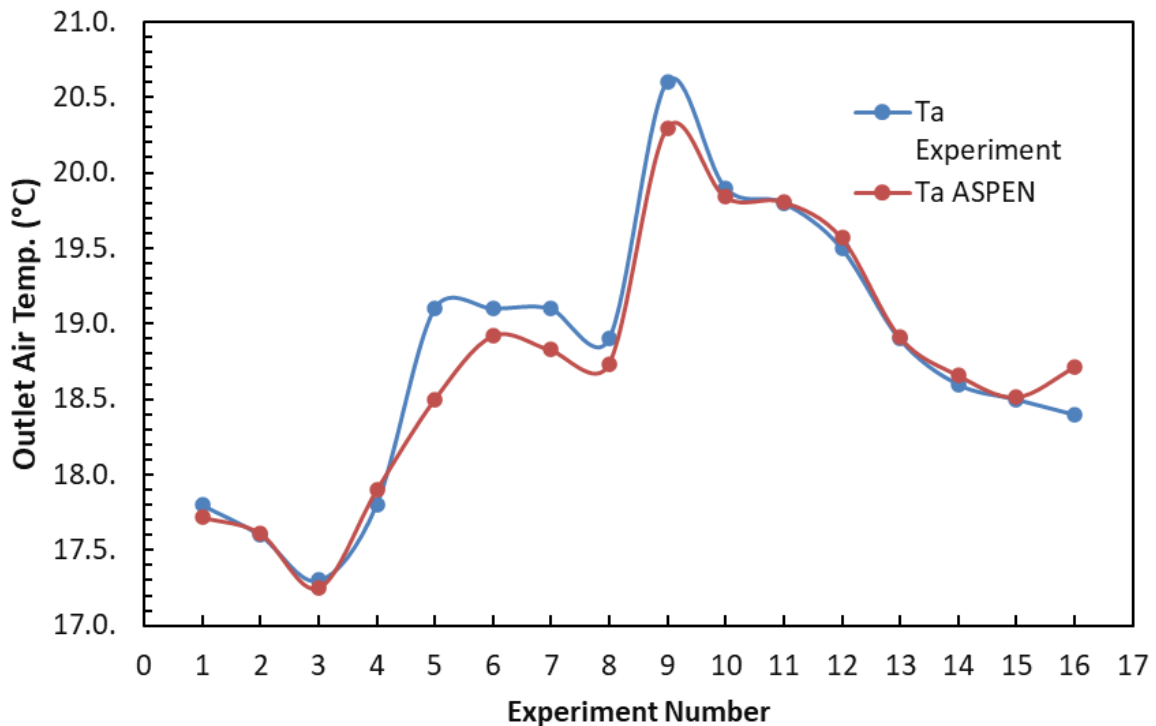


Figure 5. Validation of simulation data with Experimental Koronaki (2012)

The validation of air temperature and air humidity ratio graphs in fig. 4 and fig. 5 are the proof of successful modelling of dehumidifier packed tower using the transfer correlations from Chung and Ghosh (1996) for gas side mass transfer. In figure 4 the maximum error of 8.9% is observed on experiment number 16 which is apparent on graph. The experiment number 5 in fig.5 is point of maximum error which is 3.15%. The solution temperature has a larger deviation up to 11% hence the conclusion can be drawn that numerical modelling of random packings are better to model in ASPEN Plus, however if properly defined structured packing can also work well.

These validation graphs are proof of robust system modelling and prompts us to use these correlations equations for dehumidifier column design in later stages of the research.

- **System Description of Hybrid Desiccant dehumidification integrated with VCAC system.**

The system shown in Fig.6 shows the schematic description flowchart of the proposed system that combines a VCAC system and a liquid desiccant dehumidification (LDDh) system. This consists two complete loops; outer cycle is desiccant dehumidification system along with desiccant regeneration system, inner cycle is a standard VCACs driven by a standard refrigerant R-32a.

In LDDh cycle the humid warm air is let inside a dehumidifier column which lowers the humidity ratio of the inlet air and also reduced temperature alongside due to evaporative cooling. The mass transfer of water vapor from air to desiccant solution is due to colder solution temperature the humidity of gas is higher than gas-liquid interface which the moisture transfer from air to solution. then the dried air is now sent to a solution heat exchanger which serves as evaporator for refrigeration cycle. The air is now cooled to suitable temperature for supply. The desiccant solution chosen is Lithium Chloride solution for its availability and better efficiency. A colder desiccant solution is passed through dehumidifier column and is diluted in the process. The diluted solution is now needing to be regenerated in order to reverse the mass transfer, the solution is heated in condenser unit of refrigeration process. This increase in temperature shifts the equilibrium concentration so that the solution now loses moisture when solution comes in contact with air in Regenerator unit after it exits the condenser and is heated. A bone-dry air stream or ambient stream is fed to regenerator to absorb the moisture from hot dilute desiccant solution. The solution now again concentrated undergoes cooling either in an air-cooled fin and tube heat exchanger or a water-cooled solution heat exchanger. By cooling the solution becomes ready for dehumidification operation and this completes the desiccant solution cycle.

The inner cycle is a standard VCAs cycle, consisting of compressor to pressurize the refrigerant. Hot and compressed refrigerant is passed through a condenser to liquify the refrigerant rejecting heat to the desiccant solution. The liquified refrigerant is now sent to evaporator after being passed through throttle valve to depressurize. In evaporator the real work is done by the refrigerant where it cools the air stream. This cooling effect is the useful work load needed to calculate coefficient of performance (COP). The exit stream from evaporator is again channelled into compressor completing the refrigeration cycle.

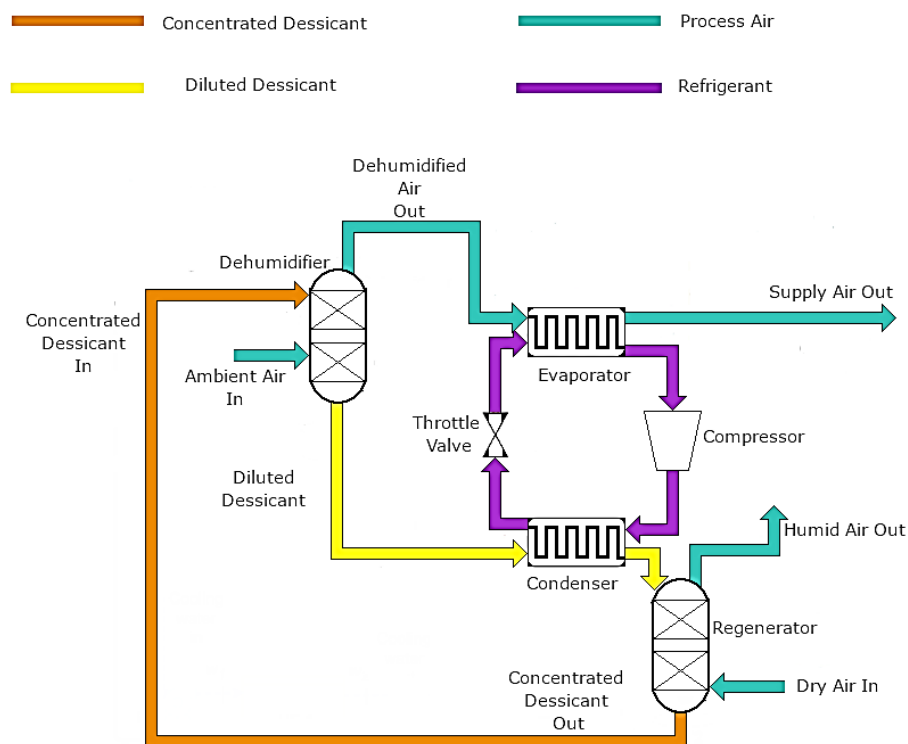


Figure 6. Schematic Configuration of a Hybrid System of Liquid Desiccant Dehumidification and VCAC Cycle

- **System Simulation and Modelling**

The hybrid model is developed in ASPEN Plus to simulate the working conditions of a similar lab scale experimental setup validating the objective parameters and working conditions. The following sections explain the approached designing.

- **Thermodynamic Property Methods**

The simulation consists of different compound and mixture streams which all behave different under real conditions (pressure and temperature conditions), so any one model is not suitable for all streams as highly condensed refrigerant stream and hot air stream have very different thermodynamic property equations.

ASPEN Plus has built in models for simulation of hybrid system dehumidification and VCAC system. For desiccant solution electrolytic non-random two liquids (ELECNRTL) method in ASPEN PLUS is most suitable with all binary interactions specified. For air streams ELECNRTL both best because of its direct interaction with desiccant solution as well as with minimal deviations from ideal behaviour as the mass flowrate are very low. The solution refrigerant has REFPROP as best suited model for thermodynamic calculations.

- **ASPEN Model**

Two models – one Hybrid LDDh with VCAC system and a Standalone VCACs were developed in ASPEN Plus software for simulation and comparison with each other. All parameters of VCAC cycle were kept same in standalone VCACs model and Hybrid Model. Fig. 7. shows the complete Hybrid Model flowsheet and Fig. 8. is the standalone VCACs flowsheet.

The hybrid LDDh system Fig.7 has the same flowsheet and component specification as Fig.6 but with an extra Flash Drum. This flash drum is to flash evaporate any air dissolved in desiccant solution in simulation. This dissolution is a common phenomenon in ASPEN RadFrac column operation, hence we introduce a flash drum only for the sake of it, to minimize air content in solution.

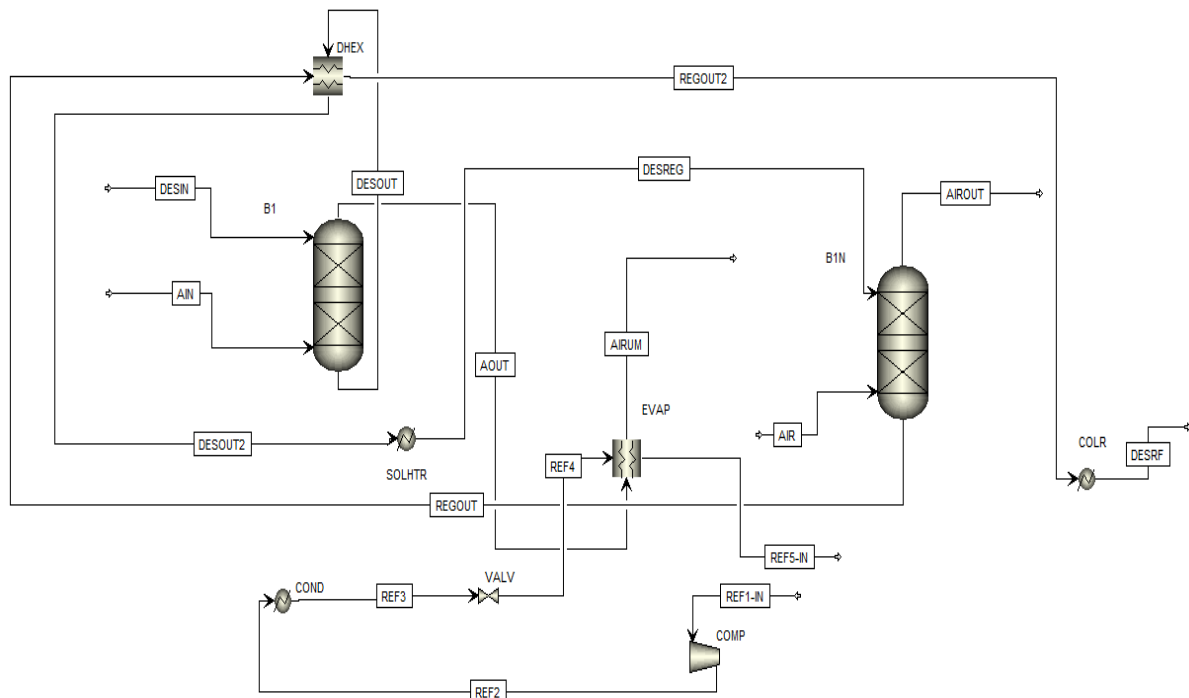


Figure 7. Model and Material Streams of Hybrid System in ASPEN Plus

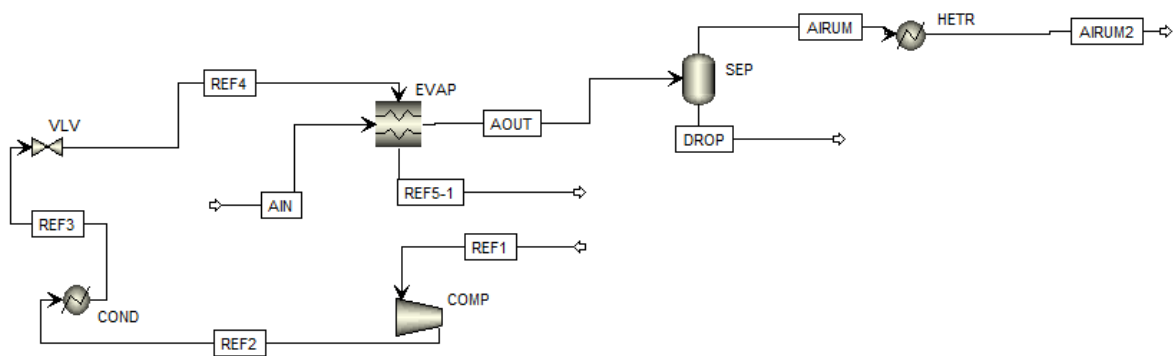


Figure 8. ASPEN Flowsheet of Standalone Vcacs Model for Reference

- **Parametric specifications and Assumptions**

The Table 6 demonstrates all initial parametric and design specifications for base-case to simulate the system which fulfils all required objectives.

Table 6. Parameter Specifications of the Hybrid System

<i>Component</i>	<i>Parameter</i>	<i>Value</i>	<i>Unit/Remarks</i>
LiCl solution	Temperature	29	°C
	Salt concentration	0.39	Mass Fraction
	Mass flow rate	0.67	kg/s
	Inlet pressure	1.0	Atm
Ambient air	Dry Bulb Temp.	33	°C
	Humidity Ratio	21.5	gm/kg
	Mass flow inlet	0.086	kg/s
	Air velocity	2	m/s
	Inlet pressure	1.0	Atm
Compressor	REGN inlet pressure	1.0	Atm
	Efficiency	95	Percent
	Outlet pressure	5.3	Bar
Valve	Pressure range	3.7-5.3	bar
	Outlet pressure	3.7	Bar
Dehumidifier	Stages	2	
Regenerator	Stages	2	

- **Component Modelling and Working**

ASPEN Plus components are used with predefined standard equations for calculations of outlet streams conditions. Following subsections are details of the component blocks used in the simulation.

- **Dehumidifier Column**

Denoted as DEH in flowsheet, the dehumidifier column is modelled as RadFrac column in ASPEN plus with packing material as Pall ring and specified number of stages to ensure a observable change in air humidity. The air stream is sent at bottommost stage and desiccant is dropped at topmost stage known as condenser stage in ASPEN. The mass transfer occurs due to vapor pressure difference in both streams. The packing material, packing factor and height equivalent theoretical plate HETP were defined accordingly.

- **Regenerator Column**

This is denoted as REGN in ASPEN flowsheet. Its modelling and design are similar to dehumidifier column, even though its purpose is polar opposite. For convenience the equipment designing parameters like packing characteristics and stages are kept same. The input streams are a dilute desiccant at top stage and a drier air stream at bottom stage. The mass transfer direction is reversed because of the water vapor pressure difference of desiccant is air stream.

- **Evaporator**

Evaporator component is modelled as solution heat exchanger blocks in ASPEN and denoted in flowsheet as EVAP. The refrigerant and air stream are input for evaporator so Both REFPROP and ELECNRTL are used as thermophysical methods respectively. Flow pattern in the heat exchanger is specified as counter current flow. The vapor quality of refrigerant outlet stream is defined as one which in turn determines air stream outlet temperature. This is only one major input which specifies that latent heat is added to refrigerant stream. The air stream is cooled to comfortable temperature and humidity and is now ready for supply.

- **Condenser**

In ASPEN plus model condenser has both Refrigerant stream and desiccant stream for each stream thermodynamic method needs to be clearly specified. Denoted as COND in flowsheet is a heat exchanger model which calculates the net duty and heat duty by given flash type output parameters. The liquid fraction of outlet refrigerant is set as one. However, in condenser both sensible and latent heat is removed from refrigerant to heat the desiccant solution.

- **Pressure Changers**

An isentropic compressor model denoted as COMP in both flowsheets are used to increase the refrigerant pressure to ensure that when the refrigerant is throttled using a valve (VLV in flowsheet fig. 7 fig. 8) the refrigerant reverts back to its original state after doing its work in evaporator and condenser.

- **Performance Indices**

According to various literature sources we considered two performance parameters or indices of major significance in designing our hybrid system.

- **Coefficient of Performance of Hybrid System (COPH)**

Generally defined as direct cooling effect produced by an equipment, however our cooling effect is also dependent on dehumidification process as it changes air quality. According to many literatures referenced e.g. Su. Et al. [15] direct cooling effect can be calculated by following equation.

$$COP_H = \frac{Q_{deh} - Q_{vcr}}{\Sigma W} \dots\dots\dots \text{eqn. (2)}$$

$$\text{where, } Q_{deh} = H_{in} - H_{O1} = [(m_{air} \cdot h_{in}) - (m_{air2} \cdot h_{O1})] \dots\dots\dots \text{eqn. (2.1)}$$

$$Q_{VCR} = H_{O1} - H_O = \{(m_{air2} \cdot h_{O1}) - (m_{air3} \cdot h_O)\} \dots\dots\dots \text{eqn. (2.2)}$$

Where, H_{in} = Total Mass Enthalpy of inlet air which is also calculated as $(m_{air} \cdot h_{in})$, H_O is Total mass enthalpy of supply or outlet air from evaporator and H_{O1} is the Total mass enthalpy of air stream coming out of dehumidifier column.

The heat removal loads are divided by summation of net-work (ΣW) and heat duty required for all components like compressor, condenser, solution heater etc. Q_{deh} is the dehumidifier heat load removal from the air stream in the process and Q_{vcr} is the heat load removal in evaporator of VCAs system.

ΣW is given as sum of Q_{sol} , W_{comp} and Q_{cond} , mainly, for given calculations in this work where Q_{sol} is net heat duty required by solution heater for regeneration, W_{comp} for compressor net power input and Q_{cond} is the condenser net duty of heat taken out from refrigerant.

- **Change in Humidity Ratio of Air Stream ($\Delta\omega$)**

Humidity ratio calculated in ASPEN by grams of moisture per kg of dry air. Extent of change in this humidity depicts effectiveness of dehumidifier and the point where this parameter changes from positive value to negative value holds a very important role in designing of this system.

$$\Delta\omega = \omega_1 - \omega_2 \dots\dots\dots \text{eqn. (3)}$$

Where, $\Delta\omega$ is the change in humidity ratio of process air, ω_1 is the humidity ratio of input ambient air stream to dehumidifier and ω_2 is humidity ratio of drier air stream out of dehumidifier.

- **Dehumidifier Effectiveness (ϵ_m)**

The dehumidification or dehumidifier/column effectiveness is the measure of performance of the dehumidifier. It is defined as the ratio of actual change in absolute humidity ratio between inlet and outlet air conditions of dehumidifier to the maximum possible change in absolute humidity. It can be expressed as below equation (3).

$$\epsilon_m = \frac{\omega_1 - \omega_2}{\omega_1 - \omega_e} \quad \dots\dots\dots \text{eqn. (4). or } \epsilon_m = \Delta\omega / (\omega_1 - \omega_e) \quad \dots\dots\dots \text{eqn. (5)}$$

where ω_1 is the absolute humidity of ambient air at inlet of dehumidifier and ω_2 is the absolute humidity of outlet air stream of dehumidifier column. The ω_e is absolute humidity of air which is at equilibrium with LiCl solution at inlet concentration and temperature.

- **Moisture Removal Rate or Condensation Rate (MRR).**

It is the performance measure of a dehumidifier column which is defined as the total amount of moisture removed from the air stream in the column. It is expressed mathematically as equation given below

$$\text{MRR} = \Delta\omega \cdot m_{\text{air}} \quad \text{or} \quad \text{MRR} = (\omega_1 - \omega_2) \cdot m_{\text{air}} \quad \dots\dots\dots \text{eqn. (6)}$$

Where ω_1 , ω_2 and $\Delta\omega$ has the same meaning in eqn. (3) and eqn. (5), and m_{air} is the mass flow rate of air stream out of the dehumidifier column.

- **Evaporation rate (EVR) for a Regenerator**

This is similar performance parameter as MRR but for Regenerator column. The EVR is defined as the total moisture added to the air stream from hot and dilute desiccant stream. Mathematically it is defined as

$$\text{MRR} = \Delta\omega_r \cdot m_{\text{air}}^r \quad \text{or} \quad \text{EVR} = (\omega_3 - \omega_2) \cdot m_{\text{air}}^r \quad \dots\dots\dots \text{eqn. (7)}$$

Where ω_2 is the same as in eqn. (6) or the humidity ratio of air stream entering the regenerator column, ω_3 is the humidity ratio of air stream exiting regenerator which is more humid and $\Delta\omega_r$ is the difference between the two. The m_{air}^r is mass flow rate of air stream out of the regenerator column.

- **Results and Discussion**

We conduct both simulation and parametric analysis in ASPEN plus. For simulation a base case is set with input parameters in Table 1. Then the sensitivity analysis of each performance index is done in order to get an idea of optimal performance.

- **Mass Balance for Model Verification**

Mass balance of cycle end streams in ASPEN Flowsheet prove the feasibility of cyclic process of desiccant and Refrigerant cycle.

Table 8. Mass Balance Verification in Hybrid System (fig.3)

Stream Name (ASPEN flowsheet)	DESIN	DREG	REFIN	REFCOMP
Total Desiccant Mass flow (kg/sec)	0.70	0.699976		
LiCl mass flow (kg/sec)	0.273	0.27299		
Water mass flow (kg/sec)	0.427	0.4270004		
Refrigerant Mass flow (kg/hr)			7.0	7.0

- **State Point Results of Proposed System**

ASPEN generated state points refer to each stream state in cyclic process. Table 3. depicts the stream states denoted by names in ASPEN Flowsheet. These are a base case simulation values of both input and results before changes are made in parametric analysis.

Table 9. Streams State Point Results (States Refer To Fig.3)

Label Number	State	Mass flow rate (kg/sec)	Temperature (°C)	Pressure (bar)	Vapor Fraction	
Dehumidifier inlet air						Humid. Ratio
1	AIN	0.086	33	1.01	1	
2	AOUT	0.085	29.4646	1.01	1	
3	AIRRUM	0.084593	21.923	1.01	1	
Regenerator inlet air						
11	AIR	0.086	33	1.01	1	
12	AIROUT	0.0869601	37.34352	1.01	1	
Desiccant Loop						
4	DESIN	0.7	30	1.01	0	
5	DESOUT	0.7014069	33.34803	1.01	0	
6	DESOUT2	0.7014069	44.27037	1.01	0	
7	DESREG	0.7014069	49.52	1.01	0	
8	REGOUT	0.7004	45.46677	1.01	0	
9	REGOUT2	0.7004	34.5	1.01	0	
10	DESRF		29			
Refrigerant Loop						
13	REF1-IN	0.00195	12	3.7	1	
14	REF2	0.00195	39.78799	5.3	1	
15	REF3	0.00195	-12.69909	5.3	0	
16	REF4	0.00195	-22.41809	3.7	0.0468382	
17	REF5	0.00195	-22.41809	3.7	1	

Table 10. Stream State Point Results for Standalone VCAC System (Refer Fig.4)

	State	Mass flow rate (kg/sec)	Temperature (°C)	Pressure (bar)	Vapor Fraction
Refrigerant Loop					
5	REF1	0.0127	12	3.3	1
6	REF2	0.0127	54.72995	5.7	1
7	REF3	0.0127	-10.63026	5.7	0
8	REF4	0.0127	-25.34751	3.3	0.0937756
9	REF5	0.0127	12	3.3	1
Air Stream					
1	AIR1	0.086	33	1.0135	1
2	AIR2	0.086	13.6	1.0135	0.9817526
3	AIR3	0.0850154	13.6	1.0135	1
4	AIR4	0.0850154	22	1.0135	1

• Parametric Analysis of Performance Indices

A parametric sensitivity demonstrates the influence of design parameters on performance of the system. This sensitivity analysis provides a specific insight to the system when applied through various operating conditions. Our main performance indices COPH and Moisture effectiveness (ϵ_m) moisture removal rate MRR and evaporation rate EVR are the design specifications whose response with respect to changing design specification parameters considered, e.g., Desiccant solution Temperature (T_d), air mass flow rate (m_{air}) and (m_{rair}), Desiccant Concentration (X_{in}) to dehumidifier and regenerator, Air Temperature (T_{air}) and Desiccant flowrate (m_{des}). When one parameter is changes the others are set constant and the response of each performance index is calculated in ASPEN and plotted. However, for calculation of COP the desiccant cycle was set to complete the loop by adjusting input parameters.

Fig. 9 below shows the COPH value calculated against varying desiccant temperature (T_d). The decreasing trend in COPH response is as expected. The decreasing trend of COPH is due to reduced dehumidification duty which is direct result of lesser dehumidification because of increased vapor pressure of solution reducing the driving force of dehumidification process. Minimum value of T_d taken is 25°C which is low enough for a solution to be stored in a tropical climate condition without additional cooling requirement, and the highest value of T_d taken is 38°C because above this temperature the no satisfactory dehumidification occurs and COPH value falls too low (rendering the purpose of dehumidifier null).

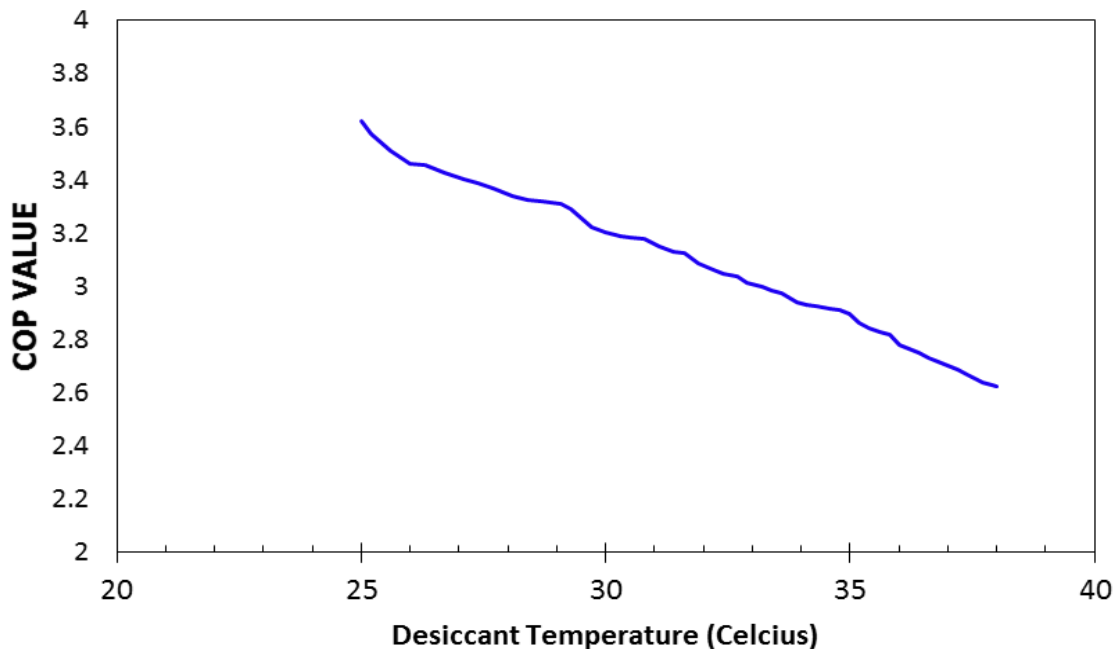


Figure 9. COPH vs Desiccant Temperature T_d

The fig. 10 is sensitivity of COPH with respect to m_{air} . The trend is increasing throughout the graph but the slope of the curve decreases after around 0.09 kg/s. This is because the dehumidifier heat load is increased up to a certain point as desiccant solution flowrate is fixed and ratio of solution to air mass flowrate has reached optimal level at 0.09 kg/sec. As the air flowrate crosses optimal point the dehumidifier load starts decreasing but the flowrate increase dominated the COP calculation hence, the slope of the graph after this point is less.

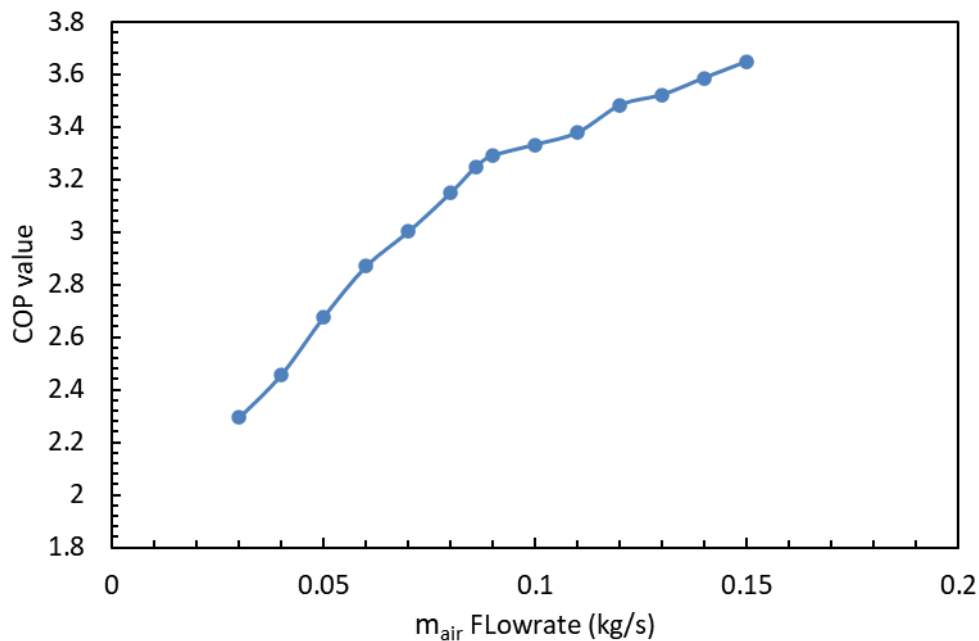


Figure 10. COPH Vs m_{air} Air Mass Flowrate

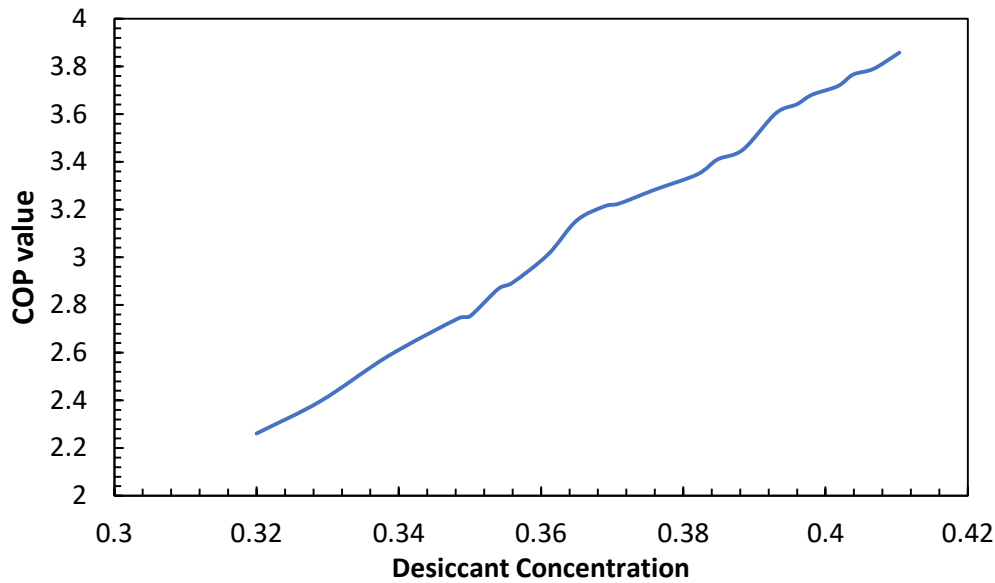


Figure 11. COP_H Vs Desiccant Concentration in Solution

The COP_H variation with respect to concentration of LiCl in solution is shown in fig. 11. Evidently the COP_H value is increasing with increasing concentration of LiCl in solution. This trend is increasing because the higher concentration causes higher dehumidification of air thereby increased dehumidifier heat load removal from air. The concentration varies from 0.32 to 0.41 of LiCl concentration because below 0.32 the dehumidification does not occur satisfactorily to have any impact on COP and above the 0.41 mass concentration the LiCl solution tend to crystallize in real life at room temperature (28°C-35°C).

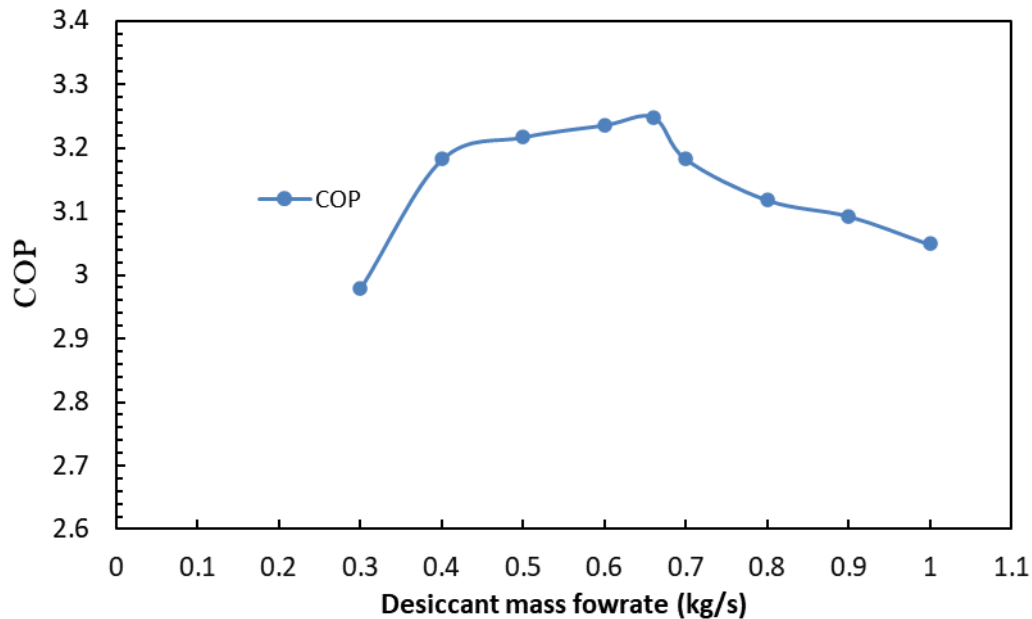


Figure 12. COP_H vs Desiccant Mass Flowrate.

The figure 12 above depicts COP_H variation with Desiccant solution mass flowrate has an increasing trend up to a certain point and then the trend decreases with increasing flowrate. The increasing trend is due to higher dehumidification with increased desiccant flowrate thereby increasing dehumidification load removal. But after a certain point the dehumidification is not as pronounced and the heat required by solution heater to regenerate the solution which causes the COP_H to decrease if the solution flowrate is increased into dehumidifier column. The solution mass flowrate has to be at least three times the air mass flowrate to show any significant dehumidification hence 0.3 kg/s is lowest point on the plot.

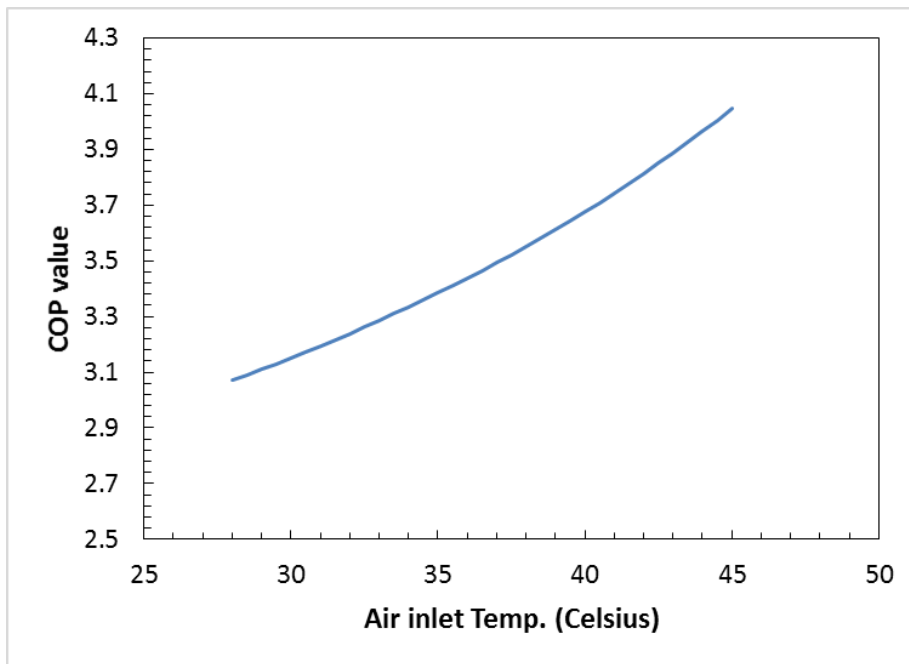


Figure 13. COPH vs Temperature of Inlet Air

The inlet air at ambient conditions into dehumidifier also affects COPH if its temperature changes, as depicted in fig. 12. COPH is apparently increasing with increased air temperature. This increasing trend is due to two main reasons, firstly the dehumidifier column has greater dehumidification heat removal for lower air temperature and for higher temperature sensible cooling in packed bed column also occurs because the solution temperature is fixed at 29°C. Another reason is that the solution when comes in contact with the hotter air the outlet temperature of air is also increased hence, the heat duty required by solution heater for regeneration decreases which gives higher COPH value. The ambient air temperature is chosen to vary between 28°C to 45°C which is the temperature range of a tropical climate condition year-round, as the hybrid dehumidification VCAs works best for warm and humid climates.

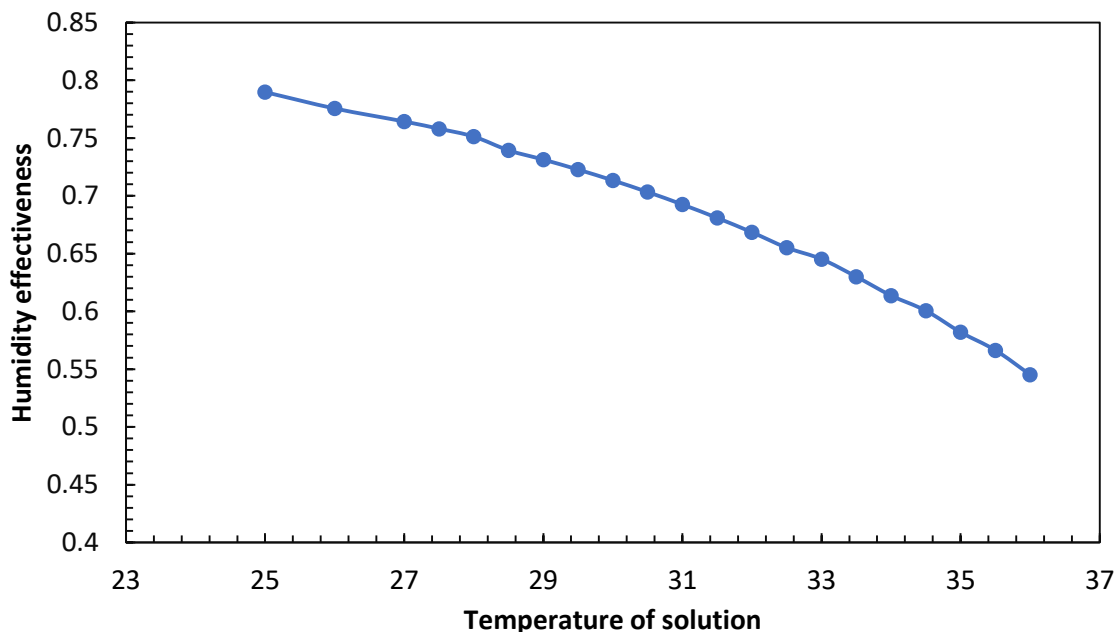


Figure 14. Dehumidification Effectiveness vs Solution Temperature

Dehumidifier effectiveness decreases of a solution with increasing temperature as evident from fig. 14 plot. The temperature of solution increases the vapor pressure of the solution which in turn increases the equilibrium humidity ratio of the system but the actual humidity ratio of outlet air stream increases more steeply, hence the effectiveness is decreased at higher temperature. The calculation results from ASPEN also show that $\Delta\omega$

decrease with increasing temperature which is obvious. The temperature range in plot of fig. 14 is chosen to be 25°C to 36°C as for a tropical warm climate condition the lowest room temperature for liquid storage would not dip below 25°C with no additional cooling and solution temperature higher than 36°C would not give good dehumidification results.

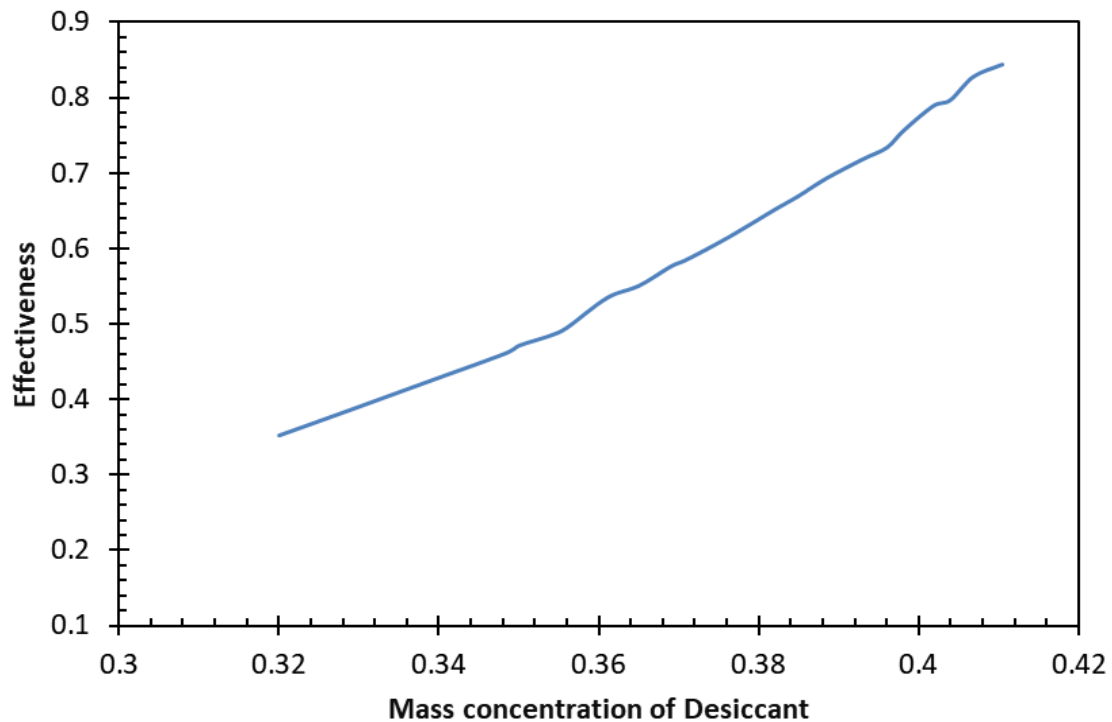


Figure 15. Dehumidifier Effectiveness vs Mass Concentration of Desiccant Solution

Mass concentration of LiCl in desiccant solution is directly proportional to dehumidifier effectiveness as evident from fig. 15 plot of an increasing curve of ϵ_m vs concentration graph. The LiCl of solution decreases the vapor pressure of the solution which in turn decreases the equilibrium humidity ratio of the system but the actual humidity ratio of outlet air stream also decreases, hence the effectiveness is increased if concentration of LiCl increases. The lowest mass concentration point is 0.32 because the dehumidification of air stream is not pronounced if LiCl concentration falls below this point and crystallization occurs for LiCl solution above concentration of 0.41 at room temperature.

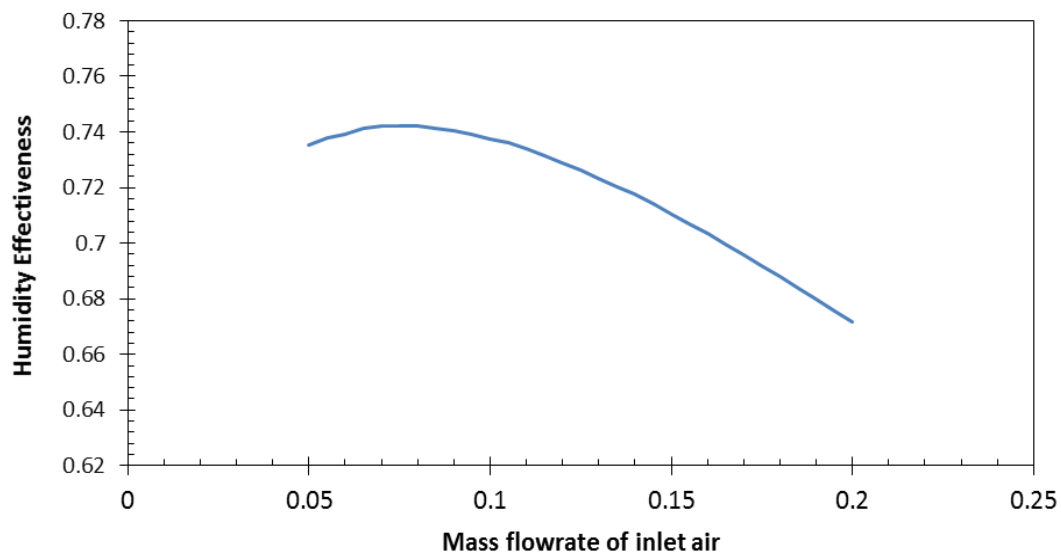


Figure 16. Dehumidifier Effectiveness vs Inlet Air Mass Flowrate

The plot of fig.16 shows the curve of changing dehumidification effectiveness with increasing mass flowrate of air. The graph first increases up to a maximum point ($\epsilon_m = 0.742189$), it is the point where optimal solution to air mass ratio is reached (at about 8-8.5) then the dehumidification effectiveness decreases as lesser dehumidification is observed at higher air flowrate, even though equilibrium humidity ratio remains unchanged. The mass flowrate of air is varied between 0.05 kg/s to 2 kg/sec to make the increasing and decreasing trend of effectiveness curve apparent.

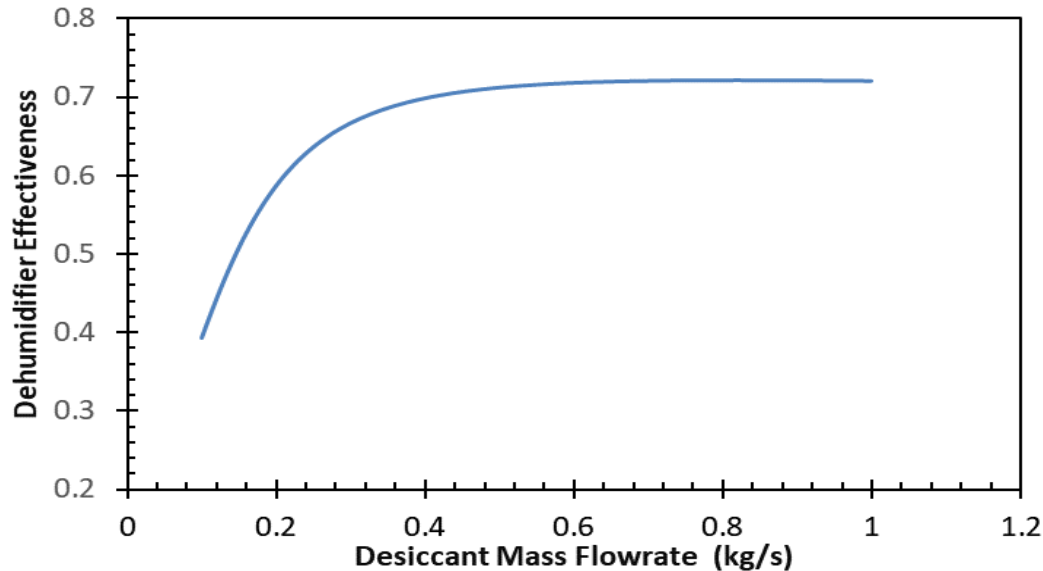


Figure 16 .Dehumidifier Effectiveness vs Mass Flowrate of Desiccant Solution

The plot of dehumidifier effectiveness of fig. 16 shows the asymptotic curve whose maximum value for this limit is 0.722. The curve did not reach a maximum value till the end of the curve because desiccant flowrate if increased still gives slightly better dehumidification at higher flowrate even after crossing the optimal solution to air mass ratio. This however is not feasible for system design and COPH calculation. The increasing curve is expected to rise quickly from lower value of 0.1 to 0.7 kg/s which was evident from graph and after 0.7 kg/s

Moisture Removal Rate (MRR)

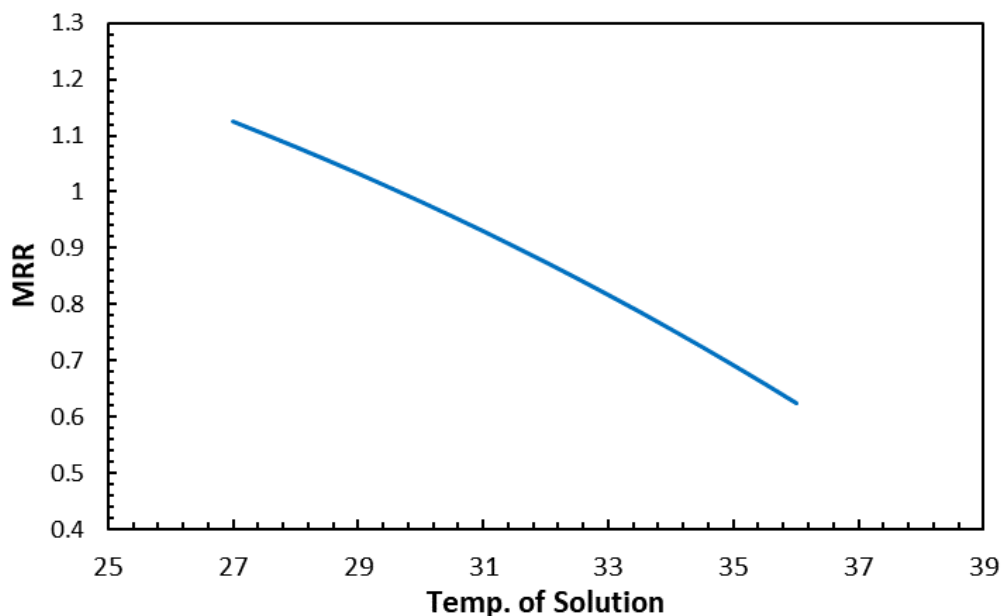
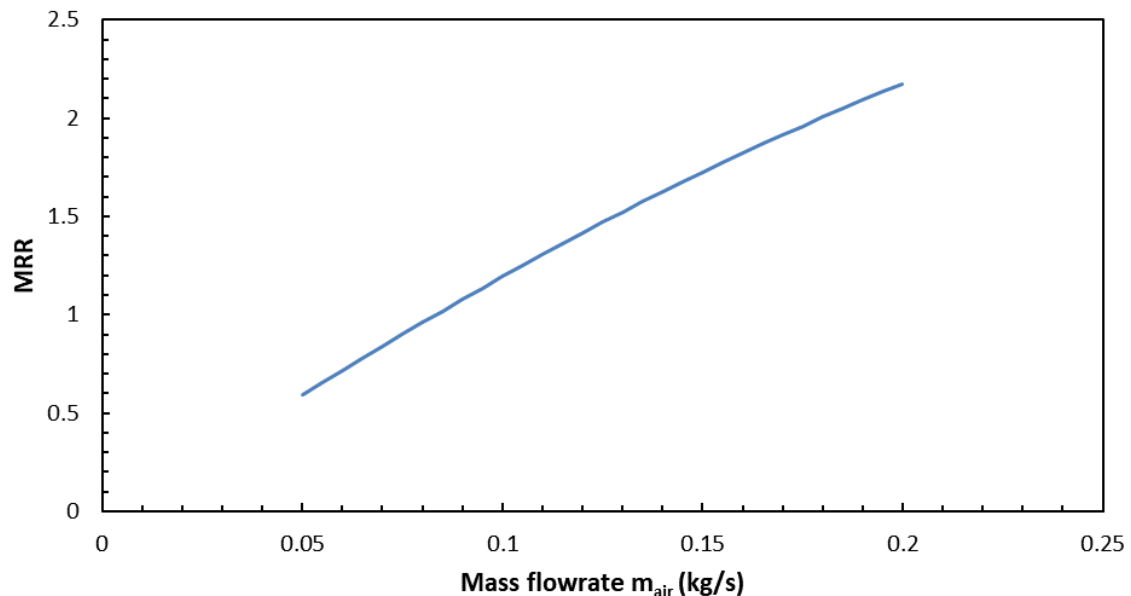


Figure 17. Moisture Removal Rate vs Temperature of Solution

The MRR of dehumidifier is dependent of temperature of solution as depicted in fig.17. As we have seen earlier ϵ_m and $\Delta\omega$ both decrease with increased temperature so it is logical that MRR will also decrease. The temperature range is already justified earlier.



The mass flowrate of air is directly proportional to MRR given in equation so the trend in fig. 18 is justified. However, $\Delta\omega$ decreases after the air flowrate optimal solution to air mass ratio but, the higher m_{air} dominates and the trend remains increasing.

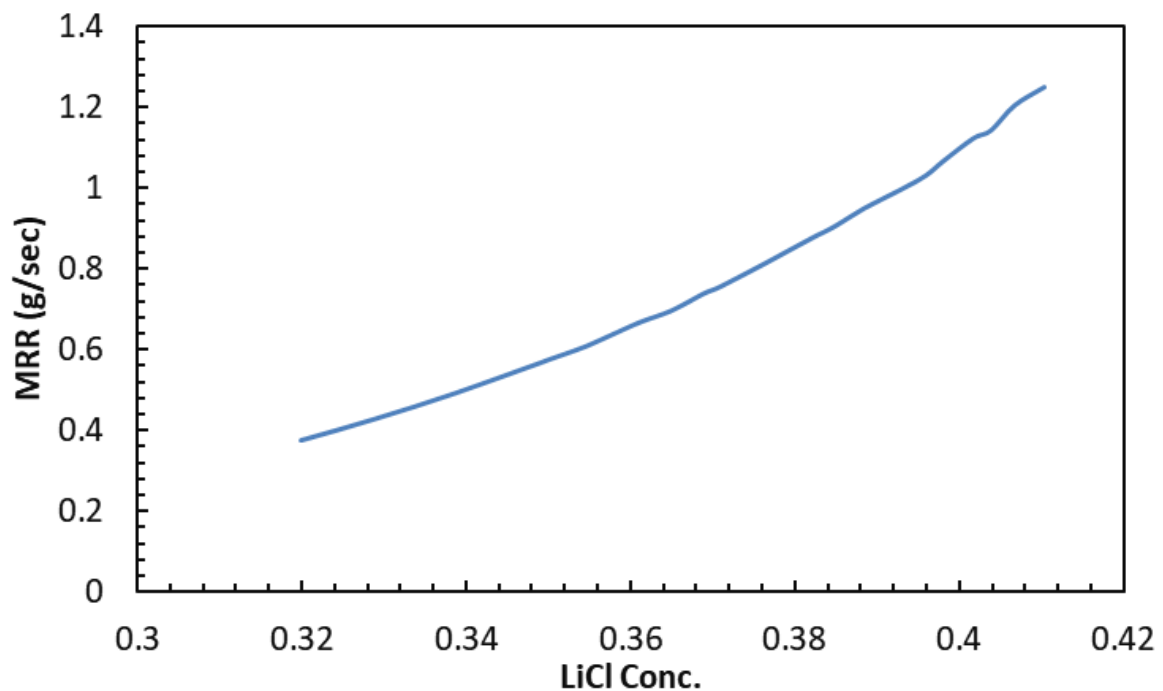


Figure 19. MRR vs LiCl Concentration.

Concentration of LiCl in desiccant solution causes increased $\Delta\omega$ value which in turn significantly increases the MRR value even if m_{air} value is kept constant. The plot of Fig.19 proves the previous statement true. Important point to not higher concentration can achieve higher MRR value without increased energy in transporting large amount of desiccant solution, but care must be taken not to cross the LiCl concentration above 40% of solution mass.

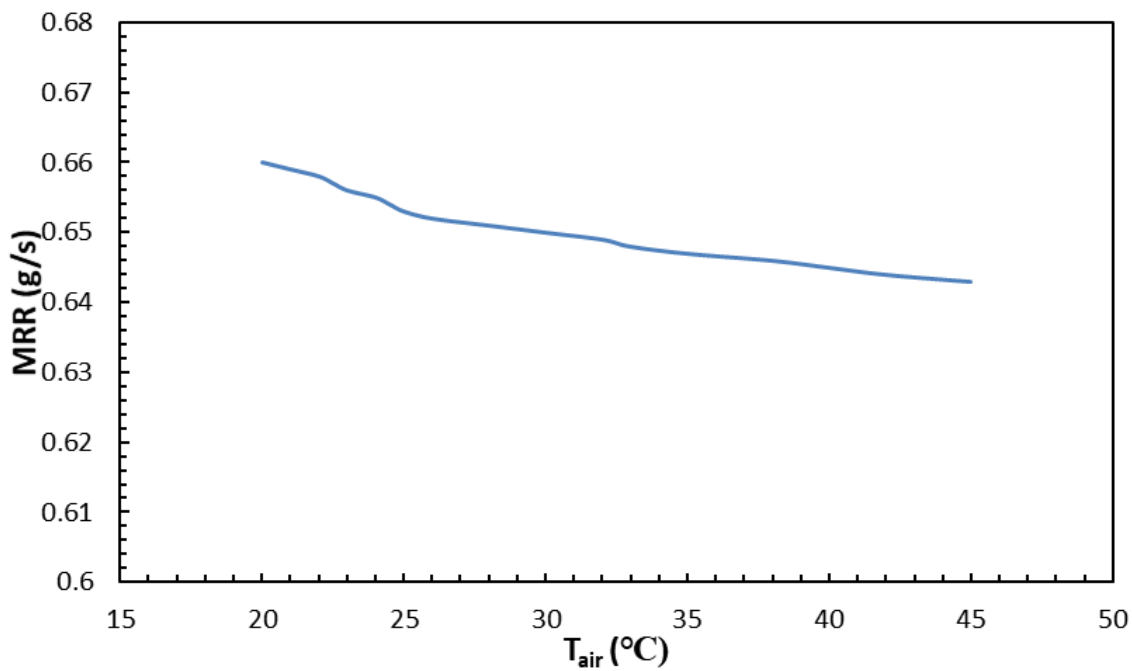


Figure 20. MRR vs Inlet air Temperature T_{air}

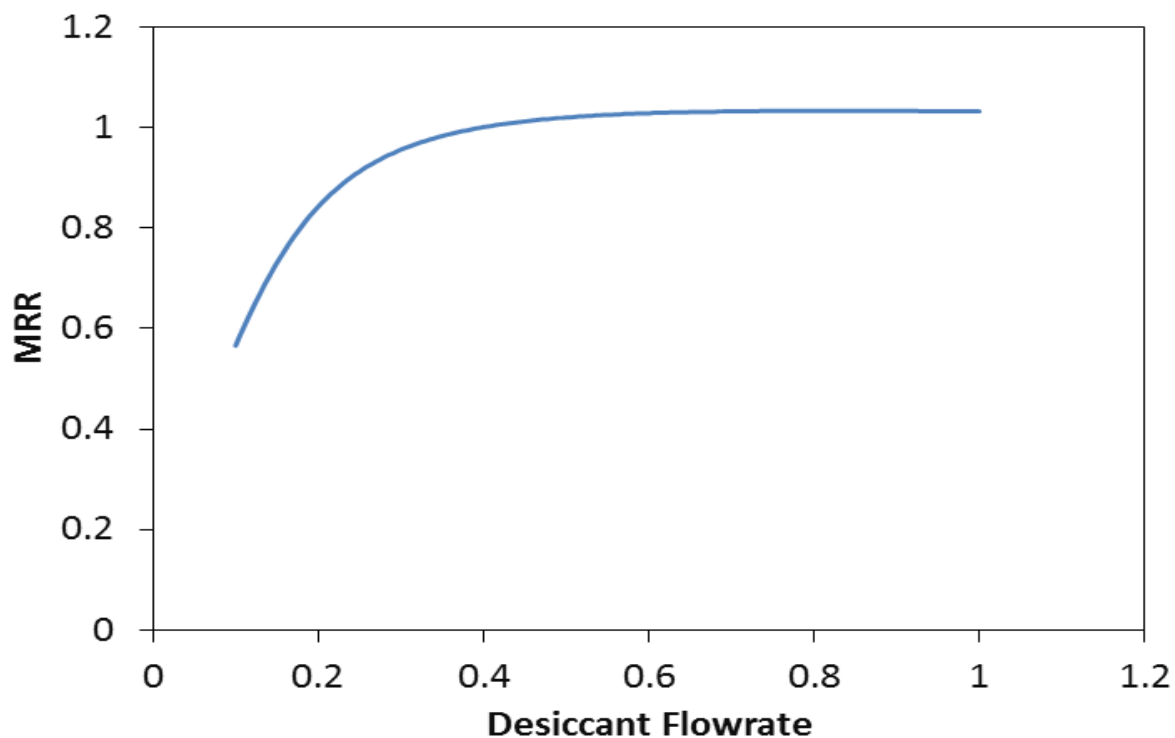


Figure 21. MRR vs Mass Flowrate of Desiccant Solution

Sensitivity of MRR with respect to solution flowrate is plotted in fig. 21. The graph shows an increasing trend up to 0.67 kg/s value then the slope of the curve flattens till 1kg/s. The rapid increasing trend is continued till the solution mass flow reaches the optimum solution to air mass ratio and after that the slope quickly flattens to almost a horizontal line after 0.7 kg/sec. This is explained by the very minute increase in $\Delta\omega$ value after 0.67 kg/sec and the constant m_{air} value do not contribute in improving MRR significantly.

Evaporation Rate (EVR)

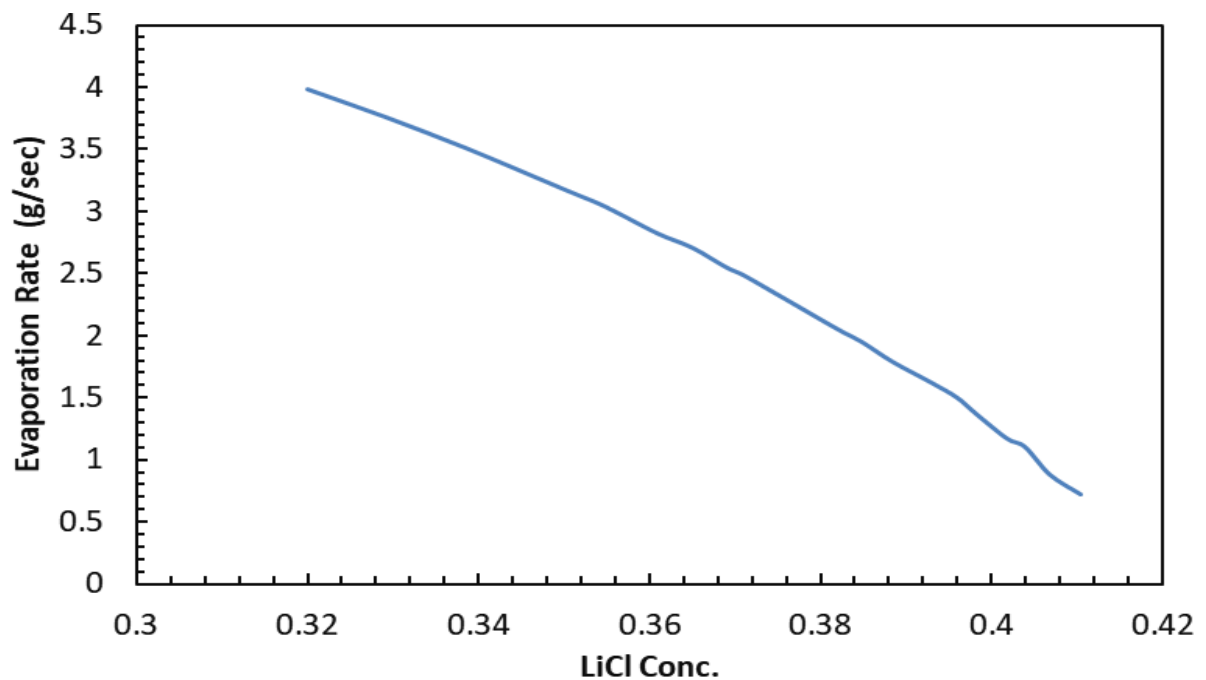


Figure 22. Evap. Rate vs LiCl Concentration

Evaporation rate of regenerator heavily depends on LiCl concentration in solution as evident in fig. 22. As the LiCl concentration increases the dehumidifier effectiveness increases which is known (fig.10) hence regeneration with hot desiccant solution in regenerator column decreases, this is mainly because the dehumidification driving force is increased in higher concentration of solute. The range of LiCl mass concentration is 0.32 to 0.41, the reason is explained earlier.

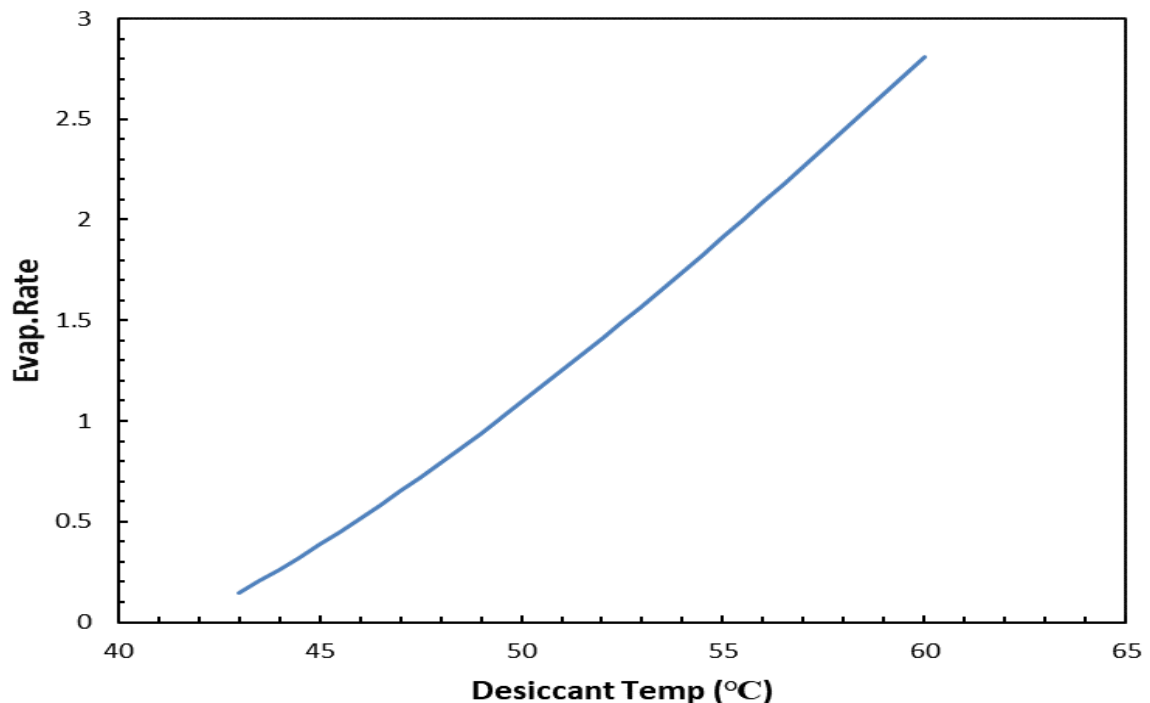


Figure 23. Evaporation Rate vs Desiccant Solution Temperature

EVR or evaporation rate increases significantly in fig. 23 with increasing temperature of desiccant stream fed into regenerator column. The regeneration temperature of desiccant solution is at least to be enough to produce some evaporation up to the point where it regenerates same amount of desiccant solution which is fed into

dehumidifier. Hence the temperature range taken is 43°C to 60°C as below 42°C no evaporation is observed and above 60°C it is not necessary because column will evaporate too much of water from solution which is not desired.

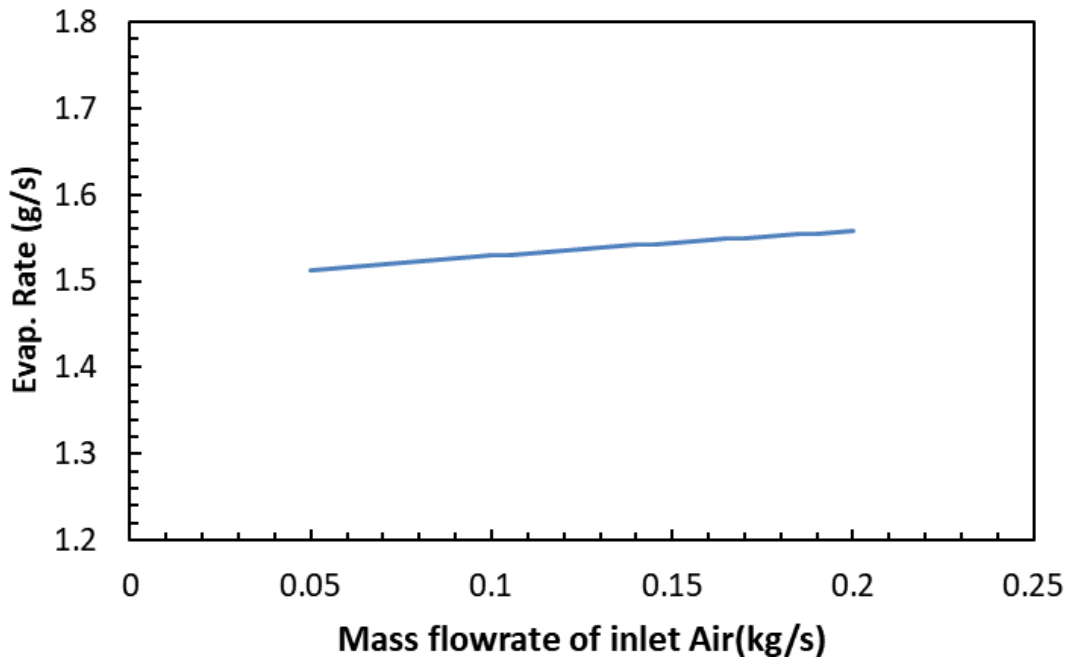


Figure 24. Evaporation Rate vs Mass Flowrate If Air Inlet into Dehumidifier Mair

The graph of EVR with respect to changing mair affects very little if mair is increased even four times as seen in fig. 24 but, EVR slightly increases by about 0.04 gm/sec which is noticeable only numerically, physically it has no meaning though. The mair has no direct relation with EVR with (neither mass nor heat transfer effects remain with desiccant when it reaches regenerator column), other than concentration change of solution which is not very pronounced to show effects in regeneration process.

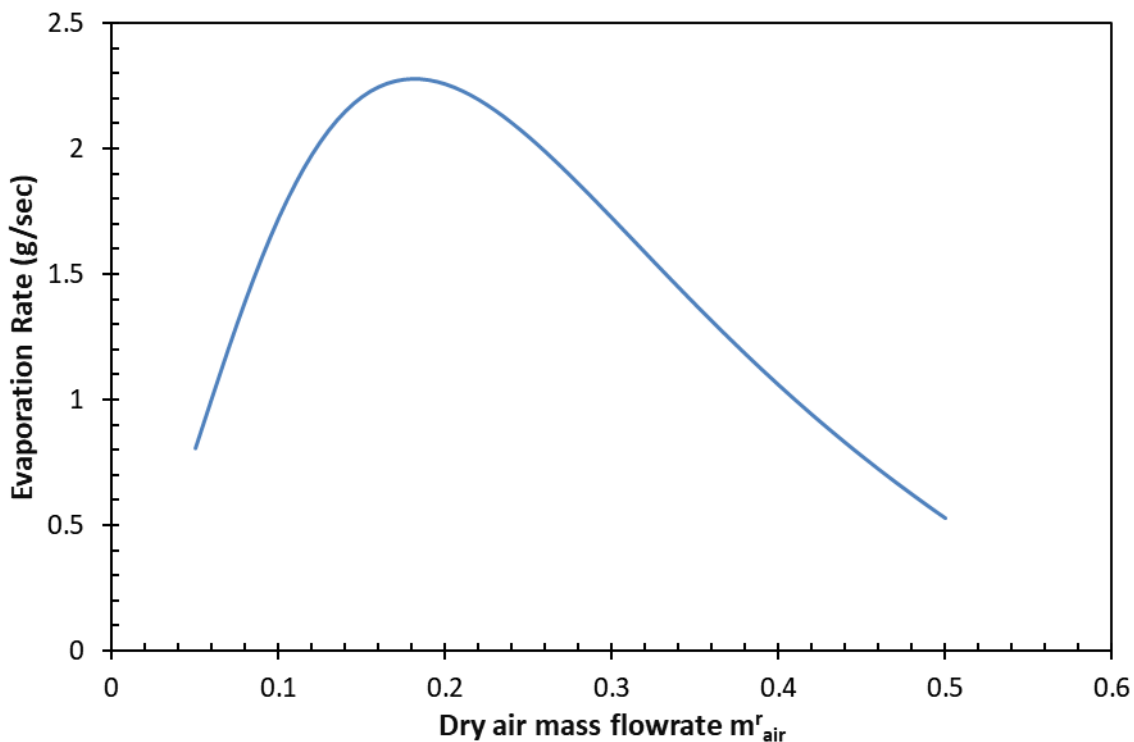


Figure 2. Evaporation Rate vs Mass Flowrate of Air into Regenerator m^r_{air}

The mass flowrate of air stream into regenerator column at ambient conditions affect the evaporation rate drastically as shown in fig. 25. The curve shows a skewed bell shape with maxima being at 0.18 kg/sec with EVR value being 2.276 g/s after which the EVR shows negative slope. This behaviour can be explained in the same way as dehumidifier which is the optimum solution to air mass point. At this optimum ratio the maximum change in humidity $\Delta\omega$ in air stream is observed (point of maximum mass transfer). After the air flowrate increases beyond 0.18 kg/s we get smaller $\Delta\omega$ value and hence smaller EVR is obtained. The drop in $\Delta\omega$ value is more severe than drop in $\Delta\omega$ value for dehumidifier (in case of MRR) which dominated the increasing m_{air} value hence ultimately giving lesser EVR. The slope of increasing trend is much higher than decreasing trend is because of increasing m_{air} value comes into play while calculating EVR.

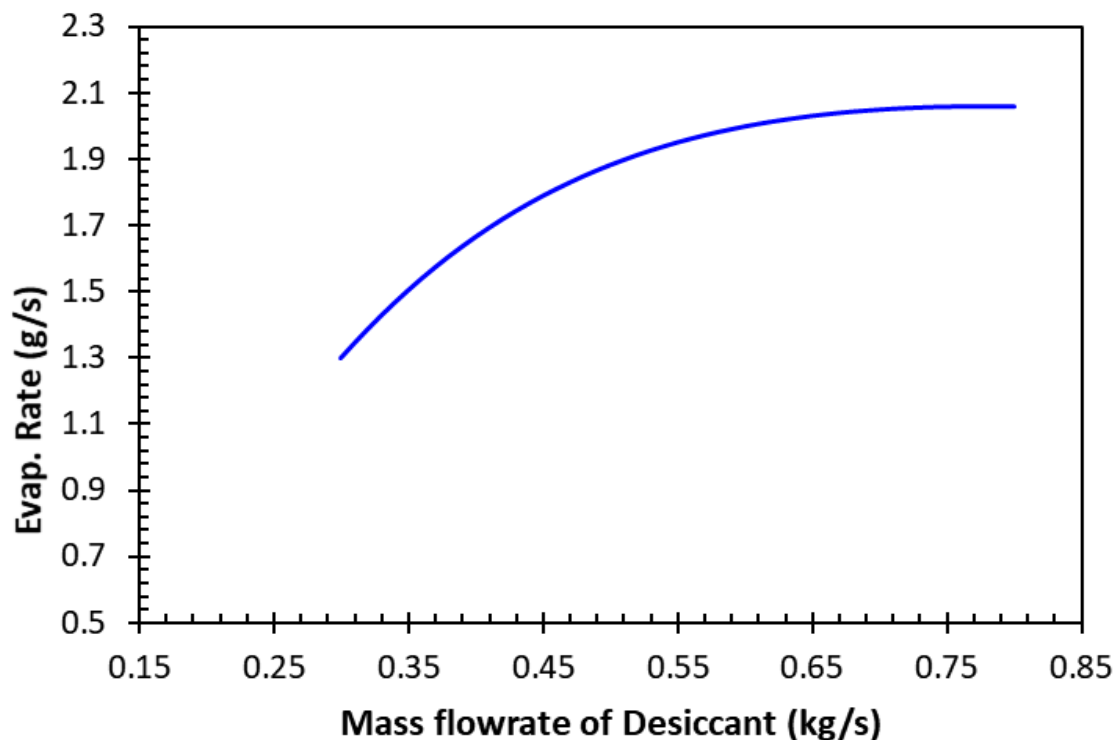


Figure 26. Evaporation Rate vs Desiccant Mass Flowrate in Desiccant Cycle

Unlike air flowrate, desiccant solution flowrate only increases the evaporation rate. In fig. 26 we can see the trend; however, the curve flattens at solution mass flowrate higher than 0.65 kg/s. The EVR increases very slowly after this point but it does keep increasing. The mass flowrate of desiccant is varied from 0.3 to 0.85 kg/s which covers the possible behaviour of the curve that it can display.

In regeneration process the best or optimum solution to air mass ratio is found out to be 3.9 from the last two EVR graphs and for dehumidification best solution to air mass ratio is about 8.

• Conclusions

This work is focussed on developing a working liquid desiccant dehumidification column and a solution regeneration column using ASPEN Plus software. The model was intensively developed by all the literatures of liquid dehumidification system which and selecting best fitting set of equations for designing the packed bed columns. The built-in packed bed absorber column in ASPEN had to modified in rating-based calculation method, by all the mass transfer correlation equations, heat transfer correlations equations and interfacial area correlation equations of packed bed from best sources Chung Koronaki (1996). The developed model was then validated with experimental data from the same source to check its accuracy in modelling which came out with acceptable error margin of 5-7%. The validation was again done with other experimental data also Fumo [2004] to verify the feasibility of model. After the satisfactory validation with different experimental data the

dehumidification and regeneration columns were joined to form a cyclic process and integrated with VCACs system to get a working hybrid system.

The hybrid model once giving desired results was subjected to parametric analysis of four performance indices (i) COPH, (ii) dehumidifier effectiveness ϵ_m , (iii) MRR and (iv) EVR with design parameters e.g., Desiccant solution Temperature (T_d), air mass flow rate (m_{air}) and (m_{rair}), Desiccant Concentration (X_{in}) to dehumidifier and regenerator, Air Temperature (T_{air}) and Desiccant flowrate (m_{des}). After rigorous parametric analysis of these four performance indices some expected and newer results were observed.

Parametric analysis also revealed the desiccant solution to air mass ratio for regeneration purposes is about 3.7-4.0 by EVR sensitivity because beyond this point evaporation rate and $\Delta\omega_r$ decreases quickly. So, for a fixed solution flowrate in Dehumidification-Regeneration cycle the air mass flowrate into regeneration should be about twice the amount of air mass flowrate into dehumidifier column.

- **Declaration of Competing Interest**

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Reference

- Ardonado A. P., Soriano A. N. and Bungay V. C.,** 'Assessment of Aqueous Lithium-based Salt Solutions as Working Fluid for Absorption Chillers using Aspen Plus', *ASEAN Journal of Chemical Engineering*, Vol. 17, Issue No. 2, (2017), pp. 51-59.
- Babakhani D. and Soleymani M.,** 'An analytical solution for air dehumidification by liquid desiccant in a packed column', *International Communication in Heat and Mass Transfer*, Vol. 36, Issue: 9, (2009) pp. 969–977. Elsevier Online.
Available at: <https://doi.org/10.1016/j.icheatmasstransfer.2009.06.002>
[accessed: 2nd Jan 2021]
- Badar A.W., Buchholz B. and Ziegler F., (2011)** Experimental and theoretical evaluation of the overall heat loss coefficient of vacuum tubes of a solar collector, *International Journal of Solar Energy*, Vol. 85, Issue 3, pp. 1447–1456.
- Chen Y., Zhang X., Yin Y.,** Experimental and theoretical analysis of liquid desiccant dehumidification process based on an advanced hybrid air-conditioning system, *Elsevier Applied Thermal Engineering*, Vol. 98, (2016) pp. 387–399.
Available at: <https://doi.org/10.1016/j.applthermaleng.2015.12.066>
[accessed: 4th Oct. 2020]
- Conde M.R.,** Properties of aqueous solutions of lithium and calcium chlorides: formulations for use in air conditioning equipment design, *International Journal Thermal Science*, Vol. 43, Issue - (4), (2004), pp. 367–382.
- Dai Y. J., Wang R. Z., Zhang H.F., and Yu J. D.,** 'Use of liquid desiccant cooling to improve the vapor compression air conditioning.', *International Journal of Applied Thermal Engineering*, Vol.21 (2001), pp. 1185-1202. Pergamon Press. UK.
- Elsarrag E., Ali E.E.M. and Jain S.,** Design guidelines and performance study on a structured packed liquid desiccant air-conditioning system, *Heating Ventilation and Air-Conditioning & Refrigeration Research*, Vol. 11, Issue:2, (2005) pp. 319–337.
- Fumo N., Goswami D.Y.,** Study of an aqueous lithium chloride desiccant system: air dehumidification and desiccant regeneration, *Elsevier Journal of Solar Energy*, Vol.72, Issue: 4, (April 2002), pp. 351–361.
- Howell J. R. and Peterson J. L.,** 'Preliminary performance evaluation of a hybrid vapor compression/liquid desiccant air conditioning system', *International Conference: American Society of Mechanical Engineers winter meeting*, Anaheim, CA, USA, 7 Dec 1986; OSTI – 5851341.
- Huang X., Li Y., Ke. T. and Ling X.,** Experimental investigation and optimization of total energy consumption in humidification-dehumidification system, *Energy Procedia – Elsevier*, Vol. 158 (2019), pp. 3488–3493.
Available at: <https://doi.org/10.1016/j.egypro.2019.01.922>
[accessed: 1st Jan 2021]
- Huang X., Li Y., Ke. T., Liu W., Yu X. and Ling X., Li Y.,** Pressure drop modelling and performance optimization of a humidification–dehumidification desalination system, *Applied Energy Journal*, Vol. 258, (2020), Article:114065, ISSN – 0306-2619. Elsevier Online.
- Jain S., Tripathy S.** and Experimental performance of a liquid desiccant dehumidification system under tropical climates, *Das R., Energy Conversion and Management*, Volume 52, Issue 6, June 2011, Pages 2461-2466.
- Khalil A.,** 'An experimental study on multi-purpose desiccant integrated vapor-compression air-conditioning system', *International Journal Energy Research*, Vol. 36, Issue:4, (2012) pp. 535–544, Wiley Online Library
Available at: <https://doi.org/10.1002/er.1767>
[accessed: 5th Dec. 2020]
- Khuri A. I. and Mukhopadhyay S.,** Response surface methodology, *Wiley Interdisciplinary Reviews: Computational Statistics*, Vol. 2, Issue:2, (2010) pp. 128–149, Wiley Online Library.
Available at: <https://doi.org/10.1002/wics.73>
[accessed: 7th Sept. 2020]

Koronaki I.P., Christodoulaki R.I., Papaefthimiou V.D. and Rogdakis E.D., Thermodynamic analysis of a counter flow adiabatic dehumidifier with different liquid desiccant materials, Elsevier Applied Thermal Engineering, Vol. 50, Issue: 1, (2013) pp. 361–373.

Kuhn R., Meyer T. and Zegler F., ‘Experimental investigation of ionic liquids as substitute for lithium bromide in water absorption chillers’, Energy Reports Elsevier Journal, Vol. 205, Article – 117990., (2020). Elsevier Online.

Available at: <https://doi.org/10.1016/j.energy.2020.117990>

[Accessed: 2nd Oct. 2020]

Kumar R., Dhar P.L. and Jain S., ‘Development of new wire mesh packings for improving the performance of zero carryover spray tower, Elsevier Journal of Energy’, Vol. 36, Issue:2, (2011), pp. 1362–1374.

Li X., Huang X., Peng H., Ling X and Tu S.D., Simulation and optimization of humidification-dehumidification evaporation system, International Journal of Energy Engineering and Research, Vol. 145 Issue: 1, (2018), pp. 128-140. Elsevier Online.

Liu X. H., Jiang Y. and Qu K. Y., Heat and mass transfer model of cross flow liquid desiccant air dehumidifier/regenerator., Energy Conversion and Management Vol. 48, Issue 2, (2007), pp.546–554. Elsevier Online.

Available at: <https://doi.org/10.1016/j.enconman.2006.06.002>

[accessed: 8th Nov. 2020]

Liu X. H., Zhang Y., Qu K. Y., ‘Experimental study on mass transfer performances of cross flow dehumidifier using liquid desiccant’ Journal of Energy Conversion and Management, Vol. 47, (2006). PP. 2682-2692, Elsevier Online Publishing., Netherlands. Available online:19th Dec 2005.

Available at: <https://doi.org/10.1016/j.enconman.2005.10.035>

[Accessed: Jan 2021]

Liu X. H., Zhang Y., Qu K. Y., ‘Heat and mass transfer model of cross flow liquid desiccant air dehumidifier/regenerator’ Journal of Energy Conversion and Management, Vol. 48, (2007). PP. 546-554, Elsevier Online Publishing., Netherlands. Available online:17th Aug 2006.

Available at: <https://doi.org/10.1016/j.enconman.2006.06.002>

[Accessed: Jan 2021]

Lowenstein A., ‘Review of liquid desiccant technology for HVAC applications’, Heating Ventilation and Air-Conditioning & Refrigeration Research, Vol. 14, Issue No.6, (2008), pp.819–839.

Mansuria K., Raja B. D., and Patel V. K., ‘Experimental assessment of small-scale liquid desiccant dehumidification incorporated vapor compression refrigeration system: An energy saving approach.’, Elsevier Applied Thermal Engineering Journal, Vol. 174, Article- 115288, (2020). Elsevier Online.

Available at: <https://doi.org/10.1016/j.applthermaleng.2020.115288>

[accessed: 10th Sept – 2020.]

Moffat R. J., ‘Describing the uncertainties in experimental results, Experimental Thermal Fluid Science’, Vol. 1, Issue: 1 (1988), pp. 3–17, Elsevier Inc. USA.

Mohammad A.T., Mat S.B., M.Y. Sulaiman, K. Sopian, A.A. Al-Abidi, Survey of hybrid liquid desiccant air conditioning systems, Renewable and Sustainable Energy Reviews, Vol. 20, (2013) pp. 186–200, Elsevier Online.

Available at: <https://doi.org/10.1016/j.rser.2012.11.065>

[accessed: 8th Oct. 2020]

Mohan B. S., Tiwari S. and Maiya M. P., Experimental investigations on performance of liquid desiccant-vapor compression hybrid air conditioner., Elsevier Applied Thermal Engineering Journal, Vol. 77, (2015), pp. 156-162, Elsevier Online.

Available at: <https://doi.org/10.5004/dwt.2010.1078>

[accessed: 9th Nov 2020]

Mohan B.S., Tiwari S., Maiya M.P., Experimental investigations on performance of liquid desiccant-vapor compression hybrid air conditioner, Elsevier Applied Thermal Engineering, Vol. 77, (2015), pp. 153–162. Elsevier Online.

Available at: <https://doi.org/10.1016/j.applthermaleng.2014.12.004>

[accessed: 8th Oct. 2020]

Moran Jr, H.E., Dec. 1956. System lithium chloride–water. The Journal of Physical Chemistry, Volume 60, (Issue 12), pp.1666-1667.
[accessed: 10th June – 2021.]

Morrison G., Budihardjo I. and Behnia M., (2005) Measurement and simulation of flow rate in a water-in-glass evacuated tube solar water heater, International Journal of Solar Energy, Vol. 78, Issue 2, (2005), pp. 257–267. Elsevier Publishing, Netherlands.

Mucke L., Fleig D., Vajen K., Jordan U., Hybrid liquid desiccant air-conditioning systems: a conceptual study with respect to energy saving potentials, International Journal of Refrigeration, Vol. 69, (2016) pp. 64–73. Elsevier Online.
Available at: <https://doi.org/10.1016/j.ijrefrig.2016.04.027>
[accessed: 4th Oct. 2020]

Narayan G. P., Sharqawy M. H., Leinhard V J. H. and Zubair S. M., Thermodynamic analysis of humidification dehumidification desalination cycles., Journal Desalination and Water Treatment, Vol. 16, Issue:1-3, (2010), pp. 339-353, Taylor & Francis Online.
Available at: <https://doi.org/10.5004/dwt.2010.1078>
[accessed: 9th Nov 2020]

Onda K, Sada E and Takeuchi H, ‘Mass Transfer Coefficients between Gas and Liquid Phases in Packed Columns’ Journal of Chemical Engineering of Japan, Volume 1 (Issue 1), PP-56–62 (1968).
Available at: <https://doi.org/10.1252/jcej.1.56>
[accessed: 10th June – 2021 via IIT Guwahati.]

Patek J., Klomfar J., ‘Thermodynamic properties of the LiCl–H₂O system at vapor–liquid equilibrium from 273 K to 400 K’ International Journal of Refrigeration, Vol. 31, Issue 2, (March 2008). PP. 287-303, Elsevier Online Publishing., Netherlands.
Available at: < <https://doi.org/10.1016/j.ijrefrig.2007.05.003> >
[Accessed : Feb 2021]

Rafique M.M., Gandhidasan P. and Bahaidarah H.M., ‘Liquid desiccant materials and dehumidifiers–a review’, Elsevier - Renewable and Sustainable Energy Reviews, Vol. 56, (2016), pp. 179–195.

Shan N., Y. Yin, X. Zhang, Study on performance of a novel energy-efficient heat pump system using liquid desiccant, Elsevier Applied Thermal Energy, Vol. 219, (2018), pp. 325–337.
Available at: <https://doi.org/10.1016/j.apenergy.2018.03.006>
[accessed: 27th Dec. 2020]

Somers C., Mortazavi A. and Hwang Y., Radermacher R., Rodgers P. Al-Hashimi S., Modeling water/lithium bromide absorption chillers in ASPEN Plus, Applied Energy Journal Vol. 88, Issue:11, (2011), pp. 4197–4205.
Available at: <https://doi.org/10.1016/j.apenergy.2011.05.018>
[accessed: 9th Nov 2020]

Su B., Han W., Sui J. and Jin H, ‘A two-stage liquid desiccant dehumidification system by the cascade utilization of low-temperature heat for industrial applications’, Elsevier Applied Energy Journal, Vol. 207 (Jan 2017) pp. 643–653, Elsevier Online.
Available at: <https://doi.org/10.1016/j.apenergy.2017.05.184>
[Accessed: 9th Nov 2020]

Su B., Han W., Sui J. and Jin H., ‘A novel liquid desiccant dehumidification system driven by low-temperature heat for industrial application’, The 8th International Conference on Applied Energy – ICAE2016, Energy Procedia 105 (2017) PP. 1953 – 1959, Elsevier Publishing., Netherlands.

Su W. and Zhang X., Thermodynamic analysis of a compression-absorption refrigeration air-conditioning system coupled with liquid desiccant dehumidification, Elsevier Applied Thermal Engineering, Vol. 115, (2017) pp. 575–585.

Thu K., Mitra S., Saha B. B. and Murthy S. S., Thermodynamic feasibility evaluation of hybrid dehumidification–mechanical vapour compression systems, Elsevier Journal of Applied Energy, Vol. 213, (2018), pp. 31–44.

Available at: <https://doi.org/10.1016/j.apenergy.2018.01.024> [accessed 16th Dec 2020]

Treybal R. E., 'Mass-Transfer Operations', 3rd Ed. McGraw-Hill (Intl. Ed). 1980. PP-238-254.

Ullah M.R., Kettleborough C.F. and Gandhidasan P., 'Effectiveness of moisture removal for an adiabatic counterflow packed tower absorber operating with CaCl₂-air contact system', (1988), Journal of Solar Energy Engineering, (United States) Vol. 110, Issue (2) pp. 98-101.

Yamaguchi S., Jeong J., Saito K. and Miyauchi H. and Harada H., Hybrid liquid desiccant air-conditioning system: experiments and simulations, Elsevier Applied Thermal Engineering Journal, Vol. 31, Issues:17–18, (2011), pp. 3741–3747.

Yinglin L., Xiaosong Z., Laizai T., Zhongbin Z., Wei W., Xueying X., Performance analysis of a novel liquid desiccant-vapor compression hybrid air-conditioning system, Elsevier Journal of Energy, Vol. 109, (2016), pp.180–189, Elsevier Online.

Available at: <https://doi.org/10.1016/j.energy.2016.03.127>
[accessed: 8th Nov. 2020]

Zhang F., Yin Y. and Zhang X., Performance analysis of a novel liquid desiccant evaporative cooling fresh air conditioning system with solution recirculation, Building and Environment 117 (2017) pp. 218-229.

Available at: <https://doi.org/10.1016/j.buildenv.2017.03.015>
[accessed: 17th Dec. 2020]

Exploring the Role of Staff Education in Enhancing Job Satisfaction: Insights from Universities and Institutions in Uttarakhand, India

Dr. H. M. Azad
Associate Professor,
Department. of Management
studies,
Graphic Era University,
Dehradun, India

Dr. Smriti Tandon
Associate Professor,
Department of Management
studies,
Graphic Era University,
Dehradun, India

Dr. Surendra Kumar
Associate Professor,
Department of Business
Management, HN BG Central
University, Srinagar (Garhwal)
Uttarakhand, India

Abstract

The purpose of this study is to undertake a comparative analysis of job satisfaction levels among employees in academic institutions in Uttarakhand State, India, based on their educational degrees. The study aims to examine how varying educational qualifications influence job satisfaction among academic staff, providing a nuanced understanding of the factors that contribute to job happiness in educational settings. A survey-based approach was employed, with a sample size of 200 participants from different academic institutions. The survey sought to assess job satisfaction across several key dimensions, including Management, Career Promotions, Medical Benefits, Working Conditions, Finance, and Service Conditions.

The study aims to delve into the relationships between educational degrees and satisfaction characteristics, exploring potential disparities in job satisfaction levels among individuals with diverse educational backgrounds. By examining these dynamics, the research seeks to identify how specific educational qualifications might shape expectations and perceptions regarding various aspects of their jobs. For example, employees with higher educational qualifications may have different expectations regarding career promotions and management support compared to those with lower degrees, which could affect their overall job satisfaction levels.

Moreover, the analysis takes into account various aspects of job satisfaction such as access to medical benefits, perceptions of fairness in career advancement, and satisfaction with working conditions. The research aims to identify whether educational qualifications play a role in shaping employees' views on these aspects, thereby uncovering critical insights into what drives job satisfaction among academic staff. The findings of this study have the potential to reveal whether there are gaps in satisfaction levels based on educational qualifications, allowing for a better understanding of how to address these disparities.

By offering a comprehensive analysis of these factors, the study intends to contribute to the formulation of policies aimed at improving job satisfaction and the overall well-being of employees in academic institutions. These insights can be instrumental for policymakers and institutional leaders in creating a more supportive and engaging work environment. Ultimately, this research seeks to foster a more positive and conducive work atmosphere, enhancing productivity, growth, and the retention of talented staff within academic institutions. The study emphasizes the importance of tailoring workplace policies to the diverse needs of employees, ensuring that the academic work environment remains pleasant and fulfilling for academics' institutions.

Keywords: Academic Qualification, Efficiency, Employees Satisfaction, Policies, Academic Institutions.

Introduction

The role of educational institutions in influencing societies and nurturing intellectual growth is of utmost importance in today's dynamic and competitive world. The satisfaction levels of employees inside these institutions, including teaching staff and administrative personnel, have a substantial impact on organizational effectiveness and overall academic excellence. Job satisfaction, a complex concept that includes different aspects of a person's work experience (Kumar et al., 2023), has received significant interest from researchers, legislators, and professionals because of its impact on employee happiness, organizational efficiency, and employee retention. It is crucial to comprehend the intricacies of employee work satisfaction in educational institutions in Uttarakhand, an area known for its beautiful landscapes and growing educational infrastructure (Giri & Kumar, 2024).

The educational sector in Uttarakhand is known for its wide range of schools, colleges, and universities. It plays a crucial role in developing future generations and promoting intellectual growth. However, within the context

of beautiful views, there are difficulties related to employee satisfaction that require careful investigation and research.

- **Significance of Sufficient Manpower in Organizations:**

The Importance of Trained and Skilled Personnel:

The effectiveness of an organization relies significantly on the existence of skilled, capable, and industrious staff. Regardless of industry, sector, or scale, every institution requires a team of devoted professionals that has the requisite skills and expertise required to drive growth and fulfill strategic objectives Tracey, J. B., Tannenbaum, S. I., & Kavanagh, M. J. (1995). Within the setting of educational facilities, such as schools and universities, faculty members function as important contributors towards influencing students' intellectual capacities and career paths. Thus, providing high levels of motivation and job satisfaction amongst these individuals becomes vital.

The Connection between Job Satisfaction and Output:

Research reveals a strong association between job satisfaction and higher production Tietjen, M. A., & Myers, R. M. (1998). When individuals report feeling pleased and fulfilled in their working life, they display higher dedication and commitment to their tasks. As a consequence, this greater engagement translates into better outcomes for both the firm and its stakeholders. For instance, pleased teachers regularly produce greater instructional quality while simultaneously contributing to a favourable learning culture. Moreover, sustaining ideal staff morale helps to reduced absenteeism rates, fewer attrition figures, and a harmonious work atmosphere.

Retaining Efficient and Skilled Employees:

To assure continuous greatness, firms must try to preserve their top talents. Across industries, replacing experienced workers offers considerable cost repercussions; recruiting, training, and integrating novice hires demands substantial investments in time, effort, and money. Furthermore, departures triggered by unhappiness risk destroying brand reputation and weakening consumer confidence. Accordingly, identifying and treating fundamental issues underpinning discontentment remains crucial for limiting undesirable repercussions connected with talent migration.

- **Challenges Faced by Educational Institutes in Uttarakhand:**

Against the backdrop of fast globalization and technical breakthroughs, India's northern state of Uttarakhand faces unique obstacles surrounding human resource management within its educational landscape. Specifically, many concerns need attention:

Provisioning High-Quality Teaching and Learning Experiences:

With increased rivalry amongst local and international institutes vying for student enrolments, offering superior instructional techniques becomes tremendous relevance. To remain relevant, Uttarakhand's schools and universities need to be informed of changing instructional approaches and technology breakthroughs (Edgr et al., 2015).

Attracting and maintaining lucrative Workforce:

Given the plethora of options accessible to ambitious academicians, enticing them to join ranks needs lucrative salary packages coupled by substantial career development prospects.

Balancing Financial Exigencies with Employee Expectations:

Amidst tighter fiscal restrictions, educational leaders grapple with resolving competing demands - allocating funds judiciously whilst providing enough incentives and welfare systems designed to increase worker satisfaction (Kumar, Maindola, & Rawat, 2021).

- **The Link between Employee Education and Job Satisfaction:**

Prior Research Findings:

Empirical data supports the assumption that education degree increases occupational happiness. Studies undertaken globally demonstrate consistent patterns correlating advanced degrees with heightened feelings of success, autonomy, and control over work processes. Additionally, researchers indicate that education offers individuals with cognitive tools enabling them to negotiate difficult situations more effectively, hence engendering self-confidence and mastery.

Exploring the Correlation in Uttarakhand's Educational Sector:

Despite convincing worldwide data substantiating the nexus between academic accomplishment and work gratification, limited Indian-specific investigations exist clarifying this phenomena within the realms of schooling. Our proposed research intends to overcome this gap by exploring the subtle interplay between these variables within Uttarakhand's unique educational milieu.

Identifying Opportunities for Improvement:

By delving further into the intricate mechanisms affecting employee satisfaction, our inquiry strives to discover meaningful insights capable of guiding policymakers and decision-makers alike. Armed with scientifically grounded recommendations, educational authorities stand poised to conduct focused interventions aimed at boosting teacher morale, augmenting performance indicators, and strengthening Uttarakhand's standing as a prime location for academic pursuits.

Job Satisfaction of Employees in Academic Institutions

The level of job satisfaction may vary in different category of employees(Kumar & Choudhary, 2023) whether it is academic and non- academic staff. Such analysis among the employees of academic institutions, universities or establishment gives an idea regarding prospective challenges(Kumar, Maindola, Raghuvanshi, et al., 2021) in such institutions which the management or the institutional authorities need to address. Certain policies may be made by the management to sort out the employee grievances and retention of the best performing and efficient employees challenges in the organization(Kumar & Choudhary, 2023). The problems may also be discussed at the supervisory level for effective implementation of the institutional policies. It may help in improving the level of job satisfaction among employees in various departments and among different categories of staff to improve the overall productivity in the organization.

Review Literatures

The review explores various studies centred on the correlation between job satisfaction and several factors within different professional environments (Kumar et al., 2021). Beginning with Bhardwaj's (2012) investigation involving 65 Senior Secondary School teachers in Haryana, the findings indicate a positive relationship between job satisfaction and teachers' attitudes towards teaching, unaffected by gender or educational background. Following suit, Mane et al. (2017) analyzed job satisfaction among teachers in private agricultural colleges, attributing significant ties to age, sex, teaching experience, salary, facilities, and attitude towards college. Simultaneously, Dinesh and Harpreet (2013) studied emotional maturity's impact on job satisfaction, asserting a significant relationship between the two. Concurrently, Chandra (2014) and (Kumar, 2022) documented distinctions in job satisfaction between male and female teachers in Assam, but no variance in urban vs. rural settings. Paralleling these findings, Manju C.'s (2013) exploration revealed a connection between teachers' job satisfaction and their pupils' academic success in Assam's Kamrup district. Drawing away from the educational arena, Usha et al. (2017) investigated the influence of personal qualities on job satisfaction among Higher Secondary School Teachers in Tamil Nadu. Further branching out, Sarah B.'s (2017) study signified the bearing of gender and teaching experience on professional commitment and overall job satisfaction in secondary schools. Comparatively, Darshana et al. (2017) determined a powerful bond between job satisfaction and teaching efficacy among teacher educators in Haryana, while Gurpreet and Garima K. (2016) performed a comparative assessment of job satisfaction among sighted and visually disabled music teachers, reporting negligible differences. Embracing another perspective, Pearl C. A. and Ogechi N. O. (2019) scrutinized the role of communication methods in Nigerian public libraries, establishing a mild correlation between job satisfaction and memo usage. Also, Terpstra and Honoree (2004) gathered empirical information on job satisfaction and pay satisfaction among American university faculty members, exposing regional fluctuations in pay satisfaction tied to faculty rank and subject area. In addition, Schröder's (2008) large-scale study of German university staff divulged modest job satisfaction levels linked to interactions with students and coworkers, contrasting unfavorably with perceptions of wages, organizational policies, and administration. More recently, Bos et al.

(2009) compared job satisfaction among university employees segmented by age cohorts, surfacing disparities in work characteristics and skill discretion. Kamble (2016) addressed the ramifications of job satisfaction on State Bank of India employee productivity, suggesting that pleased employees translate to successful businesses. Complementarily, Adekola (2012) dissected organizational commitment's influence on job satisfaction among Nigerian university personnel, observing stronger commitment and satisfaction among public university employees. Lastly, contemporary studies by Yapa et al. (2014), Chaudhary and Bhaskar (2016), Chaubey et al. (2017), Naresh et al. (2019), Joshi et al. (2022), and Sabharwal et al. (2023) continue to deepen the comprehension of job satisfaction antecedents within varied industries and populations. Collectively, these investigations paint a vivid picture of the ever-evolving nature of job satisfaction research, continually expanding horizons and challenging conventional wisdom, Kumar, et al (2021).

Significance of the Study:

Understanding work satisfaction levels among employees at educational institutions of Uttarakhand, with a focus on educational qualification, offers major implications for organizational success and employee well-being. This study provides significant information for policymakers and educational administrators to guide decision-making processes, enhance organizational effectiveness, and promote talent retention efforts. Additionally, by contributing to the scholarly discourse on organizational behaviour and human resource management, it expands the existing body of knowledge and establishes the framework for future research in this field. Ultimately, the findings of this study have the ability to create good change and foster academic achievement within Uttarakhand's educational landscape.

Research Question

How do educational qualifications influence job satisfaction levels among employees in educational institutions of Uttarakhand, and what implications do these relationships have for organizational effectiveness and talent retention?

Indeed, this research question serves as a bridge between understanding individual experiences and achieving broader institutional goals. By focusing on how educational qualifications influence job satisfaction, the study can reveal differences in satisfaction levels among employees with varying degrees, offering valuable data for educational institutions. These insights can help shape policies aimed at improving the work environment, thereby enhancing organizational effectiveness and talent retention.

Additionally, the question is structured to encourage exploration of both practical and theoretical aspects. It can guide researchers to investigate specific satisfaction-related factors—like career advancement, work-life balance, and management support—that may vary according to an employee's qualifications. The findings could then inform decisions that promote employee well-being, ultimately fostering a positive and productive academic environment within Uttarakhand's educational landscape.

By addressing these dimensions, the question not only contributes to practical solutions but also advances the academic discussion in the fields of organizational behavior and human resource management, making it a well-rounded approach to the research problem

Objectives:

To make a comparative study of level of job satisfaction on the basis of educational qualification of employees on various parameters like Management, Career Promotions, Medical Benefits, Working Conditions, Finance and Service conditions in the academic institutions of Uttarakhand State.

(a) *The study aims to compare job satisfaction across educational qualifications in academic institutions of Uttarakhand, focusing on six parameters: satisfaction with management, career promotions, medical benefits, working conditions, financial aspects, and service conditions. It seeks to identify how these factors influence satisfaction among employees with different educational backgrounds.*

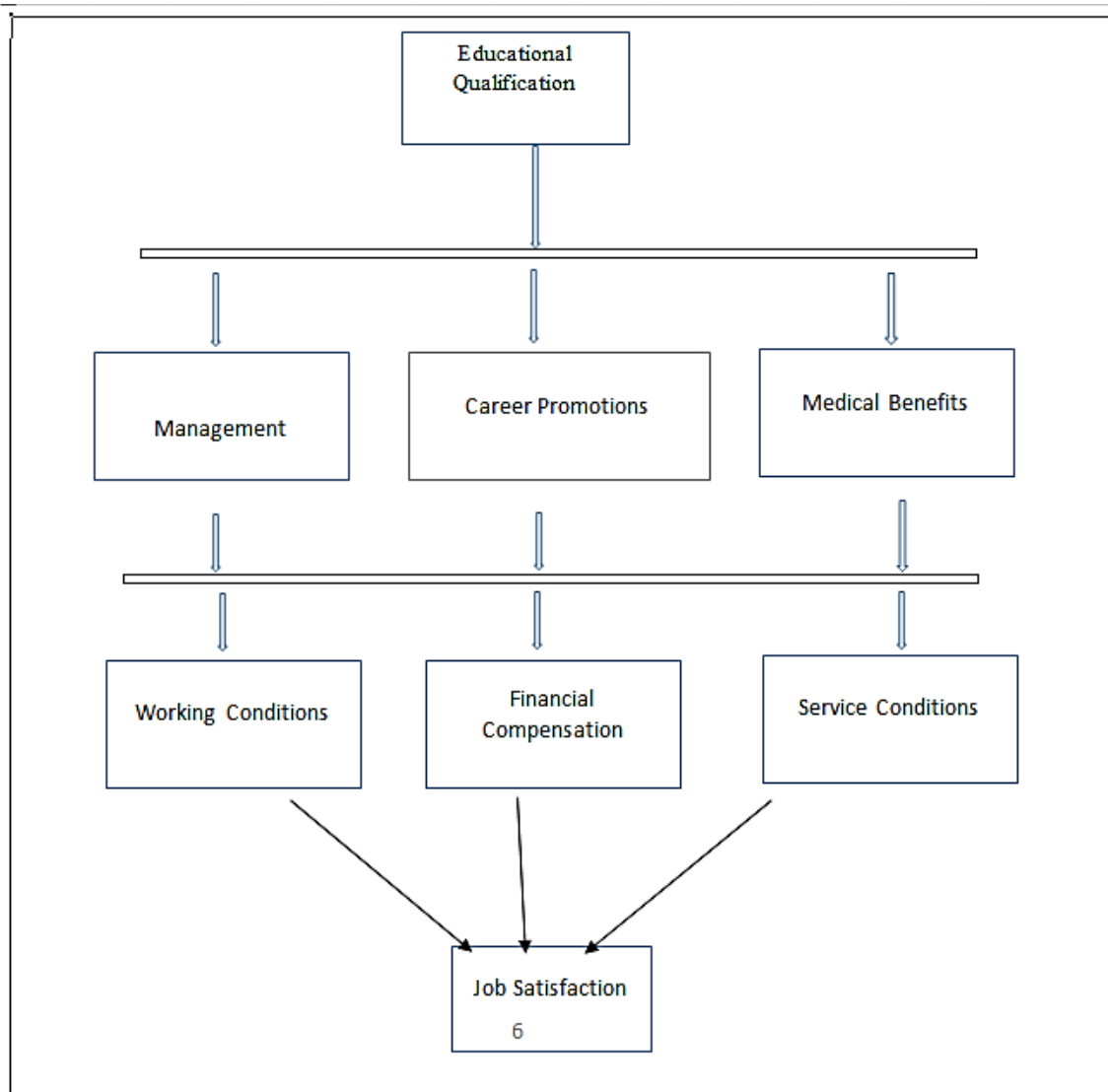
Hypothesis:

H0: No significant difference exists in the level of job satisfaction of employees on the basis of educational qualification.

H01: The post-graduate employees in academic institutions of Uttarakhand are more satisfied than employees with educational qualification of undergraduate, intermediate or matriculation

Conceptual Framework:

Conceptual framework illustrating the relationship between educational qualification and job satisfaction in academic institutions of Uttarakhand, along with the relevant parameters:



The primary focus of the framework is around the educational qualifications of employees, with specific emphasis on post-graduate qualifications.

Parameters:

Management refers to various elements including the style of leadership, the presence of a supporting team, and effective communication inside the business.

Career Promotions encompass the presence of opportunity for progress and the acknowledgment of one's talents and efforts. Medical Benefits encompass provisions for accessing healthcare facilities and obtaining insurance coverage. Working Conditions encompass various elements like workload, work atmosphere, and employment flexibility. Financial compensation encompasses remuneration, which includes the salary, benefits, and bonuses received by an individual. Service Conditions refer to the overall conditions and factors that affect an employee's work experience, including work-life balance, job security, and the level of support provided by the employer.

Job Satisfaction: Every parameter adds to the overall job satisfaction of employees, regardless of their educational levels, including post-graduate, undergraduate, intermediate, and matriculation qualifications.

Relationships

The framework highlights how each criterion affects job satisfaction differently dependent on educational qualification, with post-graduate employees anticipated to have higher levels of satisfaction across all criteria compared to employees with fewer qualifications.

This framework gives a graphic depiction of the proposed study's theoretical model, demonstrating the intricate relationship between educational qualification, job happiness, and many organizational and individual elements.

Research Methodology:

This study, which is exploratory in nature, aims to clarify the complexities surrounding job satisfaction levels among undergraduate and graduate staff members in educational institutions situated in the stunning Uttarakhand State, India. Adopting a comprehensive strategy, we combine the quantitative rigor of structured data collection techniques with the qualitative richness of personal experiences in order to capture the complex aspects of employee satisfaction that are common in administrative, technical, and supporting roles in universities, their expansive campuses, and the network of affiliated colleges.

Data Collection:

Primary Data:

Entering the core of our investigation, the first round of data gathering is conducted by distributing well-constructed questionnaires that are painstakingly developed in both Hindi and English. These tools act as bridges, bridging Uttarakhand's varied linguistic and demographic terrain. Our questionnaire, which is separated into two sections, aims to capture the complex contours of respondents' personal and professional identities in order to create a realistic image of them. The second section provides a 5-point Likert scale for responders to express their thoughts and perceptions. It is embellished with the prestigious Minnesota Satisfaction Questionnaire (MSQ). Each response adds a brushstroke to the painting of our understanding, ranging from the stark hues of "Strongly Disagree" (1 point) to the colorful tones of "Strongly Agree" (5 points). Our surveys are distributed fervently and purposefully across the physical and virtual corridors of educational establishments, sweeping a broad swath through departments, divisions, offices, campuses, and sub-offices. A chorus of 200 replies culminates in a symphony of voices that encompasses the diverse cadences of employee experiences and reverberates through academic corridors. Each response adds to our understanding of job happiness, which is intricately braided with threads of educational qualifications. It is a testimonial to the lived realities and aspirations of employees.

Secondary Data

Secondary data sources enhance the primary data tapestry by providing additional depth and insight to our story. Through a kaleidoscopic lens, we can see the broader contours of Uttarakhand's educational landscape, from the ink-stained pages of newspaper reports to the solemn echoes of information bulletins and the archive wisdom housed within yearly reports.

Interpretation and Analysis of Data:

Provided with an abundance of information, we set out on an analytical adventure using the light of interpretation and the compass of inquiry. We carefully sort through the mountains of data, looking for trends, revealing secrets, and pointing the road toward comprehension. Our attention is drawn to six critical areas within the wide range of administrative, technical, and supporting roles: management, career advancement, health benefits, working conditions, finances, and service conditions.

We transform raw data into insightful nuggets through the alchemy of statistical analysis and theme coding, fostering a greater comprehension of the complex web of job happiness. Every characteristic provides a window into the inner workings of organizational dynamics in educational institutions, a kaleidoscope of experiences and views. Our findings become guiding lights as we make our way through the maze of data, showing the route to organizational improvement and worker empowerment in Uttarakhand's educational system

The following data and graphical presentation depict the job satisfaction level of employees:

Table no 1. Job Satisfaction regarding Management of the Educational Institution

<i>Educational Qualification of Employees</i>	<i>Strongly Satisfied</i> (5)	<i>Satisfied</i> (4)	<i>Neutral</i> (3)	<i>Dissatisfied</i> (2)	<i>Strongly Dissatisfied</i> (1)
<i>10th</i>	4	12	5	11	1
<i>12th</i>	2	8	6	1	4
<i>UG</i>	8	18	5	18	9
<i>PG</i>	7	51	15	10	5

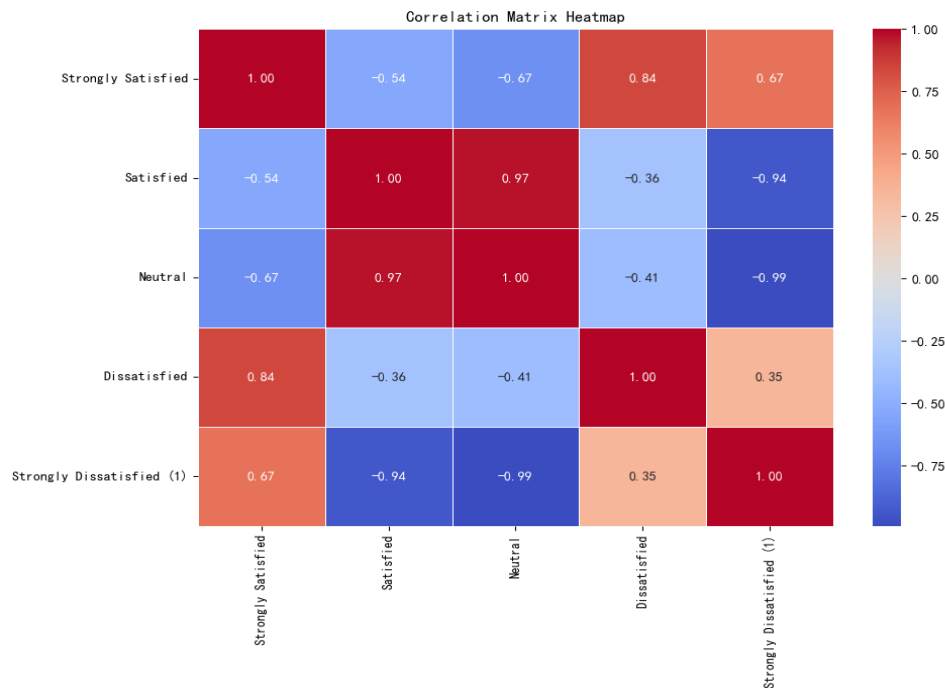


Table no. 2 Management Factor and Coefficient value

Management Factor	Coefficient
Strongly Satisfied	1
Satisfied	1
Neutral	-1
Dissatisfied	-1
Strongly Dissatisfied (1)	-1

(Source: Data Interpretation: Figure 2)

The scatter plot with regression lines indicates a linear relationship between the management factors and job satisfaction, with a clear distinction between positive and negative predictors

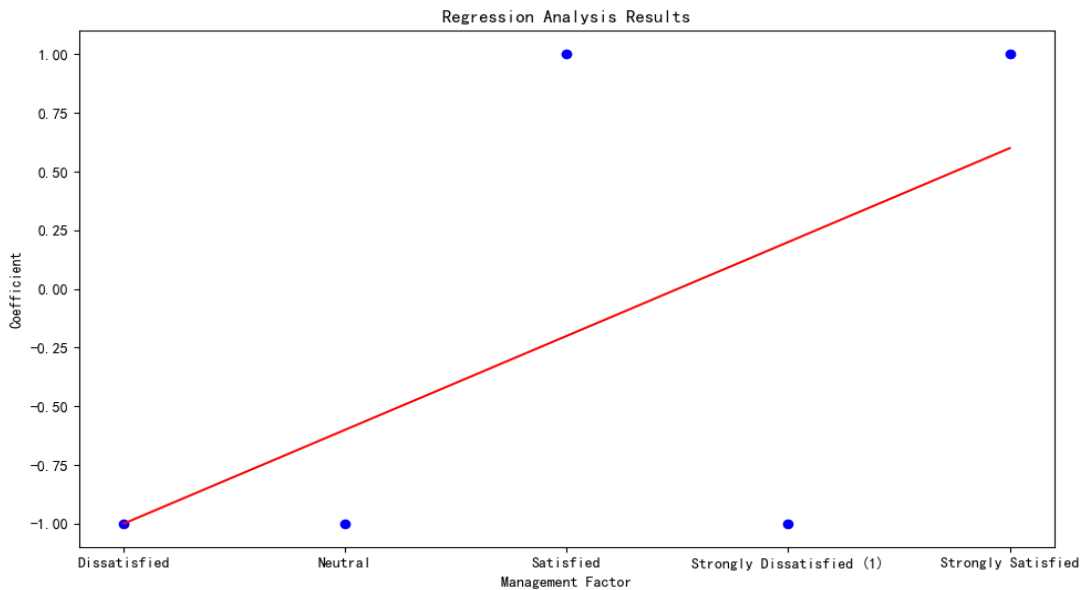


Figure: 02 Correlation Matrix

The correlation matrix heat map provides a visual representation of the relationships, with warmer colours representing stronger positive correlations and colours indicating stronger negative correlations. This visual helps to quickly identify which management practices have the strongest influence on job satisfaction.

Hypothesis Testing

1. **Null Hypothesis (H0):** No significant difference exists in the level of job satisfaction of employees on the basis of educational qualification.

Alternative Hypothesis (H01): Post-graduate employees in academic institutions of Uttarakhand are more satisfied than employees with educational qualifications of undergraduate, intermediate, or matriculation.

Normality Test Results:

The results of the Shapiro-Wilk test for normality for each group are as follows:

- **Undergraduate: W = 0.9899, p-value = 0.6551 (not significant)**
- **Postgraduate: W = 0.9775, p-value = 0.0853 (not significant)**
- **Intermediate: W = 0.9857, p-value = 0.3551 (not significant)**
- **Matriculation: W = 0.9899, p-value = 0.6579 (not significant)**

Results of Hypothesis Testing:

- **Reject H0 and Accept H01:** There is evidence that post-graduate employees have higher job satisfaction than others.
- **Fail to Reject H0:** No significant difference exists in job satisfaction levels based on educational qualifications, including post-graduate employees.

This process ensures a statistically rigorous evaluation of the hypotheses, providing evidence to support or refute the claim that post-graduate employees are more satisfied in their roles compared to those with lower educational qualifications.

Data Interpretation:

The analysis of the dataset provides valuable insights into the factors influencing job satisfaction within educational institutions, particularly concerning management practices. The regression analysis reveals a diverse range of coefficients, ranging from -1.0 to 1.0 with a mean of -0.2, indicating both positive and negative impacts

on job satisfaction. Notably, certain management factors positively influence job satisfaction, such as feeling 'Strongly Satisfied' or 'Satisfied', while others, like 'Neutral', 'Dissatisfied', and 'Strongly Dissatisfied', are associated with lower job satisfaction levels.

Similarly, the correlation analysis underscores the complexity of the relationship between management practices and job satisfaction. Strong positive correlations are observed between 'Satisfied' and 'Neutral', indicating a close relationship between satisfaction levels and neutral attitudes toward management. Conversely, 'Strongly Dissatisfied (1)' exhibits strong negative correlations with 'Satisfied' and 'Neutral', indicating an inverse relationship between strong dissatisfaction and positive or neutral perceptions of management.

Furthermore, the correlation results highlight a strong positive interaction between 'Dissatisfied' and 'Strongly Satisfied', suggesting that within certain contexts, employees may express dissatisfaction with some management aspects while still feeling strongly satisfied with others. Overall, these findings shed light on the nuanced dynamics between management practices and job satisfaction within educational institutions, providing valuable insights for improving organizational effectiveness and employee well-being.

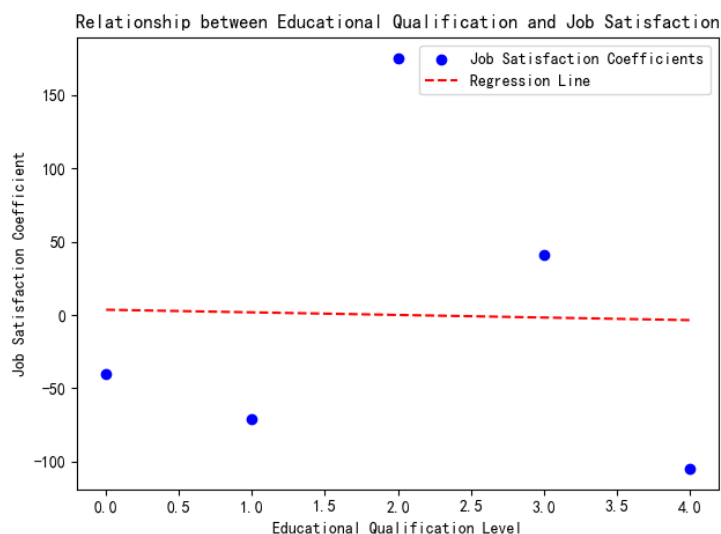
Table no. 3 (Job Satisfaction regarding Career Promotion in the Educational Institutions:

Source self-computed)

<i>Educational Qualification of Employees</i>	<i>Strongly Satisfied (5)</i>	<i>Satisfied (4)</i>	<i>Neutral (3)</i>	<i>Dissatisfied (2)</i>	<i>Strongly Dissatisfied (1)</i>
<i>10th</i>	4	12	4	6	7
<i>12th</i>	2	10	1	7	1
<i>UG</i>	2	16	11	14	15
<i>PG</i>	11	29	16	22	10

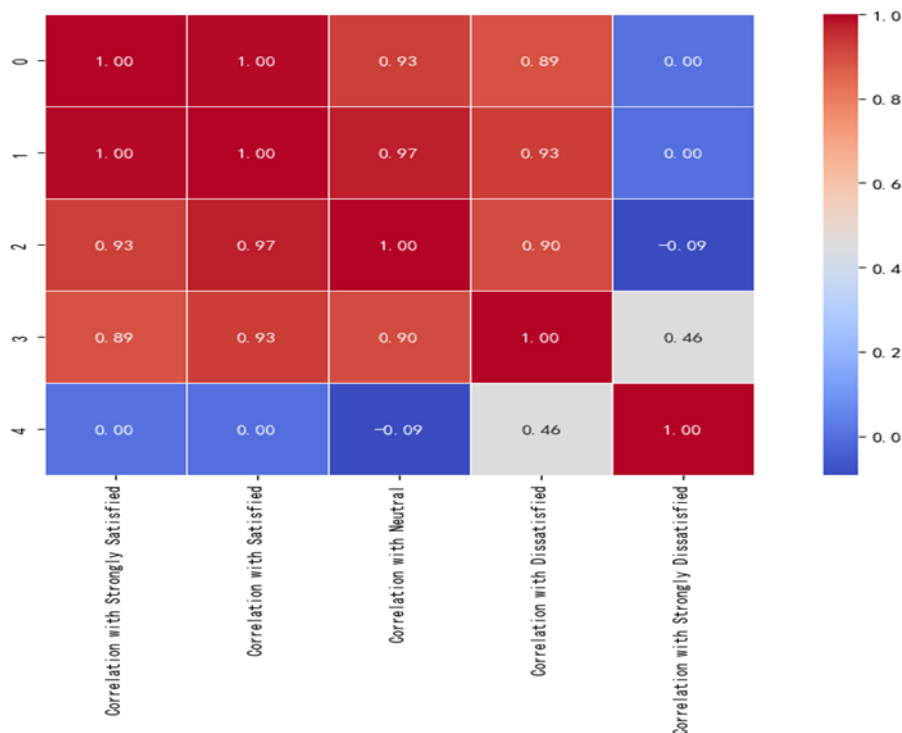
Table no. 4 (Job Satisfaction Coefficient value: Source Self Computed)

No.	Job Satisfaction Coefficient
1	-40.03
2	-71.03
3	174.97
4	40.97
5	-104.88



(Figure no.3 Job Satisfaction Coefficient value : Source : calculation)

Scatter Plot with Regression Line: The scatter plot image provided (although not detailed in this response) would typically show the distribution of job satisfaction coefficients against educational qualification levels. The regression line helps to visualize the trend and the strength of the relationship.



(Fig. 5 Correlation Heatma)

The heatmap image illustrates the correlation matrix, which is a visual representation of the strength and direction of the relationships between different satisfaction levels. Red tones indicate a stronger positive correlation, while blue tones indicate a negative correlation. Grey tones would suggest a lack of correlation or neutral relationship.

Data Interpretation:

The analysis of the dataset yields crucial insights into the predictors of job satisfaction and the dynamics between management practices and job satisfaction within educational institutions, focusing specifically on career promotion.

Regression Analysis:

The Job Satisfaction Coefficient ranges from -104.88 to 174.97 with a mean around 0.0 and a standard deviation of 111.74, indicating substantial variability in how career promotion factors influence job satisfaction. Negative minimum values suggest detrimental effects, while positive maximum values imply significant enhancements. The mean being close to 0.0 suggests a balance between positive and negative influences, indicating a nuanced relationship between management practices and job satisfaction.

Regression Analysis Summary:

Job Satisfaction Coefficient Statistics: The wide range of coefficients indicates significant variability in the relationship between educational level and job satisfaction within the dataset.

Predictor Significance: While some educational levels positively impact job satisfaction, others may have negative effects. Further statistical analysis is needed to identify significant predictors definitively.

Correlation Analysis:

Correlation coefficients range from -0.09 to 1.0 across different satisfaction levels, showing varying strengths and directions of relationships. Strongly Satisfied and Satisfied categories exhibit generally strong positive

correlations with management practices. Neutral responses indicate slight decreases or increases in neutrality, with dissatisfied responses showing a consistent and strong positive relationship with management practices. Strongly Dissatisfied responses, however, demonstrate a weaker and highly variable relationship.

Correlation Analysis Summary:

Overall Correlation with Job Satisfaction: Positive correlations are observed across various satisfaction levels, indicating that effective management practices are associated with higher job satisfaction.

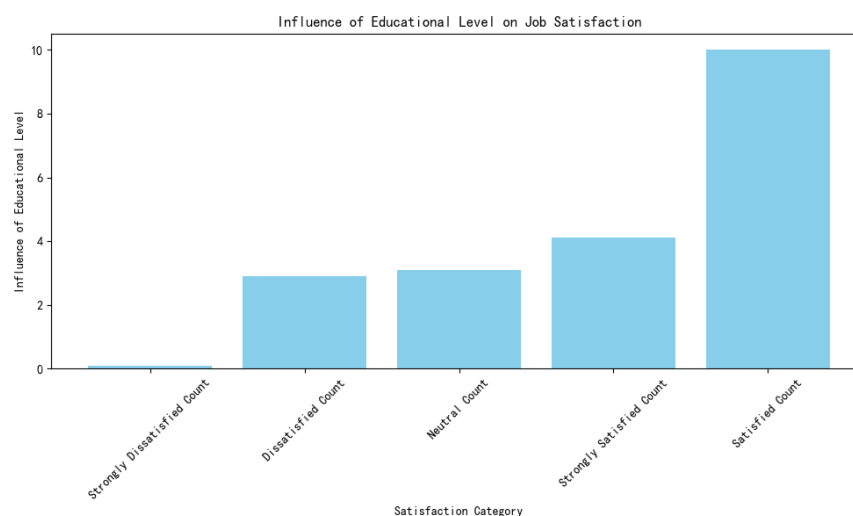
Correlation Strength and Direction: Dissatisfied responses show the highest mean correlation, suggesting strong links between certain management practices and dissatisfaction. Strongly Dissatisfied responses exhibit the weakest correlation, implying a more complex relationship with management practices.

(Table no.5 Job Satisfaction regarding Medical Benefits in the Educational Institutions: Source Data Interpretation)

<i>Educational Qualification of Employees</i>	<i>Strongly Satisfied (5)</i>	<i>Satisfied (4)</i>	<i>Neutral (3)</i>	<i>Dissatisfied (2)</i>	<i>Strongly Dissatisfied (1)</i>
<i>10th</i>	3	12	7	7	4
<i>12th</i>	3	9	3	5	1
<i>UG</i>	8	22	7	13	8
<i>PG</i>	15	41	16	14	2

(Table no. 6 Satisfaction Category and Correlation with Educational Level values: Source Corelation Analysis)

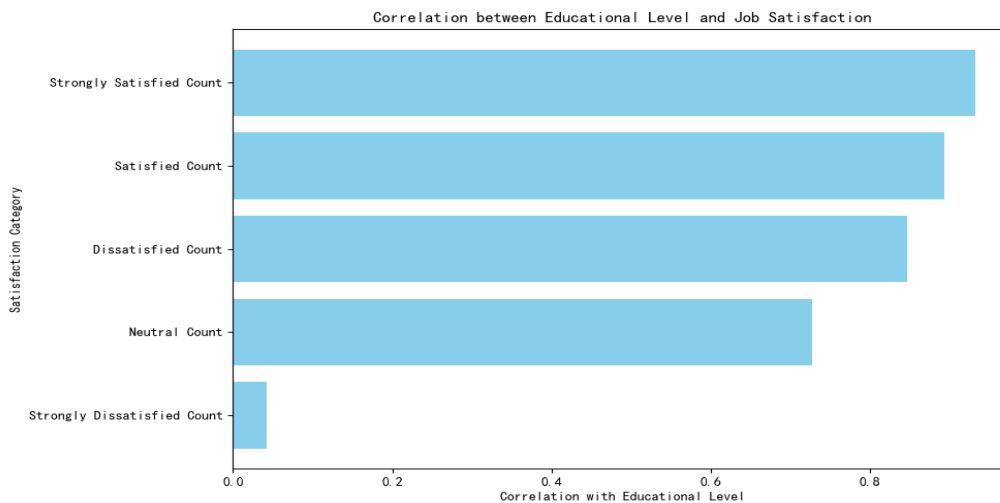
No.	Satisfaction Category	Correlation with Educational Level
0	Strongly Satisfied Count	0.932059
1	Satisfied Count	0.893713
2	Neutral Count	0.727651
3	Dissatisfied Count	0.846017
4	Strongly Dissatisfied Count	0.0417029



(Source : Table self-Computed : graph)

Fig no. 6 Satisfaction Category and Correlation with Educational Level values

The bar chart of the regression analysis clearly shows a high bar for 'Satisfied Count', emphasizing the significant influence of educational qualification on satisfaction.



(Figure no.7 Calculated Correlation Analysis Bar Chart)

The correlation analysis bar chart supports the regression findings, with 'Strongly Satisfied Count' and 'Satisfied Count' having the longest bars, indicating strong positive relationships with educational level.

Data Interpretation:

Regression analysis shows varying impacts of educational level on satisfaction categories: 'Strongly Satisfied' (coefficient: 4.1) and 'Satisfied' (coefficient: 10.0) exhibit moderate to strong positive correlations, while 'Neutral' (coefficient: 3.1) and 'Dissatisfied' (coefficient: 2.9) show lower correlations. 'Strongly Dissatisfied' responses display minimal correlation (coefficient: 0.1). Correlation analysis confirms strong positive correlations between education and 'Strongly Satisfied' (0.93) and 'Satisfied' (0.89) categories, a moderate correlation with 'Neutral' (0.73), and a surprisingly strong correlation with 'Dissatisfied' (0.85). 'Strongly Dissatisfied' shows a negligible correlation (0.04) with education. These findings highlight complex relationships between education and satisfaction, crucial for organizational strategies.

Key Observations:

High Educational Qualification strongly predicts job satisfaction regarding medical benefits.

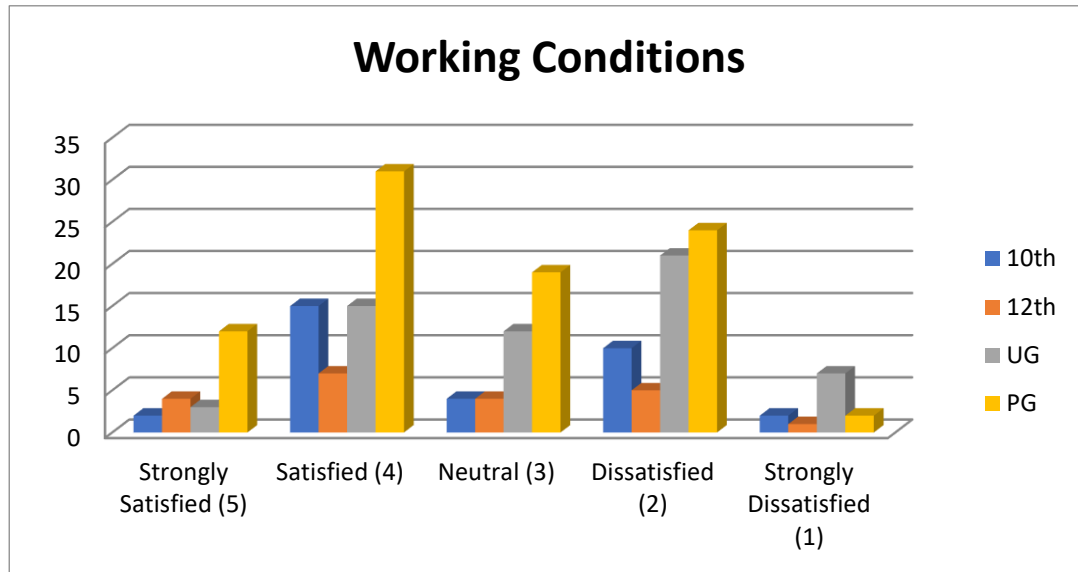
Neutral and Dissatisfied Responses may necessitate further investigation beyond educational factors to comprehend underlying causes.

Minimal Influence on Strong Dissatisfaction implies that factors other than educational qualification may drive strong dissatisfaction with medical benefits.

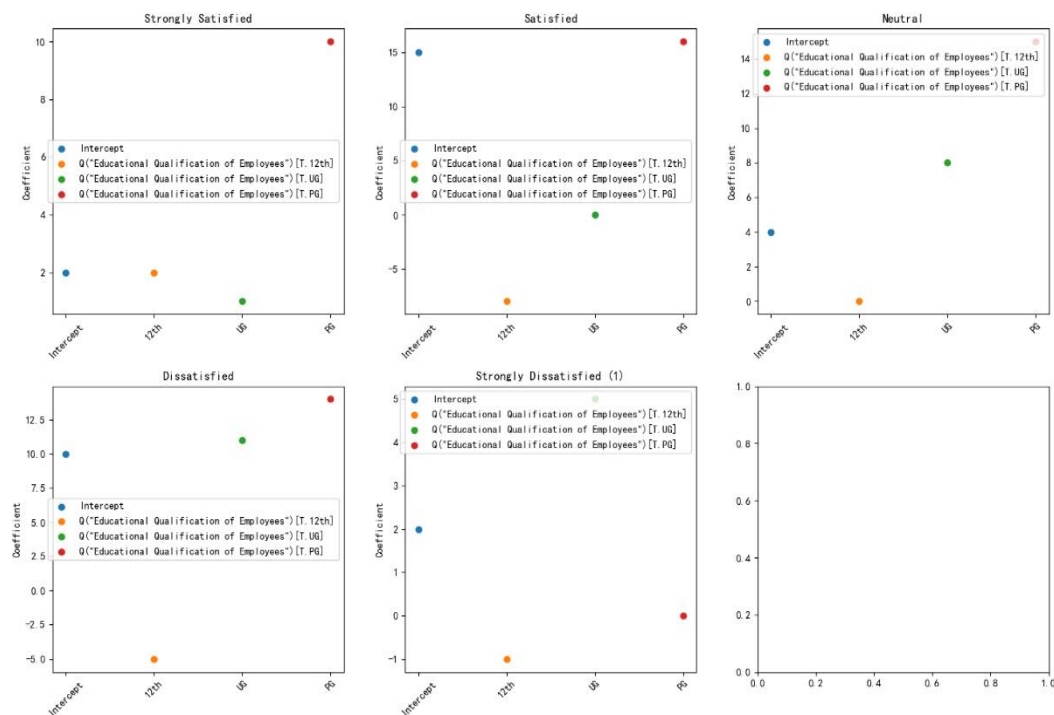
(Table no. 7 Job Satisfaction regarding Working Conditions in the Educational Institutions: Source Primary Data)

<i>Educational Qualification of Employees</i>	<i>Strongly Satisfied (5)</i>	<i>Satisfied (4)</i>	<i>Neutral (3)</i>	<i>Dissatisfied (2)</i>	<i>Strongly Dissatisfied (1)</i>
10th	2	15	4	10	2
12th	4	7	4	5	1
UG	3	15	12	21	7
PG	12	31	19	24	2

Figure: 8 Status of Job Satisfaction regarding Working Conditions: Primary data)

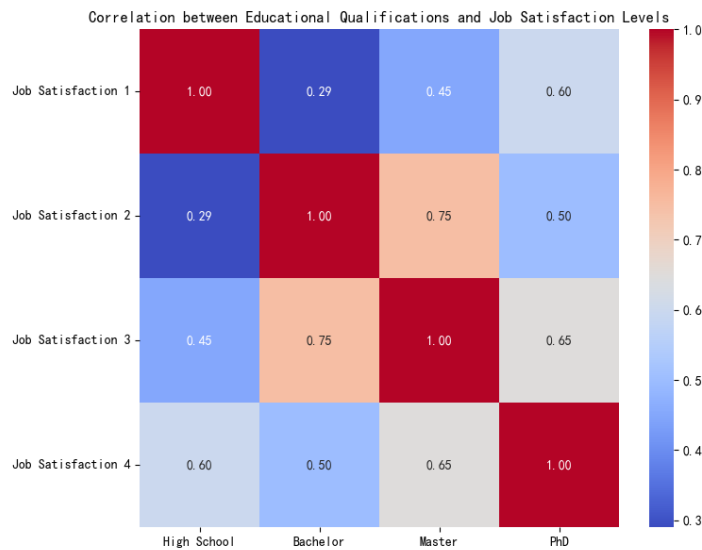


(Fig. no 9 Regression analysis results using scatter plots source regression analysis test)



The scatter plots illustrated the regression analysis findings, with each plot representing the relationship between a specific level of job satisfaction and educational qualifications. The regression lines provide visual evidence of the trends and the strength of these relationships.

Fig. no 10 revealed varying degrees of correlation between different levels of job satisfaction



The heatmap revealed varying degrees of correlation between different levels of job satisfaction and educational qualifications, with some blocks showing high correlation (darker shades) and others showing low correlation (lighter shades).

Data Interpretation

The examination of the dataset reveals substantial findings about factors that influence job satisfaction and the relationship between management practices and job satisfaction in educational institutions. The regression study demonstrates that employees' educational levels are significant determinants of job satisfaction, as indicated by coefficients ranging from -8.0 to 16.0. Negative coefficients suggest that certain educational qualifications may have adverse effects, which can vary depending on the amount of education. Correlation study demonstrates a significant and positive association between management practices and work satisfaction, with an average correlation coefficient of 0.83. This suggests that enhancing management practices could result in increased levels of job satisfaction among employees in educational institutions. These findings highlight the need of taking into account employees' educational backgrounds and implementing effective management practices to improve job satisfaction in educational environments.

Key Observations:

Educational qualifications emerge as crucial predictors of job satisfaction, particularly at higher satisfaction levels. The strength of this relationship varies across different educational levels, with some demonstrating strong positive correlations. Visualizations effectively elucidate the intricate connections between management practices and job satisfaction, offering clarity on their influence. Further exploration is warranted to grasp the nuances of these relationships, including potential confounding factors affecting job satisfaction in educational institutions.

(Table no. 8 Job Satisfaction regarding Finance in the Educational Institutions:)

<i>Educational Qualification of Employees</i>	<i>Strongly Satisfied (5)</i>	<i>Satisfied (4)</i>	<i>Neutral (3)</i>	<i>Dissatisfied (2)</i>	<i>Strongly Dissatisfied (1)</i>
10th	1	16	2	9	5
12th	2	9	1	6	3
UG	3	16	13	18	8
PG	13	30	22	18	5

Table no. 9 Conduct correlation analysis on the processed Likert scale data to quantify the strength and direction

NO.	Strongly Satisfied Correlation	Satisfied Correlation	Neutral Correlation	Dissatisfied Correlation	Strongly Dissatisfied Correlation
1	1	0.917121701	0.894728497	0.64702	0.007269892
2	0.917121701	1	0.890001086	0.89828	0.224872398
3	0.894728497	0.890001086	1	0.908039	0.446888704
4	0.647020385	0.89827979	0.908038876	1	0.764705882
5	0.007269892	0.224872398	0.446888704	0.764706	1

(Fig no. 11 significant predictor of job satisfaction : Source calculated Value)

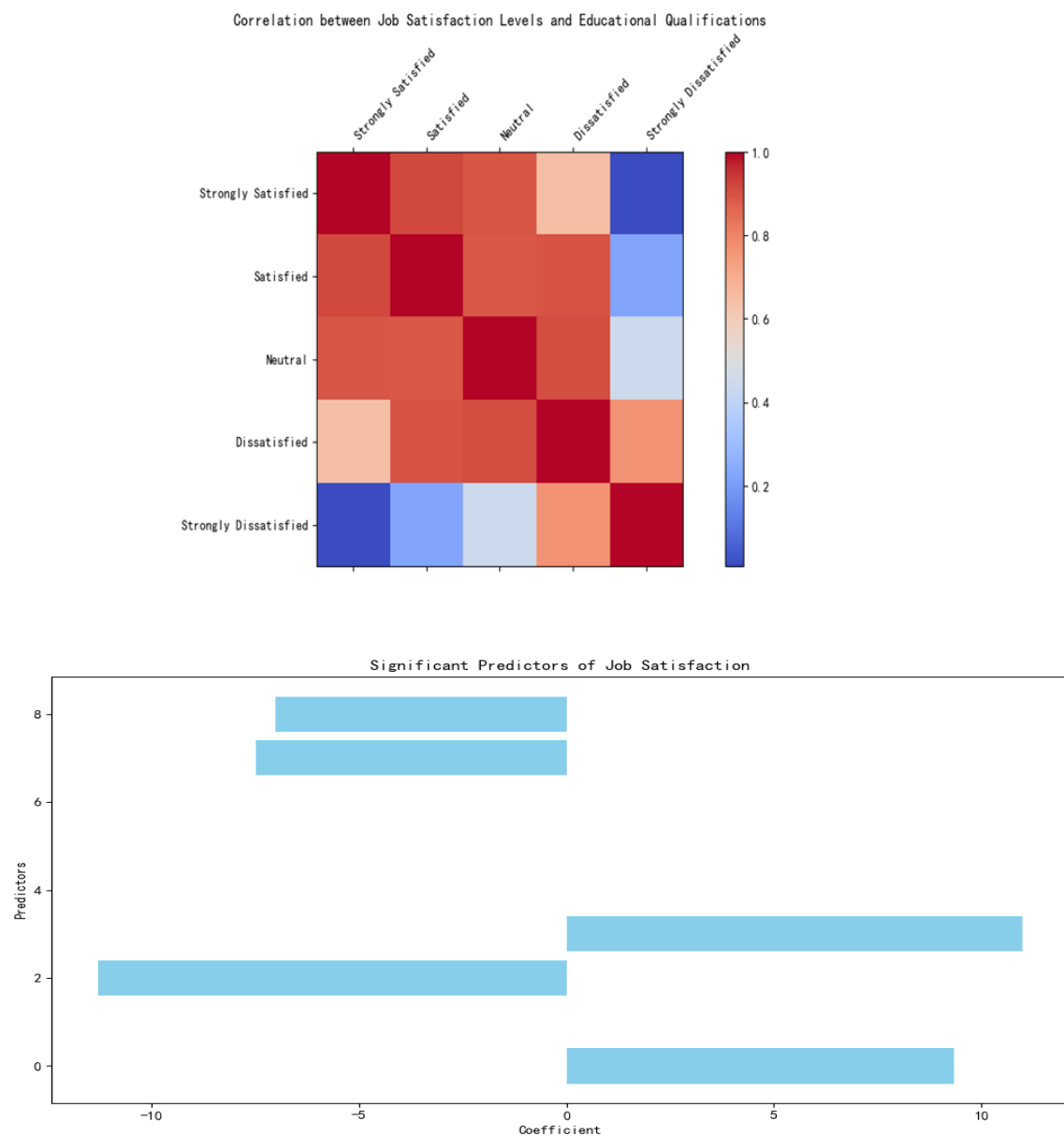


Fig. No. 12 Correlation on Between Job satisfaction level and education Qualifications

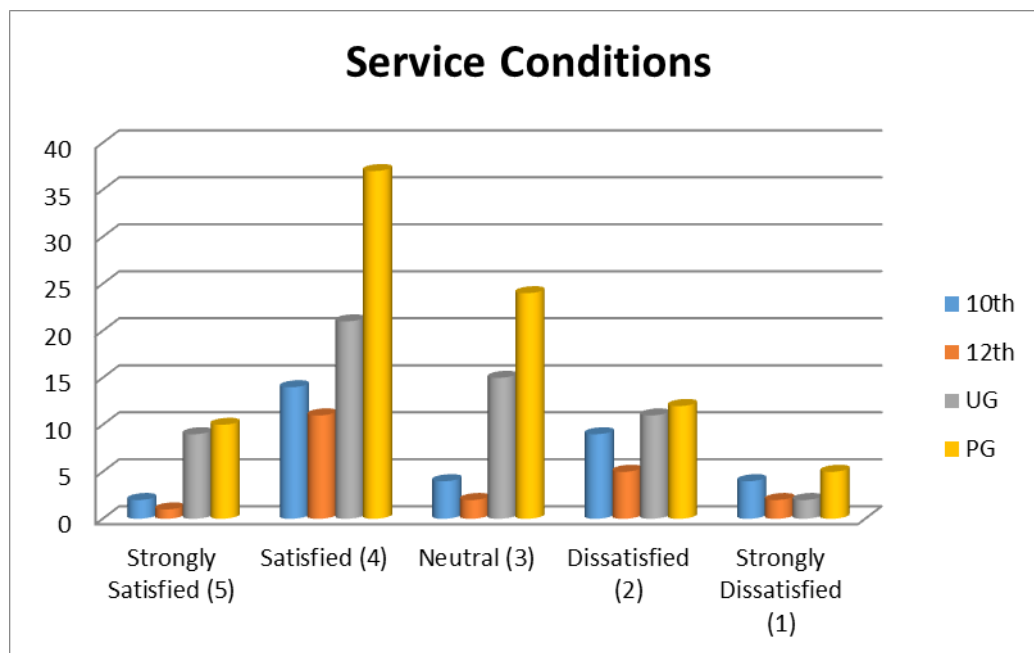
Data Interpretation:

The regression analysis result reveals that there are significant positive predictors with coefficients of roughly 11, accompanied by a standard error range from approximately 2.63 to 2.97. These predictors also have statistically significant p-values of 0.001, indicating that an increase in these predictors results in an elevated level of job satisfaction. On the other hand, strong negative predictors with coefficients approximately equal to -11.29 (with a standard error within the same range) and p-values of 0.002 indicate that a decrease in these parameters leads to a decrease in work satisfaction. The 95% confidence intervals for these variables exclude zero, providing additional confirmation of their significance in predicting job satisfaction.

In the correlation analysis summary, the heatmap graphically depicts the intensity and direction of connections among various levels of job satisfaction. There are strong correlations, with values ranging from around 0.8 to 0.9, between adjacent satisfaction levels. For example, there is a correlation between the levels "Neutral" and "Dissatisfied," as well as between "Satisfied" and "Strongly Satisfied." These correlations suggest that there is an expected order and closeness in sentiment between these levels. Regarding educational qualifications, while particular correlation values aren't supplied, the heatmap reveals varying associations with work satisfaction levels, with coefficients ranging from around 0.6 to 0.8. This implies potential correlations between greater education levels and specific satisfaction levels, needing further study for accurate interpretation.

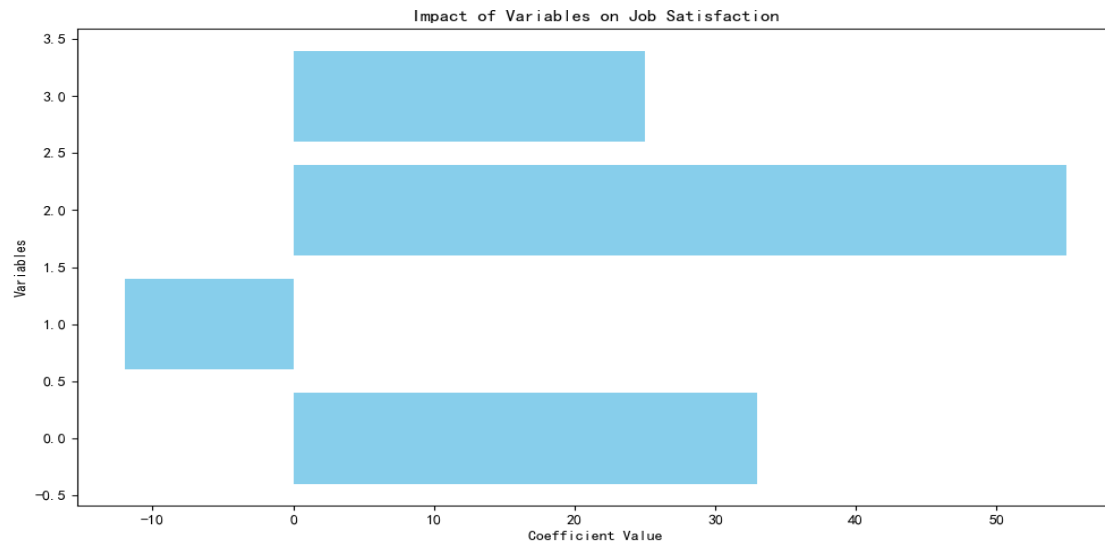
Table no. 10 Job Satisfaction regarding Service Conditions in the Educational Institutions:

Educational Qualification of Employees	Strongly Satisfied (5)	Satisfied (4)	Neutral (3)	Dissatisfied (2)	Strongly Dissatisfied (1)
10th	2	14	4	9	4
12th	1	11	2	5	2
UG	9	21	15	11	2
PG	10	37	24	12	5



(Fig no. 13 Status of Job Satisfaction regarding Service Conditions. Source: Primary data)

Figure: 13 the post-graduate employees show the maximum level of job satisfaction, followed by undergraduate and matriculates (10th). The staff with intermediate (12th) are the least satisfied compared to the other staff regarding service conditions in the educational institutions of Uttarakhand.



(Fig. No. 13 regression analysis results to highlight significant predictors Source: Table representation)

This chart shows the impact of variables on job satisfaction. The length of the bars represents the strength of the relationship between the predictors and job satisfaction.

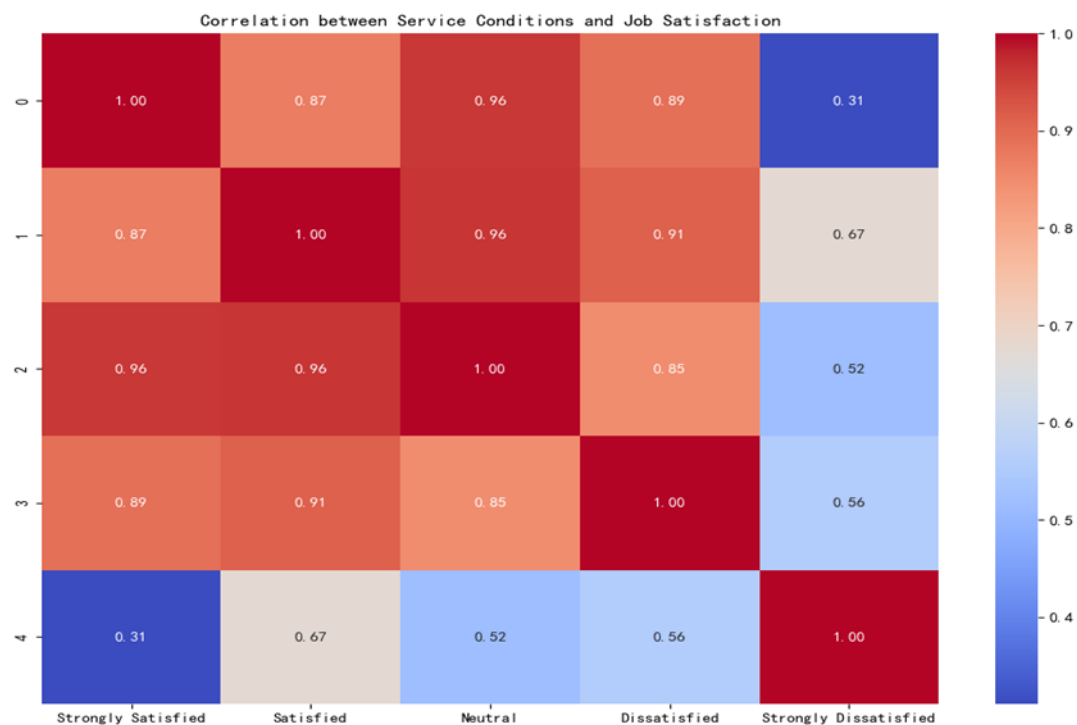


Fig no.14 Correlation between service condition and job satisfaction. (Source: Correlation analysis test)

The heatmap indicates that there is a high positive correlation between most levels of satisfaction. Notably, the correlation between Strongly Satisfied and other satisfaction levels is generally high, except for a weak correlation with Strongly Dissatisfied (0.310). Similarly, the correlation between Satisfied and Neutral is exceptionally high (0.963).

Data Interpretation:

The analysis of regression and correlation data unveils valuable insights into job satisfaction concerning service conditions in educational institutions. Regression results reveal a wide range of coefficient values, ranging from -12.0 to 55.0, indicating varied impacts of service-related factors on job satisfaction.

The mean coefficient of 25.25 suggests an overall positive influence, though the presence of inf and nan values in standard error and p-values implies potential issues with data quality or regression model robustness. Correlation analysis demonstrates generally positive associations between service conditions and job satisfaction levels, with mean correlation coefficients ranging from 0.61 for "Strongly Dissatisfied" to 0.88 for "Satisfied," emphasizing the significance of service improvements in enhancing overall job satisfaction.

Correlation Analysis:

In the research we conducted to explore the subtleties of job happiness within educational institutions, correlation analysis gave interesting insights into the links between satisfaction levels and employees' educational degrees. The results highlighted compelling correlations:- Strongly Satisfied and Satisfied: A substantial correlation of 0.872 demonstrates the harmonic synergy between heightened satisfaction and positive educational attainment. - Strongly Satisfied and Neutral: With a remarkable correlation of 0.961, this combination emphasizes the subtle dance between contentment and neutrality in educational environments. - Strongly Satisfied and Dissatisfied: Despite their apparent contradiction, a notable correlation of 0.891 indicates the deep interaction of employee attitudes. - Strongly Satisfied and Strongly Dissatisfied: While less pronounced, a correlation of 0.310 reveals a noticeable connection, offering light on the complexity of extreme contentment and discontent. Beyond mere statistics, these associations underline the potential benefits of boosting service conditions to bolster worker satisfaction levels. Given the substantial positive linkages, particularly with the "Satisfied" category, educational institutions stand to gain from emphasizing programs focused at increasing service perceptions. This could comprise regular quality assessments, requesting employee feedback, and personalized actions to address identified issues. In essence, our findings argue for a strategic focus on refining specific service-related characteristics to promote a more fulfilling work environment within educational institutions. Armed with insights from both regression and correlation studies, decision-makers may adeptly allocate resources and develop interventions oriented towards nurturing a workplace that supports pleasure and productivity alike.

Regression Analysis

The regression analysis faced significant challenges, marked by infinite standard errors and zero t-values, hindering the identification of significant predictors for job satisfaction from the provided data. Consequently, reliable conclusions regarding predictor significance are unattainable. Despite obtaining coefficient values, such as Predictor 1: Coefficient = 33, Predictor 2: Coefficient = -12, Predictor 3: Coefficient = 55, and Predictor 4: Coefficient = 25, the absence of reliable t-values or p-values underscores the necessity for further investigation to resolve issues like multi collinearity or data inconsistencies within the regression model.

Conclusion of the Study:

The purpose of this study is to explore into the details of job satisfaction levels among employees in educational institutions in Uttarakhand State, India, based on their educational degrees. Through rigorous investigation, it was determined that post-graduate employees exhibit the highest degree of job satisfaction across all six characteristics investigated. Following closely following are undergraduate employees, with matriculates (10th) trailing somewhat behind. Notably, employees with intermediate qualifications (12th) expressed the lowest degree of satisfaction compared to their colleagues. This result provides light on the complicated relationship between educational qualifications and job satisfaction levels inside educational institutions. The observed tendency implies that higher levels of education likely to correlate with heightened work satisfaction. However, further investigation is required to establish the underlying variables contributing to this discrepancy. Additionally, researching potential links between educational qualifications and certain work satisfaction criteria could provide additional insights into the mechanisms at play. Moreover, given the previously described obstacles faced during regression analysis, such as infinite standard errors and zero t-values, it is vital to resolve these concerns to ensure the reliability and validity of future analyses. Resolving these issues will permit a more robust investigation of the factors impacting work satisfaction levels among employees in educational institutions. Therefore, future research endeavours should focus on reducing these challenges and conducting detailed studies to derive actionable insights for boosting job satisfaction and general well-being among employees in educational settings.

Limitations and Future Scope of Study

This study explored job satisfaction levels among employees in educational institutions in Uttarakhand, India, based on their educational qualifications. It found that post-graduate employees showed the highest satisfaction levels, followed by undergraduates, while matriculates and intermediate-qualified employees exhibited lower satisfaction. However, this study has several limitations and provides directions for future research:

- **Limitations:**

Complex Relationship:

While the study suggests a correlation between higher education and greater job satisfaction, it does not fully identify the underlying factors that drive this relationship.

Regression Analysis Challenges:

Issues like infinite standard errors and zero t-values encountered during regression analysis limit the robustness of the statistical conclusions.

Scope of Parameters:

The study focused on six specific parameters (management, career promotions, medical benefits, working conditions, finance, and service conditions), potentially overlooking other relevant factors like work-life balance or organizational culture.

Regional Focus:

The study is limited to educational institutions in Uttarakhand, which may restrict the generalizability of the findings to other regions or sectors.

- **Future Scope:**

Explore Underlying Factors:

Future research should delve deeper into the factors that influence the relationship between education level and job satisfaction, such as personal values, job expectations, or workplace dynamics.

Enhance Statistical Rigor:

Addressing the issues encountered in regression analysis will be crucial for improving the reliability and validity of findings in subsequent studies.

Expand Parameters of Study:

Including additional parameters like work-life balance, employee engagement, and leadership style could provide a more holistic understanding of job satisfaction.

Cross-Regional Comparisons:

Future studies could compare job satisfaction trends across different regions or types of educational institutions to enhance the applicability of the findings.

Longitudinal Studies:

Conducting long-term studies could help identify how job satisfaction evolves with changing career stages and educational upgrades among employees.

Reference:

- Adekola, B., 2012.** The impact of organizational commitment on job satisfaction: A study of employees at Nigerian Universities. *International Journal of Human Resource Studies*, 2(2), p.1.
- Bhardwaj, A., Mishra, S. and Jain, T.K., 2021.** An analysis to understanding the job satisfaction of employees in banking industry. *Materials Today: Proceedings*, 37, pp.170-174.
- Bos, J.T., Donders, N.C., Bouwman-Brouwer, K.M. and Van der Gulden, J.W., 2009.** Work characteristics and determinants of job satisfaction in four age groups: university employees' point of view. *International archives of occupational and environmental health*, 82, pp.1249-1259.
- Chaubey, D.S., Mishra, N. and Dimri, R.P., 2017.** Analysis of employee relationship management and its impact on job satisfaction. *Journal of Arts, Science & Commerce*, 8(2), pp.15-25.
- Chaudhary, N.S. and Bhaskar, P., 2016.** Training and development and job satisfaction in education sector. *Training and Development*, 2(8), pp.42-45.
- Edge, K., Reynolds, R. and O'Toole, M., 2015.** Contextual complexity: The professional learning experiences of seven classroom teachers when engaged in "quality teaching". *Cogent Education*, 2(1), p.1120002.
- Giri, S.G., Kumar, S., Choudhary, A. and Rawat, M., BUILDING SUSTAINABLE COMMUNITY-BASED HOMESTAY ENTERPRISES IN UTTARAKHAND INDIA: LESSONS LEARNED AND BEST PRACTICES.**
- Giri, S.G., Kumar, S., Choudhary, A. and Rawat, M., BUILDING SUSTAINABLE COMMUNITY-BASED HOMESTAY ENTERPRISES IN UTTARAKHAND INDIA: LESSONS LEARNED AND BEST PRACTICES.**
- Joshi, S., Dani, R. and Rawal, Y.S., 2022.** A Study on Factors that Influence Job Satisfaction in the Restaurant Industry of Uttarakhand. *Research in Tourism and Hospitality Management*, p.11.
- Kaur, G. and Khemka, G., 2016.** A comparative study of job satisfaction among visually impaired and normal vision music teachers with special reference to Punjab. *Baba Farid University Nursing Journal*, 11(2), pp.71-74.
- Kumar, S. 2022.** Demystifying the asymmetric nexus between processing and working marketing challenges faced by bhotiya tribe: Empirical evidences from Garhwal region of Uttarakhand , India. *An International Peer Reviewed Research Journal* 10 (1) p.p 1-5.
- Kumar, S. and Choudhary, A.,** Analysis of Relation between Productivity and Working Efficiency on Employee Job Satisfaction in Indian Carpet Industry.
- Kumar, S., Choudhary, A., Gangil, B., & Kumar, M. 2023.** Application Of Labor Welfare Measures Among Workers In The Carpet Industry : A Study In The Light Of Government Initiative.. *BJPA* XX(1), 118-129.
- Kumar, S., Maindola, S. and Rawat, M., 2021.** Employee and work engagement: An answer to the problems of the handloom industry in India. *Parikalpana: KIIT Journal of Management*, 17(1), pp.147-159.
- Kumar, S., Raghuvanshi, A., Maindola, M.S. and Choudhary, M.A., 2021.** Challenges of women entrepreneurs in Rajasthan: an empirical study. *Industrial Engineering Journal (ISSN-0970-2555)*, 14(06), pp.5-10.
- Mira, M., Choong, Y. and Thim, C., 2019.** The effect of HRM practices and employees' job satisfaction on employee performance. *Management Science Letters*, 9(6), pp.771-786.
- Naresh, M.N.R., Subramanya, M.M. and Ramesh, M.S., 2019.** Employee Job Satisfaction in Higher Education Sector: With reference to Bengaluru City. *Think India Journal*, 22(14), pp.9627-9635.
- Razak, A., Sarpan, S. and Ramlan, R., 2018.** Influence of promotion and job satisfaction on employee performance. *Journal of Accounting, Business and Finance Research*, 3(1), pp.18-27.
- Nair, G.K., 2023.** EXPLORING THE NEXUS: WORK-LIFE QUALITY, EMPLOYEE SATISFACTION, AND PERFORMANCE IN THE HOSPITALITY SECTOR. *Journal of Business & Economic Analysis*, 6(2).

- Sabharwal, T., Saxena, S., & Mishra, A. K. 2023.** The Effects of Quality of Work- Life on Organizational Commitment and Job Satisfaction on the Employees in Private Higher Education Sector. *European Economic Letters (EEL)*, 13(3), pp1158- 1169.
- Schroder, R., 2008.** Job satisfaction of employees at a Christian university. *Journal of Research on Christian Education*, 17(2), pp.225-246.
- Terpstra, D.E. and Honoree, A.L., 2004.** Job satisfaction and pay satisfaction levels of university faculty by discipline type and by geographic region. *Education*, 124(3).
- Tietjen, M.A. and Myers, R.M., 1998.** Motivation and job satisfaction. *Management decision*, 36(4), pp.226-231.
- Tracey, J.B., Tannenbaum, S.I. and Kavanagh, M.J., 1995.** Applying trained skills on the job: The importance of the work environment. *Journal of applied psychology*, 80(2), p.239.
- Varshney and Sundaram, “Banking Theory and Practice” 1987,** S. Chand & Sons, NewDelhi, p.264-280.
- Yapa, P.M.S.P., Rathnayake, R.M., Senanayake, G. and Premakumara, P., 2014.** Effect of demographic factors on job satisfaction of non-academic staff in universities.

Crisis at One End, Opportunity on the other: Sri Lankan Crisis A Surge for Indian Tea and Textile Exports

Dr. Deepika Kumari

Assistant Professor, Department of Economics,
Shyam Lal College, University of Delhi, India.

Abstract

The Sri Lankan economy is currently in a state of distress ever seen in the country's history. Although Sri Lanka's economy has surpassed many other nations in economic and social improvements over the years, sustaining structural challenges have dimmed the nation's economic prospects. The country is currently grappling with the setbacks caused mainly due to twin deficits, the COVID-19 crisis and the war between Russia and Ukraine. Sri Lanka, a prominent player in the global tea and textile markets, is no longer able to export tea or textiles. Its massive debt default and the ongoing crisis in the economy may give new opportunities for Indian tea and textile exporters. The core objective of the current study is to explore the main factors contributing to the crisis in the Sri Lankan economy and how this condition has given India an opportunity to grow its exports. The present study used a SWOT analysis to provide critical insights into the current state of opportunities and threats, advantages and disadvantages, to get a concise picture of the Indian position. The study concluded that filling global supply gaps will be difficult for India owing to a wide range of factors such as high tariffs, rising input costs, global supply chain arrangements, and other competitors. Overall, due to these reasons and the dearth of Sri Lankan exports on the global market, India may only benefit to a limited extent.

Keywords: Current Account Deficit, Economic Crisis, India, Sri Lanka, Exports.

Introduction

In the throes of a worsening economic crisis, India's southern neighbour, Sri Lanka, is trying to stay afloat. The country's foreign exchange reserves are practically depleted, which restricts its ability to purchase imports and drives up the price of items produced domestically. Sri Lanka's ability to import food, petrol, fuel, medication and other requirements has been severely lowered as a result of escalating international debt pressure, and the island nation has sought assistance from its neighbour India to acquire necessary commodities. Garments and tea are major export items of Sri Lanka. Because of the ongoing Sri Lankan economic crisis, global demand for textiles and tea has started diverting to India. According to Samaranayaka (2022), the pandemic hit foreign exchange earnings which determined the government's ability to rebuild the economy after the crisis. This happened primarily due to a substantial reduction in foreign exchange earnings from three major sources: apparel (garment) exports, tourism and remittances. Currently, to confront the high levels of debt, lower the budgetary deficit, retain external stability, and lessen the negative effects of the crisis, urgent policy measures are required.

• Macroeconomic Performance

Ceylon, an island off India's southeast coast, formally changed its name to Sri Lanka in 1972 after gaining independence from the United Kingdom in 1948. Sri Lanka is currently engulfed in its worst financial and economic crisis since gaining independence, despite being praised for its development success story as a low-income nation. The 26-year civil war, which ended in 2009, had a profound effect on the domestic economy's structure in Sri Lanka. Despite significant infrastructure spending and a growth rate that was fairly stable from 2013 to 2019, many premature and poorly managed economic strategies contributed to the current Sri Lankan crisis. The external causes such as the COVID-19 outbreak and the war between Russia and Ukraine have made the situation even more severe (Bhowmick, 2022). Table 1 summarizes the macroeconomic performance of Sri Lanka over the five years i.e. 2017-2022.

Table 1 Sri Lanka's Macroeconomic Performance (2017-2022)

Macroeconomic Indicators (2017-2022)							2022 (P)
Indicator	Unit	2017	2018	2019	2020	2021	
Real Sector							
Growth of Real GDP	%	3.6	3.3	2.3	-3.6	3.7	1.0
GDP at Current Market Price	Rs. Billion	13328	14291	14997	15027	16809	20700
GDP Per Capita	US \$	4077	4057	3848	3695	3815	3041
External Sector							
Trade Balance	% of GDP	-11.0	-11.8	-9.5	-7.4	-9.6	-12.4
Current Account Balance	% of GDP	-2.6	-3.2	-2.2	-1.5	-4.0	-2.6
Overall Balance	US \$ mn	2068	-1103	377	-2328	-3967	-
Official Reserves (External)	US \$ mn	7959	6919	7642	5664	3139	-
Fiscal Sector							
Current Account Balance	% of GDP	-0.7	-1.2	-3.6	-7.9	-7.7	-
Primary Balance	% of GDP	0.02	0.6	-3.6	-4.6	-6.0	-
Overall Balance	% of GDP	-5.5	-5.3	-9.6	-11.1	-12.2	-10.2
Central Government Debt	% of GDP	77.9	84.2	86.9	100.6	104.6	108.2
Monetary Sector and Inflation							
Broad Money Growth	%	16.7	13.0	7.0	23.4	13.2	12.7
Private Sector Credit Growth	%	14.7	15.9	4.2	6.5	13.1	10.0
Annual Average Inflation	%	6.6	4.3	4.3	4.6	6.0	22.0

Source: Central Bank of Sri Lanka and Department of Census & Statistics, Ministry of Finance

Note: P indicates provisional

According to the central bank's most recent report, Sri Lanka's sudden economic collapse has worsened its recent macroeconomic performance. The table shows that the growth of Real GDP contracted by 3.6 per cent in 2020 due to the pandemic. The growth of Real gross domestic product (GDP) in Sri Lanka was anticipated at 1 per cent in 2022 because of the consequences of the Ukrainian war (World Bank, 2022). The GDP at the current market price stood at US dollars 16,809 billion in 2021, with a projected increase to US dollars 20,700 billion in 2022. The GDP per capita was US dollars 3,815 during 2021 which is expected to decline to US dollars 3,041 in 2022. The projected trade balance widened notably (-12.4 per cent) in 2022. The current account balance grew considerably in 2021. The overall balance recorded a deficit in 2020 as well as in 2021. Sri Lanka's external official reserves have been continuously declining since 2019. There has been an upsurge in the fiscal current account balance and primary balance since 2019. The overall fiscal deficit further widened to -12.2 per cent during 2021 from -11.1 per cent in 2020 owing to a shortfall in revenue collection. The overall fiscal deficit is expected to reach -10.2 per cent by 2022. Over the years, the debt of the central government showed a consistent upward trend and is projected to do so in 2022 with a value of 108.2 per cent. The consistent increase in the central government's debt, spurred by poor fiscal sector performance, has remained a major fiscal challenge. The broad money growth accelerated to 23.4 per cent in 2020 from 7 per cent in 2019 and predicted 12.7 per cent in 2022. The growth of private sector credit remained elevated post-2019 and is expected to reach 10 per cent by 2022. Inflation is expected to hit an all-time high double-digit level i.e. 22 per cent by 2022.

Although the pandemic has severely affected Sri Lanka's economy its recent weaker macroeconomic performance is a reflection of many other factors not just the COVID-19 pandemic crisis.

The Underlying Causes of Economic Crisis in Sri Lanka

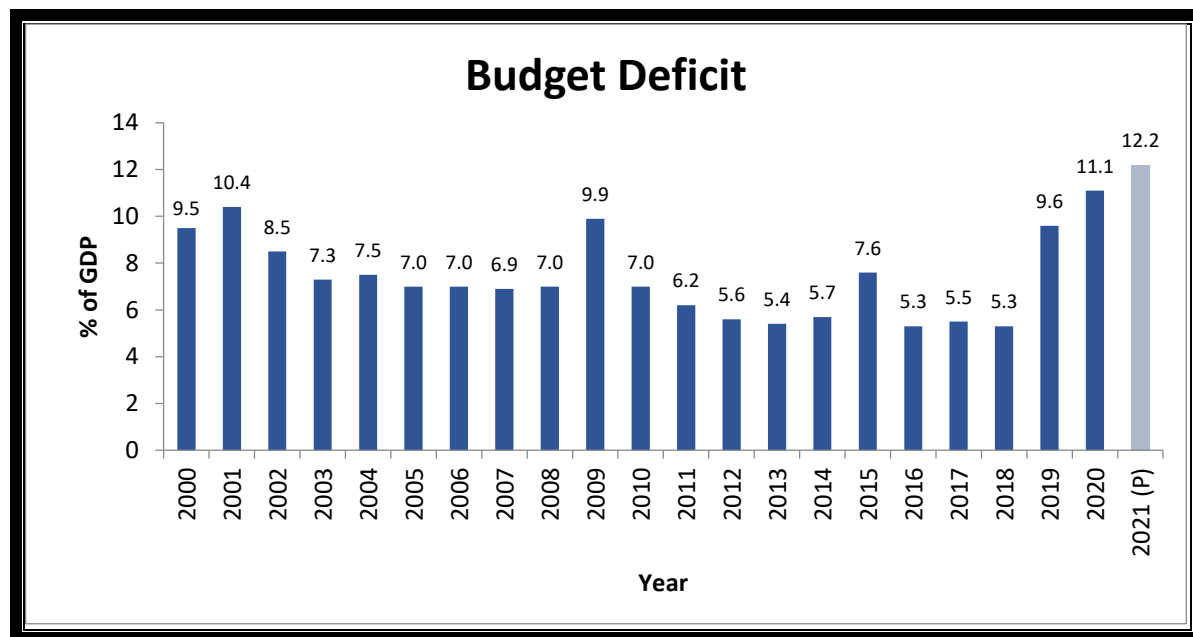
Critics argue that the economic mismanagement of governments, which led to and retained a twin deficit—a shortfall in the budget as well as a deficit in the current account—is what brought on the crisis, dreadful in the

past several decades. According to a working paper from the Asian Development Bank published in 2019, Sri Lanka has a "typical twin deficits economy." "Twin deficits" signify an insufficient level of tradable goods and services produced by a nation paired with an excess of national spending over national income. (Weerakoon et al., 2019). The twin deficit challenge made Sri Lanka heavily reliant on foreign debt.

- **Budget Deficit**

Due to the economy's downturn, high relief spending, and post-presidential election 2019 tax cuts, Sri Lanka's budget deficit went up from 9.6 per cent of GDP in 2019 to 11.1 per cent of GDP in 2020. The deficit is projected to reach 12.2 per cent of GDP in 2021 instead of the intended lowered level of 8.8 per cent (refer to Figure 1).

Figure 1 Sri Lanka's Budget Deficit for the period 2000-2021(P)



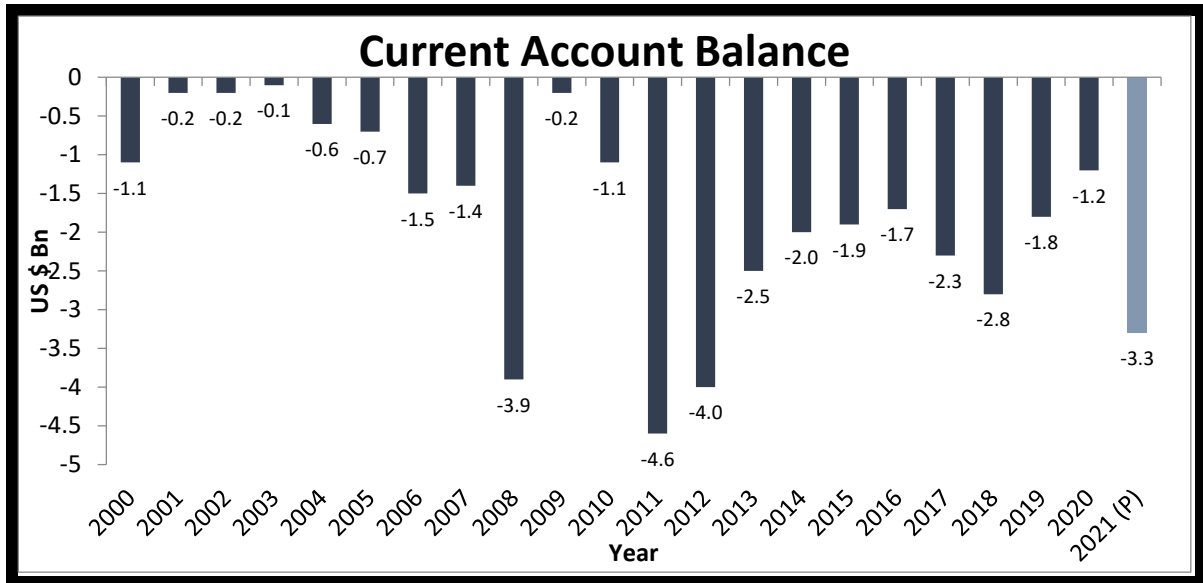
Source: Ministry of Finance

Note: P refers to provisional

- **Current Account Balance**

The deficit or current account balance is likely to hit an eight-year high of US dollars 3.3 billion during 2021 as compared with a balance of previous years. Figure 7 shows that the deficit reached an all-time high of US dollars 4.6 billion in 2011 and a record low of US dollars 0.1 billion in 2003. The current account balance is expected to widen notably in 2021 (refer to figure 2).

Figure 2 Current Account Balance of Sri Lanka for the period 2000-2021 (P)



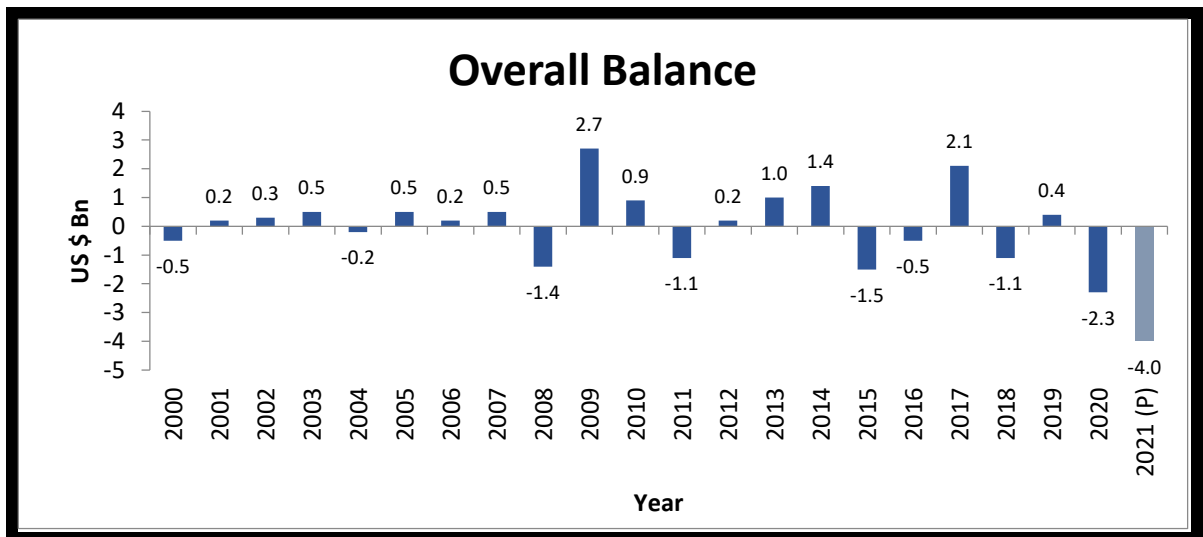
Source: Central Bank of Sri Lanka

Note: P refers to provisional

• Overall Balance

Sri Lanka's capital account and current account balances have generally gone in opposite directions, with the former in surplus and the latter in persistent deficit. Hence, the current account balance has substantially led to overall deficits. The overall balance of Sri Lanka's balance of payments is expected to record a considerable imbalance of around US dollars 4.0 billion during 2021 highest in the past 20 years (refer to figure 3).

Figure 3 Balance of Payments of Sri Lanka for the period 2000-2021 (P)



Source: Central Bank of Sri Lanka

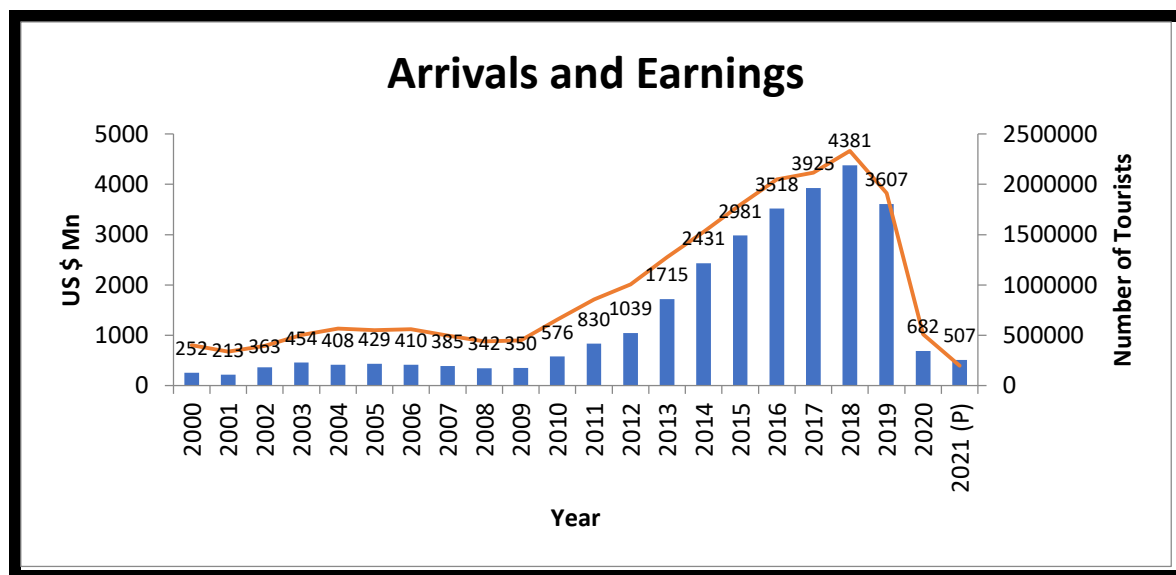
Note: Prefers to provisional

The primary factor triggering the crisis is a dearth of foreign exchange reserves. In the latter half of February 2022, it had decreased by 70 per cent in just two years less than US dollars 2 billion, hardly enough to cover imports for two months. As of this year, the country has committed to paying about US dollars 7 billion in foreign debt. There are many causes of the FOREX crisis. Due to the pandemic's devastating effects on Sri Lanka's valuable tourism industry and the remittances sent home by foreign employees, the country's largest source of funds fell 22.7 per cent to US dollars 5,491 million in 2021.

- **Tourist Arrivals and Earnings**

Following the 2019 Easter Sunday suicide attacks, tourism, the third-largest source of foreign exchange came to an abrupt end. The number of visitors dropped as much as 70 per cent. Over 250 people, including at least 45 foreigners, lost their lives in the Easter time explosions in Colombo's commercial area. Christians in three church buildings and guests at three luxurious hotels were targeted. Several businesses stayed closed for many days after the attack. The arrivals of tourists in Sri Lanka during 2020 totalled 507,704 indicating a 73.5 per cent decrease after 2019 (refer to figure 4). The unprecedented healthcare and human crisis triggered by the COVID-19 pandemic caused severe damage to this sector, almost setting it to a standstill. Bhowmick (2022) argued that the war between Russia and Ukraine has further crippled the Sri Lankan tourism sector. In 2022, nearly 30 per cent of visitors were from Russia, Ukraine, Poland, and Belarus comprising about 20,000 Russian and Ukrainian tourists who travelled to Sri Lanka. The conflict has posed a threat to halt this flow.

Figure 4 Tourist Arrivals and Earnings in Sri Lanka from 2000-2021 (P)

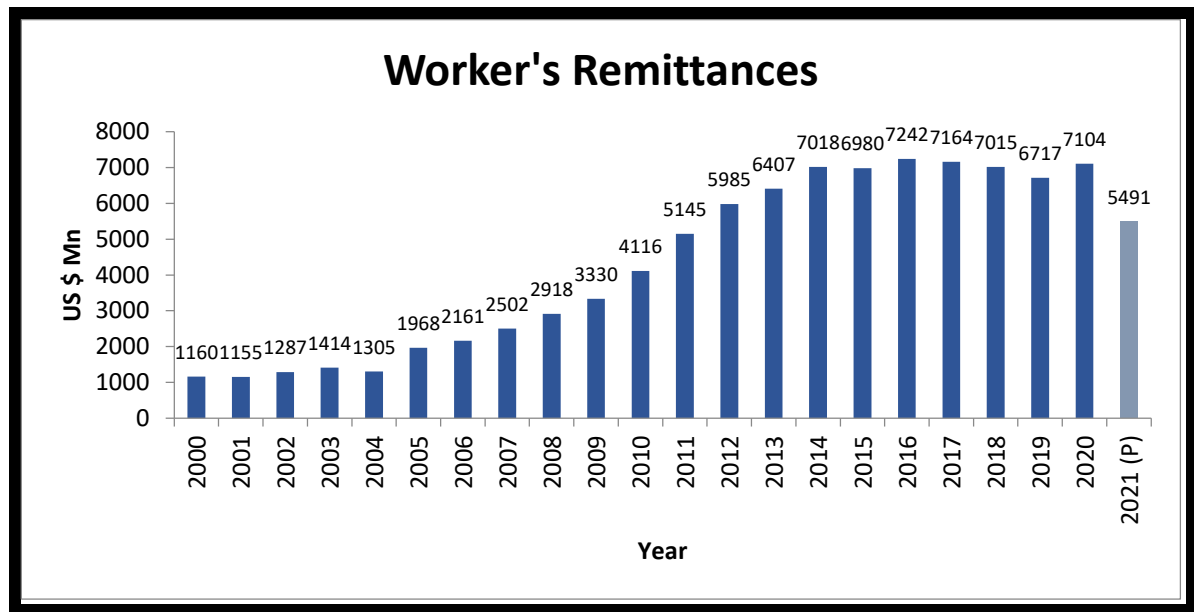


Source: Sri Lanka Tourist Development Authority (SLTDA) and Central Bank of Sri Lanka

- **Worker's Remittances**

Over the past 20 years, on average, workers' remittances have covered 80 per cent of the annual trade deficit, making them a significant source of foreign exchange earnings. (Central Bank of Sri Lanka, 2022). Due to the pandemic, workers' remittances which were one of the major sources of foreign reserves slumped by 22.7 per cent to US dollars 5,491 million in 2021 from US dollars 7,104 million in 2020 (refer to figure 5). Moreover, the remittances were not used productively by the government.

Figure 5 Worker's Remittances in Sri Lanka from 2000-2021 (P)



Source: Central Bank of Sri Lanka

- **Tax Cuts**

In fulfilment of the promise made before the elections, the government approved large tax cuts towards the end of 2019 and in early 2020, before the pandemic (refer to Table 2), which ripped out parts of Sri Lanka's economy. As a result between the years 2020 and 2022, there was a huge fall in several taxpayers creating a severe challenge to the Sri Lankan economy, which was already beleaguered by widespread tax evasion and fraud.

Table 2 Taxes Abolished in Sri Lanka during FY 2019-20

Tax Category	Amendment
Value Added Tax (VAT)	Knocked down to 8 per cent from 15 per cent.
Nation Building Tax (NBT)	The previous 2 per cent of NBT was eliminated. NBT was pooled with the Ports and Airport Development Levy with a relevant ratio of 10 per cent
Economic Service Charge	Abolished
Debit Tax on Banking and Financial Institutions	Abolished
Capital Gains Tax on the Share Market	Abolished
VAT on Sovereign Property	Abolished
Pay As You Earn (PAYE) Tax	Abolished
Withholding Tax on Interest Income, other types	Abolished
Credit Service Tax	Abolished
Tax on Telecommunication Tariffs	Decreased by 25 per cent

Source: Colombo Page and Bhowmick (2022)

Sudden Transition to Organic Farming

The Sri Lankan government outlined a ten-year vision for the country's transition to fully organic farming. To lessen the health risks posed by using chemical fertilizers and pesticides in agriculture and to support environmentally friendly sustainable agricultural systems, the government declared to ban the import of agrochemicals. Although switching to organic farming seemed to be a step towards environmental sustainability, the rapid switch was like a ticking bomb that was about to burst off (Bhowmick, 2022). The

government's decision was however later reversed; it adversely affected the Sri Lankan agricultural sector, resulting in a decrease in output and higher prices (The Indian Express, 2022; Vanamali, K.V. 2022).

- **Russia- Ukraine War**

Many factors, ranging from debt to inflation, have contributed to the ongoing crisis. Food and energy prices have increased globally as a result of the Russia-Ukraine war, making imports more expensive. Russia and Ukraine are major importers of Sri Lankan black tea and exporters of wheat respectively. Nearly 18 per cent of Sri Lankan fermented black tea exports are received by Russia and Ukraine. Similarly, these two nations account for 45 per cent of wheat imports. Besides, more than half of Sri Lanka's imports of soybeans, sunflower oil, sunflower seeds, and peas come from Ukraine. In addition, both countries are significant suppliers of asbestos, iron and steel, semi-finished products, copper (cathodes), and potassium chloride for fertilizer. (Wijesinghe, 2022). Tourism revenue is another issue. In 2022, almost 30 per cent of visitors came from Belarus, Poland, Russia, and Ukraine, and the war threatened to stop that flow (The Times of India, 2022b).

- **Objective and Need of the Study**

The collapse of Sri Lanka drew immediate attention on a global scale. India can take the opportunity to explore new markets and boost its exports by learning from the mistakes made by its neighbours. This particular issue has not yet been the subject of a detailed evaluation. A move has been made in this direction as a result.

The core objective of the present study is to explore the main factors contributing to Sri Lanka's economic problem and how this condition has given India an opportunity to increase its exports. SWOT analysis has been used to discover India's strengths, weaknesses, opportunities and threats. The study has been segregated into six sections. In section 2 historic perspective has been given. Section 3 deals with the main exports of Sri Lanka and opportunities for India. SWOT analysis has been performed in section 4. Section 5 gives the policy recommendations while Section 6 brings the discussion to a conclusion.

- **Historic Perspective**

A brief examination of the historical perspective, including the causes and consequences of the crisis in the Sri Lankan economy, has been conducted. Yousuf (2021) examined the impact of the Sri Lankan economic crisis on India. The study emphasizes the cause of the crisis. The three main factors causing the crisis were a fall in exports of major commodities viz. tea, rubber and garments due to decreased production or output, a decline in worker remittances, and a drop in tourism. The fall in output was caused by the sudden move to go organic. The terror attacks and the COVID-19 pandemic weakened the tourist sector. The study sheds insight on the economic ties between India and Sri Lanka in light of Chinese intervention. The study suggests India remains vigilant and offers related policy implications. The impact of the 2019 tax cuts on the domestic economy, subsequent balance of payment (BOP) crises, a series of mishandled IMF bailouts, the abrupt disastrous switch to organic farming, the tourism sector's decline following the 2019 Easter Sunday explosions, and rapidly growing external debt are the six key economic issues that Bhowmick (2022) identified as having contributed to the Sri Lankan crisis. The study outlined some rational points from the Sri Lankan instance which necessitate critical analysis to provide macroeconomic implications to South Asian neighbours. Aryal (2022) attempted to investigate the crisis in the Sri Lankan economy from the standpoint of a geopolitical war between China and India. It also emphasized disseminating details regarding India's possibilities in Sri Lanka. The study found financial mismanagement, corruption, lack of transparency, foreign debt, huge tax cuts, the COVID-19 crisis and the war between Russia and Ukraine were the reasons behind the severe economic crisis in the country. The study noted that because of its geostrategic location, Sri Lanka is of great interest to both China and India. The study further suggested that India now has a chance to establish itself as a reliable regional leader amid the Sri Lankan economic crisis. Yadav and Rai (2022) evaluated the economic situation in Sri Lanka. The study identified current account balances, tax concessions, and government borrowings as red flags for the Sri Lankan crisis. Apart from that failed policy of organic drive, the COVID-19 pandemic, loss of tourism and investor confidence, and currency depreciation due to poor governance contributed to the collapse of the Sri Lankan economy. The study noted that the Russia- Ukraine war has also contributed to this woe. The study concluded that the impact of the crisis can be seen in its neighbouring South Asian counterparts Pakistan and Nepal. Sultana (2022) examined Sri Lanka's current condition and the policy steps taken to address it. The study observed the decline in foreign exchange reserves as a result of a decline in the exchange-earning sectors of tourism, remittances, and exports as the cause of the crisis. To address the issue of settling imports and debt, the government has reached out to bilateral partners for credit, loan, and currency swap facilities. Additionally, by not defaulting on debt servicing special emphasis is also being placed on restoring investor trust while dealing with the economic crisis. Sharma (2022) examined the ongoing political turmoil and economic crises in the Sri Lankan economy. The study focused on the underlying causes, domestic factors, and effects of crises on the

economy. The study showed how China has an impact on the economy of Sri Lanka. The report discusses the response to the Sri Lankan crisis on a global platform. The study looked at the actions the government is taking to help the economy out through the present financial crisis.

How India can seize this opportunity has not been primarily focused on the research available. Hence, the present study attempts to accomplish this.

- **Main Exports of Sri Lanka and Opportunities for India**

- **India- Sri Lanka Ties**

Over 2,500 years, exchanges involving shared religious, cultural, and linguistic practices served as the foundation for Sri Lanka and India's historical relations. In the 1800s, the British colonised both Sri Lanka and India, which attained independence in 1947 and 1948, respectively. Before the advent of colonialism, Sri Lanka and India maintained close commercial connections. Sri Lanka's major trading partner and primary source of foreign direct investment (FDI) is India. Sri Lanka, however, has a smaller impact as an economic partner because of its relatively small market size. Another facet of economic linkages between the two countries is an enduring development relationship that involves many sectors which mainly comprises infrastructure, transportation, connectivity, housing, livelihood and rehabilitation, health, education, and industrial growth. Both nations are members of inter-governmental organizations namely SAARC and BIMSTEC, which focus on strengthening regional cooperation and integration in the South Asian region (Huettemann, Pabasara and Panwar, 2020).

- **Sri Lanka's Main Exports**

Tea, coffee, rubber, and spices were among the top export-oriented crops that dominated Sri Lanka's agricultural industry after the island nation got its independence from the British in 1948. According to the Central Bank of Sri Lanka's annual report, tea, rubber, and coconut were the three main plantation crops that accounted for around 90 per cent of the country's exports. The export of these crops brought in foreign exchange that contributed significantly to the country's GDP. The essential food items were imported through this money. Over time, the nation started exporting garments and generating foreign exchange from remittances and tourism. This implies a fall in exports would be a disruptive economic event and put pressure on foreign exchange reserves. Therefore as a direct consequence, Sri Lanka frequently experienced balance of payments crises (Ramakumar, 2022). Due to the crisis, Sri Lankan exports have suffered significantly, providing an opportunity for other countries. Table 3 indicates that Sri Lanka mostly exports textiles & garments and tea.

Table 3 Top 10 export commodities of Sri Lanka (2019-21)

(Value in US \$ million)				
HS Code	4-digit heading of harmonized system 2017	2019	2020	2021
	All commodities	11974.2	10706.9	13331.2
0902	Tea, whether or not flavoured.	1322.6	1329.5	1391.6
6212	Brassieres, girdles, corsets, braces, suspenders, garters.	645.8	501.4	690.2
6108	Women's or girls' slips, petticoats, briefs, panties, knitted or crocheted	651.8	496.3	675.7
6104	Women's or girls' suits, ensembles, jackets, blazers, dresses, skirts	519.8	430.1	557.2
6204	Women's or girls' suits, ensembles, jackets, blazers, dresses, skirts	564.1	434.3	491.5
6109	T-shirts, singlets and other vests knitted or crocheted.	507.2	404.3	541.6
4012	Retreaded or used pneumatic tyres of rubber	338.8	297.3	438.9
6203	Men's or boys' suits, ensembles, jackets, blazers, and trousers.	377.1	295.5	393.1
6116	Gloves, mittens and mitts knitted or crocheted	329.6	321.4	404.8
4015	Articles of apparel and clothing accessories	207.3	267.8	391.6

Source: International Trade Statistical Yearbook

Sri Lanka is a well-known exporter of tea and related products. The country's recent internal issues have had a significant impact on tea exports, prompting countries such as India to try to fill the gaps in international markets. Almost 98 per cent of Sri Lanka's annual tea production, which amounts to approximately 300 million kg, is exported. The vast majority of tea items are traditional. Traditional techniques like picking, twirling, oxidation/fermentation, and drying are used to make loose-leaf tea (Kannan, 2022). Sri Lanka continues to be one of the top five tea-producing countries in the world, as per the Sri Lankan Export Development Board. Even though China, India and Kenya are major tea exporters by volume, Sri Lanka stands as the world's third-biggest tea exporter of Ceylon tea worth US dollars 1.4 billion. Excellent flavour, variety, and high quality are hallmarks of Ceylon tea. Black tea predominates the country's tea exports, and the country is still working to fully exploit expanding global market demand for leafy green tea, various organic tea variants, and herbal infusions of fruit (EDB Sri Lanka, 2022).

Sri Lanka's apparel industry accounts for around half of its exports, placing the country among the world's top producers of clothes. The apparel industry is estimated to account for six per cent of the country's GDP, which supports 7,00,000 people indirectly and 3,50,000 people directly. The economic downturn has also harmed Sri Lanka's reputation as a reliable partner and exporter in the apparel industry. Numerous small firms have been forced to close due to power and fuel shortages, which has also raised the cost of garment and apparel production. India is once more seen by nations wary of importing from Sri Lanka as a reliable alternative (Kannan, 2022).

Table 4 Sri Lanka's Export Direction 2017-2021 (P)

Direction of Exports										
	Value (US \$ million)					Share (percentage)				
	2017	2018	2019	2020	2021 (P)	2017	2018	2019	2020	2021 (P)
Countries										
USA	2909	3085	3141	2500	3108	25.6	25.9	26.3	24.9	24.9
UK	1036	980	998	908	938	9.1	8.2	8.4	9.0	7.5
India	691	777	768	606	829	6.1	6.5	6.4	6.0	6.6
Germany	540	614	648	570	758	4.8	5.2	5.4	5.7	6.1
Italy	524	572	528	455	581	4.6	4.8	4.4	4.5	4.6
Netherlands	221	258	301	290	426	1.9	2.2	2.5	2.9	3.4
Belgium-Luxembourg	347	361	357	297	343	3.1	3.0	3.0	3.0	2.7
Canada	210	211	241	213	316	1.8	1.8	2.0	2.1	2.5
UAE	275	290	276	190	287	2.4	2.4	2.3	1.9	2.3
China	247	239	240	225	277	2.2	2.0	2.0	2.2	2.2

Source: Central Bank of Sri Lanka

The major single market for Sri Lankan exports is the United States. The Sri Lankan exports to the USA stood at US dollars 3108 million in 2021. The main buyers of Sri Lanka's exports include the USA, UK, India and Germany (see table 4).

• Opportunity for India

The approximately 170-year-old Indian tea industry contributes significantly to the nation's economy. India is one of the top five exporters of tea and the second-largest producer in the world and accounts for roughly 10 per cent of total tea exports. Traditionally, India and Sri Lanka are competitors in the global market. Black tea is India's predominant export, accounting for 96 per cent of total exports, Indian tea exports consist of black, green, regular, masala, herbal and lemon tea. Among these, black, regular, and green tea account for approximately 80 per cent, 16 per cent, and 3.5 per cent of total tea shipped from India, respectively. In India, tea plantations are mostly found in rural, hilly regions of the northeastern and Southern States. Assam, West Bengal, Kerala, and Tamil Nadu are the primary growing locations for tea in the nation. In addition to green tea, India also produces orthodox and CTC (crush, tear, and curl) teas, unlike the majority of other nations that produce and export tea (IACC, 2017; Tanwer, 2022). India is ready to address supply shortages following Sri Lanka's unexpected halt of tea supplies to the global tea market. The world's largest exporter of tea, Sri Lanka, has been coping with a dramatic fall in tea production as a result of daily power outages lasting 12-14 hours.

Exporters of Indian tea are in a great position to gain market share in nations that import traditional tea. India could expand its presence in new markets like Turkey, Iraq, the United States, China, and Canada as well as Iran (Bhardwaj, 2022).

India is one of the world's leading garment-producing countries. There is a heritage of excellent craftsmanship throughout the whole value chain of Indian textile and apparel products, from fibre, yarn, and fabric to premium garments. India is well known for its cotton, silk, and denim, and its apparel has been successful in establishing fashion hubs around the world. India is one of the largest producers and consumers of cotton, occupying 12.35 million hectares, or 37 per cent of the world's total area, under the production of cotton. A significant percentage of the highly diverse Indian textile and apparel business is made up of traditional handloom, handicraft, wool, and silk products, as well as the organized textile industry. The United States was the leading export destination for the apparel and textile sectors in 2021-22, accounting for 27 per cent of total exports, up from 24 per cent in 2019-20 (IBEF, 2022). In India, the domestic apparel and textile sector accounts for 7 per cent of the industrial production in terms of value and 2 per cent of the country's Gross Domestic Product (GDP). Textile, garment, and handicraft exports accounted for 11.4 per cent of total Indian exports in 2020-21. India accounts for 4 per cent of the global apparel and textiles trade. India is the world's sixth-largest exporter of textiles and apparel. India is a major producer of cotton and jute in the world. India is also the world's second-largest silk manufacturer, contributing more than 95 per cent of all hand-woven fabric. The Indian technical textiles segment is valued at US dollars 16 billion, accounting for approximately 6 per cent of the international market. India's textile and apparel sector is the country's second-largest employer, employing 45 million people directly and another 100 million indirectly (Tyagi, 2022).

• SWOT Analysis

India's position can be evaluated using a SWOT analysis which identifies strengths, weaknesses, opportunities, and threats. An industry's strengths are what make it stand out from the competitors and what it excels in. Weakness prevents the industry from operating at its best. Opportunities are positive external elements that might give a sector or industry a competitive edge. Threats are anything that could hurt a sector or industry of the economy. In simple terms, a SWOT analysis examines both internal and external factors affecting the sector. Consequently, some of these elements will be under control, while others won't. SWOT analysis is represented as a square separated into four quadrants, each of which is devoted to a distinct facet of SWOT. This visual illustration shows a concise picture of the industry's position. All of the components that fall under a specific issue provide critical insights into the balance of opportunities and risks, benefits and drawbacks, and so on.

Table 5 SWOT Analysis

INTERNAL FACTORS	
STRENGTHS (+)	WEAKNESSES (-)
<u>Textile & Apparel</u> 6th largest exporter of textile and apparel - accounts for 5 per cent of the world's trade - Supplies 95 per cent of the total world's hand-woven fabric, Exports to more than 100 countries across the globe - Highly diversified & maintained a positive trade balance over the past ten years <u>Tea</u> 2nd biggest producer & among the top five exporters - The world's best and finest teas are Assam, Darjeeling, and Nilgiri tea - McLeod Russel India, CCL, Tata Tea and Neelamalai Agro had significant gains	<u>Textile & Apparel</u> - High tariff - The paucity of large manufacturing capacities <u>Tea</u> - Indian tea varieties do not fit into the vacuum of Sri Lankan high-grown (high altitude) varieties. - India primarily sells black tea, accounting for around 96 per cent of total tea exports, whereas Sri Lanka primarily exports orthodox tea

EXTERNAL FACTORS	
OPPORTUNITIES (+)	THREATS (-)
<u>Textile & Apparel</u> • 7 mega textile parks have been planned • a massive raw material and manufacturing base • GOI has launched various initiatives to promote this sector • Duties and taxes on exported goods are waived • Major International brands have been reportedly looking toward India <u>Tea</u> • The Tea Board of India launched a campaign to promote packaged tea of Indian origin • The Tea Board is providing subsidies to domestic exporters to participate in International Fairs and Exhibitions • Tea exporters have started to concentrate on venturing into new regions and markets to fill the gap arising due to the Sri Lankan Crisis.	<u>Textile & Apparel</u> • Less competitive in comparison to countries such as Vietnam and Bangladesh due to high import and export duty • Multiple trade agreements are leading to complexities of compliance and adding to the trade costs • High cost of raw materials such as cotton and yarn <u>Tea</u> • Higher cost to produce orthodox tea and the output processes might cause crop losses • China, Vietnam and Indonesia are close competitors as they produce a lot of tea products.

Strengths and Opportunities

Chart Area

India is the sixth-largest exporter of apparel and textiles worldwide. India manufactures high-quality apparel, accounting for 5 per cent of the world's textile and apparel trade. India exports handlooms and handicrafts, along with apparel and textiles, to more than 100 nations worldwide. It produces nearly 95 per cent of the world's hand-woven fabric. The organized textile industry in India as well as its traditional handloom, handicrafts, wool, and silk items, are just a few of the many segments that make up the diversified textile and apparel sector in India. Over the previous ten years, India has generally kept a positive trade balance in this area. By 2025–2026, 7 mega textile parks are expected to expand India's textile and apparel sector to dollars 190 billion. India has a sizable manufacturing and raw material base. The Advance Authorization (AA) and Amended Technology Upgradation Fund Scheme (ATUFS) programmes are aimed at boosting and expanding the nation's textile and apparel manufacturing. The Government of India has introduced several additional initiatives over the past few years to support apparel and the textile sector, including the implementation of the Textile Cluster Development Scheme (TCDS) from 2021–2022 to 2025–2026, the creation of seven PM Mega Integrated Textile Region and Apparel (PM MITRA) parks in greenfield and brownfield locations, and the production linked incentive (PLI) scheme for technical textiles. The government has also approved extending the RoSCTL programme (system for a rebate of central and state taxes and levies on the export of garments and made-ups) through March 2024 to improve the export competitiveness of Indian apparel and manufactured goods. By conducting research and contributing ideas on the Free Trade Area (FTA), Foreign Trade Policy (FTP), and bilateral agreements, the AEPC (Apparel Export Promotion Council) is promoting the apparel sector. Major international retailers like Mango, Zara, and Hennes & Mauritz (H&M) have chosen to concentrate on India because other Asian exporters like Bangladesh, Vietnam, and Cambodia are unable to fill the gap. The UK, EU, and even Latin American countries, where Indian textiles had little to no presence, have started to place orders with Indian apparel exporters in Tirupur District, the centre of the textile industry in Tamil Nadu, indicating that the Indian textile industry is also poised to benefit from the crisis.

India is the second-largest tea producer in the world. It is among the best five producers of tea for export worldwide. One of the best teas in the world comes from Assam, Darjeeling, and Nilgiri. In recent months, shares of McLeod Russel India, CCL, Tata Tea, and Neelamalai Agro all saw considerable rises. Indian tea is among the best due to strong region-specific indicators, significant investment in tea manufacturing plants, ongoing innovation, increasing product mix, and smart market expansions. The Promotion for Packaged Tea of Indian Origin programme launched by the Tea Board of India offers support with promotional campaigns, including cost reimbursement of up to 25 per cent, exhibition in global department outlets, creation of product literature and websites, and a 25 per cent cost reimbursement for inspection fees. To take part in global trade fairs and exhibitions, the Tea Board also offers subsidies to local exporters. To fill the void left by the Sri Lankan issue, Indian tea exporters may focus on expanding into other markets such as Turkey, Iraq, the US, China, and Canada.

- **Weaknesses and Threats**

It is very challenging for Indian exporters to compete with such nations that have lower tariffs than India. The absence of import taxes on cotton from Australia, Brazil, and South Africa in nations like Bangladesh and Vietnam in contrast to India has resulted in high input costs and rendered them uncompetitive. As a result, our importers urged the government to eliminate the import tax. In some markets, such as the European Union and the UK, Vietnam, Bangladesh, Sri Lanka, and Pakistan are gaining an advantage, while Indian exporters are suffering. The high cotton and yarn prices are a major concern for the Indian textile industry. Multiple trade agreements are also leading to complexities of compliance and adding to the trade costs which may discourage industry from taking advantage of the free trade agreements.

Assam and Bengal tea varieties do not match Sri Lankan high-cultivated (high altitude) varieties. Moreover, India mostly exports black tea, accounting for around 96 per cent of total tea exports while Sri Lanka largely exports orthodox tea which tends to be harvested and processed by hand. The cost of producing orthodox tea is 20 times higher, and the output process may result in crop losses. Local producers are hesitant to invest in upgrading their production processes because they fear that the window for selling more traditional tea will be closed as soon as the crisis is over. Apart from that, China, Vietnam and Indonesia are close competitors as they produce a lot of tea products.

- **Can India fill the gap?**

The United Kingdom, the European Union, and even Latin American countries, where Indian textiles were largely absent are starting to place orders with Indian apparel exporters, signalling that the Indian textile sector is also prepared to benefit from the crisis. Tripur, Tamil Nadu's textile hub known for high quality and low cost, is experiencing an increase in overseas orders as export demand is shifted to India as a result of the ongoing Sri Lankan crisis. India has also taken steps to increase its apparel exports to capture a larger proportion of the global market, which is largely occupied by Man-Made Fibres (MMFs). Since India manufactures high-quality apparel and has a large manufacturing capacity, increasing exports may be easier.

With an annual tea production of 900 million kg, India is well-positioned to capitalize on the opportunity and fill the gap. Orthodox teas from both India and Sri Lanka are very popular in Russia, and India relies largely on the CIS for tea exports. The scarcity of Sri Lankan tea may increase the demand for Indian orthodox tea. As predicted by the commerce ministry, Iran and Saudi Arabia are more receptive to Indian Orthodox tea after the Sri Lankan crisis. There has been a surge in Indian tea exports. However, India produces approximately 100–120 million kilogrammes of Orthodox tea, whereas Sri Lanka produces approximately 300 million kilogrammes of tea, 90 per cent of which is Orthodox. Therefore, manufacturing of Indian Orthodox tea will contribute to partially filling the gap. Additionally, the Sri Lankan problem does not imply that Indian exporters will considerably gain because the island nation's produce has its unique nature and taste. (Business Today, 2022)

- **Policy Recommendations**

India should make use of this opportunity and must come up with an action plan to increase exports. The following must be done by India if it wants to take advantage of export opportunities in developed markets.

First, tariff rates for intermediate inputs should be lowered to either zero or be negligible level as high cotton and yarn prices are making textile exports uncompetitive. Second, growth, promotion and research in the tea industry must be optimized to encourage tea exports. The proposed Tea Promotion and Development Act must be implemented as soon as possible. Third, to reap the benefits India must improve its trade integration with global supply chains to join larger trade agreements and regions. Fourth, India must continue to focus on its specialization patterns toward labour-intensive processes and product lines. Given our comparative advantage in labour-intensive activities and the need to employ a growing labour force, the textile industry holds the greatest potential for export growth and job creation. Fifth, a sustained and constructive foreign direct investment (FDI) policy is essential as foreign capital and technology are essential drivers of global supply chains. Sixth, if fundamental problems like power availability and logistical impediments continue to rear their heads, exports may suffer. Power, transportation, communication, and other services need to be enhanced for an uninterrupted export supply. Lastly, without government assistance, it would be challenging for the industries to invest in improving their production method and output. To reap benefits, the government should provide exporters substantial support.

- **Conclusion**

Concerningly, Sri Lanka's current account deficit demonstrates the country's heavy reliance on the external sector, which frequently causes the economy to become insolvent due to the accumulation of excessive net

foreign debt. Sri Lanka's unusual economic situation has worsened in recent months, owing to mismanaged government finances and ill-timed tax cuts, as well as the impact of the COVID-19 pandemic and the Russia-Ukraine War. Depleting foreign exchange reserves, massive debt loads, currency devaluation, growing inflation, and a struggling economy have forced the residents to battle for necessities as well. Despite being a key player in the global tea and textile markets, Sri Lanka has been unable to export tea and textiles due to a severe economic crisis, creating an opportunity for the Indian tea and textile industry to tap into the market. Grippled by the crisis, Sri Lanka is losing orders to its competitor and neighbour, India. Indeed, India should seize the opportunity presented by the current circumstances. Although, it will be difficult for India to fill the gap created by the crisis in Sri Lanka. It may reap the benefits to some extent.

Note

Data presented in the study are publically accessible. The author states no competing interests and conflicts.

Reference

- Aryal, S. 2022.** "Regional Geopolitics and Sri Lankan Crisis: Options for India." South Asia Democratic Forum, FOCUS (F 81). Accessed August 4, 2022. <https://www.sadf.eu/focus-81-regional-geopolitics-and-sri-lankan-crisis-options-for-india/>.
- Bhardwaj, N. 2022.** "How Does the Crisis in Sri Lanka Impact India?" India Briefing News. Accessed August 6, 2022. <https://www.india-briefing.com/news/how-does-the-crisis-in-sri-lanka-impact-india-24786.html/>.
- Bhowmick, S. 2022.** "Understanding the Economic Issues in Sri Lanka's Current Debacle." ORF Occasional Paper No. 357. Accessed August 11, 2022. https://www.orfonline.org/wp-content/uploads/2022/06/ORF_OccasionalPaper_357_SriLanka.pdf.
- Business Today. 2022.** "Sri Lanka's crisis may provide opportunities for Indian tea exporters: Experts." Accessed August 29, 2022. <https://www.businesstoday.in/latest/world/story/sri-lanka-crisis-may-provide-opportunities-for-indian-tea-exporters-experts-328557-2022-04-04>.
- Central Bank of Sri Lanka. 2018.** "Importance of Foreign Remittances to Sri Lanka." Accessed August 24, 2022. <https://www.cbsl.gov.lk/en/workers-remittances>.
- Colombo Page. 2019.** "President decides to reduce VAT and eliminate several taxes to provide relief for the people." Accessed August 3, 2022. http://www.colombopage.com/archive_19B/Nov27_1574862111CH.php.
- Export Development Board (EDB) Sri Lanka. 2022.** "The Unrivalled Potential For Sri Lankan Exporters." Accessed August 10, 2022. <https://www.srilankabusiness.com/exporters/overview.html>.
- Huettemann, A., Pabasara, C., and Panwar, N. 2020.** "Sri Lanka - India Relations: Opportunities for a New Connectivity Strategy." LKI Policy Briefs, Series No. 27, 1-14. Accessed August 3, 2022. <https://lki.lk/publication/sri-lanka-india-relations-opportunities-for-a-new-connectivity-strategy/>.
- Indo-American Chamber of Commerce (IACC). 2017.** "Major Exports." Accessed August 8, 2022. <https://www.iaccindia.com/major-exports/>.
- India Brand Equity Foundation (IBEF). 2022.** "Apparel and Garment Industry and Exports." Accessed August 10, 2022. <https://www.ibef.org/exports/apparel-industry-india>.
- Kannan, S. 2022.** "As Sri Lanka's economy spirals into crisis, here's a snapshot of the export-import situation." India Today. Accessed July 18, 2022. <https://www.indiatoday.in/business/story/sri-lanka-s-deepening-economic-crisis-hits-its-imports-and-exports-1939725-2022-04-20>.
- Ramakumar, R. 2022.** "What's happening in Sri Lanka and how did the economic crisis start?" Business Standard. Accessed May 14, 2022. https://www.business-standard.com/article/international/what-s-happening-in-sri-lanka-and-how-did-the-economic-crisis-start-122041400213_1.html.
- Samaranayaka, D. 2020.** "A closer look at the economy after Covid-19." Colombo Telegraph. Accessed August 2, 2022. <https://www.colombotelegraph.com/index.php/a-closer-look-at-the-economy-after-covid-19/>.
- Sharma, S. 2022.** "Sri Lankan economic crisis explained in five charts." India Today. Accessed August 4, 2022. <https://www.indiatoday.in/diu/story/sri-lankan-economic-crisis-explained-five-gotabaya-rajapaksa-1933514-2022-04-04>.
- Shukla, S. 2022.** "India must seize the trade opportunity opening now." The Indian Express. Accessed August 6, 2022. <https://indianexpress.com/article/opinion/columns/india-must-seize-the-trade-opportunity-opening-7903289/>.
- Sultana, G. 2022.** "Economic Crisis in Sri Lanka: An Assessment." Policy Commons, Manohar Parrikar Institute for Defence Studies and Analyses. Accessed August 6, 2022. <https://policycommons.net/artifacts/2273308/economic-crisis-in-sri-lankaan-assessment/3033121/>.
- Tanwer, P. 2022.** "Lanka Crisis Opportunity For Indian Tea Industry." Accessed August 8, 2022. <https://opportunityindia.franchiseindia.com/article/lanka-crisis-opportunity-for-indian-tea-industry-34693>.
- The Indian Express. 2022.** "Explained: What led to Sri Lanka's economic crisis, and who's helping?" Accessed July 29, 2022. <https://indianexpress.com/article/explained/sri-lanka-economic-crisis-explained-7849208/>.

The Times of India. 2022. "Explained: How Sri Lanka fell into its worst economic crisis & what's next." Accessed August 2, 2022. <https://timesofindia.indiatimes.com/business/international-business/explained-how-sri-lanka-fell-into-its-worst-economic-crisis-whats-next/articleshow/91495670.cms>.

The Times of India. 2022b. "Sri Lanka's Economy is being crushed by war in Ukraine." Accessed August 23, 2022. <https://timesofindia.indiatimes.com/business/international-business/sri-lankas-economy-is-being-crushed-by-war-in-ukraine/articleshow/90283823.cms>.

Tyagi, A. 2022. "India - Knitting the future." Invest India. Accessed July 30, 2022. <https://www.investindia.gov.in/sector/textiles-apparel>.

UNDP. 2021. "COVID-19 Economic Impact on Sri Lanka." Accessed August 5, 2022. <https://www.undp.org/srilanka/publications/covid-19-economic-impact-assessment-sri-lanka>.

Vanamali, K. 2022. "How is Sri Lanka's Economic Crisis Affecting India?" Business Standard. Accessed 31 July 2022. https://www.business-standard.com/podcast/international/how-is-sri-lanka-s-economic-crisis-affecting-india-122032800038_1.html.

Weerakoon, D., Kumar, U., and Dime, R. 2019. "Sri Lanka's Macroeconomic Challenges: A Tale of Two Deficits." ADB South Asia Working Paper No. 63. Accessed 14 July 2022 <https://www.adb.org/sites/default/files/publication/493451/swp-063-sri-lanka-macroeconomic-challenges-two-deficits.pdf>.

Wijesinghe, A. 2022. "How the Russia-Ukraine Conflict Affects Sri Lanka." Southern Voice. Accessed 23 August 2022. <http://southernvoice.org/how-the-russia-ukraine-conflict-affects-sri-lanka/>.

World Bank. 2019. "Importance of Tourism to Sri Lanka's Economy." Accessed August 1, 2022. <https://www.worldbank.org/en/news/feature/2019/08/15/the-importance-of-tourism-to-sri-lanka-s-economy>.

Yadav, N., and Rai, V. 2022. "The Fallen Sri Lankan Rupee: Not Just Another Economic Crisis." ISAS Insights No. 715. Accessed 4 August 2022. <https://www.isas.nus.edu.sg/wp-content/uploads/2022/04/Insight-715.pdf>.

Yousuf, D. 2021. "Sri Lanka's Economic Crisis and Its Impact on India." Centre for Land Warfare Studies Issue Brief No. 313. Accessed 3 August 2022. https://www.claws.in/static/IB-313_Sri-Lankas.pdf.

Market Reactions to Green Bond Issuances in India: Insights from the BSE 200 Index

Ms. Megha Rani Patel
Research Scholar,
Department of Commerce
and Financial Studies,
Central University of
Jharkhand, Ranchi, India

Dr. Bateshwar Singh
Associate Professor,
Department of Commerce
and Financial Studies,
Central University of
Jharkhand, Ranchi, India

Dr. Ajay Pratap Yadav
Assistant Professor,
Department of Commerce
and Financial Studies,
Central University of
Jharkhand, Ranchi, India

Abstract

"India is the second-largest issuer of green bonds globally. This study examines the influence of green bond issuances by Indian companies on their stock market valuations and explores the underlying reasons for the market's response to these issuances." Stock prices of each company from the Bombay Stock Exchange (BSE) website, focusing on companies listed in the S&P BSE 200 index. For the analysis of this study, we have used the two methods. Firstly, the event-study methodology, considering time frames of eleven days, twenty-one days, and forty-one days. Further, we applied an OLS (Ordinary Least Squares) regression to identify significant CAR arising from events or external factors. Data analysis was conducted using R software. There was a significant negative effect on the stock market. Cumulative abnormal returns (CAR) were both statistically significant and negative. Additionally, we found that both amounts issued (AI), coupons, and growth have significantly impacted CAR with the issuance of GB. It's important to know how the market reacts when companies issue GB. This can help assess a company's worth and aid policymakers in setting rules for issuing GB in the Indian market.

Keywords: Key Words: Green Bonds, Stock Market Impact, Event Study Analysis, Sustainable Finance, Indian Financial Market, Market Reaction, Bombay Stock Exchange.

JEL Classification: G11, G12, Q56, Q01

Introduction

Company policies and strategies are increasingly impacted by environmental, sustainability, and governance (ESG) considerations (Hart and Zingales, 2017). Environmental sustainability is vital as climate change is creating long-term changes in weather patterns and global temperatures worldwide (Baulkaran, 2019). Worries about climate degradation are affecting human lives, leading governments to promote the use of Green Bonds (GB) to support sustainability. These are fixed-income bonds issued by companies that fund eco-friendly projects (Gianfrate and Peri, 2019). Additionally, corporate policies are more and more often taking into account ESG factors (Hart and Zingales, 2017).

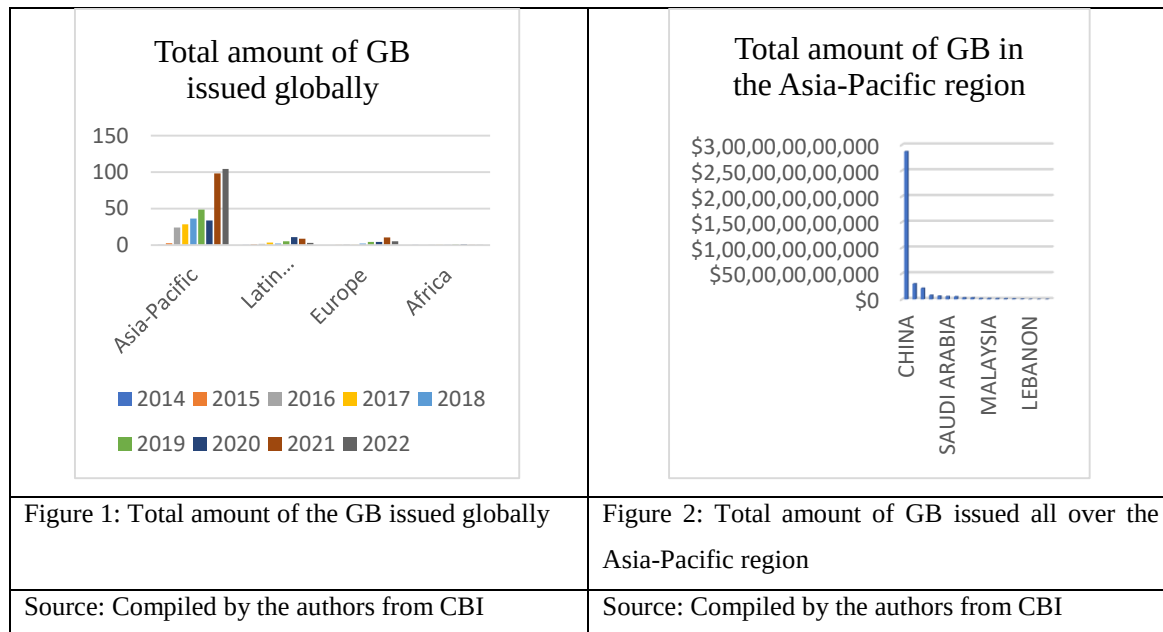
The global market for GB began to experience growth starting from 2007. This market is helping investors earn more money by backing sustainable development projects, attributed to the growing interest in green initiatives. Debts in financing can enhance organizational efficiency (Jensen and Zimmerman, 1985; Zwiebel, 1996; Lin et al., 2011), but strong bondholder control may lead to lower-risk investment selection, potentially harming shareholders' wealth (King and Wen, 2011).

GB are fixed-income, financial tools used specifically to raise funds to utilize for eco-friendly projects, with corporations issuing bonds to establish a "green image" and boost company value (Hamilton and Eriksson, 2011).

The GB market is guided using standards from the Climate Bond Initiative (CBI) and the standards framed by the International Capital Market Association (ICMA). However, outside groups like ESG research firms and environmental evaluators offer secondary opinions on GB releases, helping investors choose based on the "greenness" level. Still, this help has its limits. The ICMA has chosen green projects, and SEBI has laid down rules for issuing GB, with Indian financial institutions taking the lead in this field. GB brings several benefits like balancing assets and liabilities, drawing in long-term foreign investors, and boosting energy security.

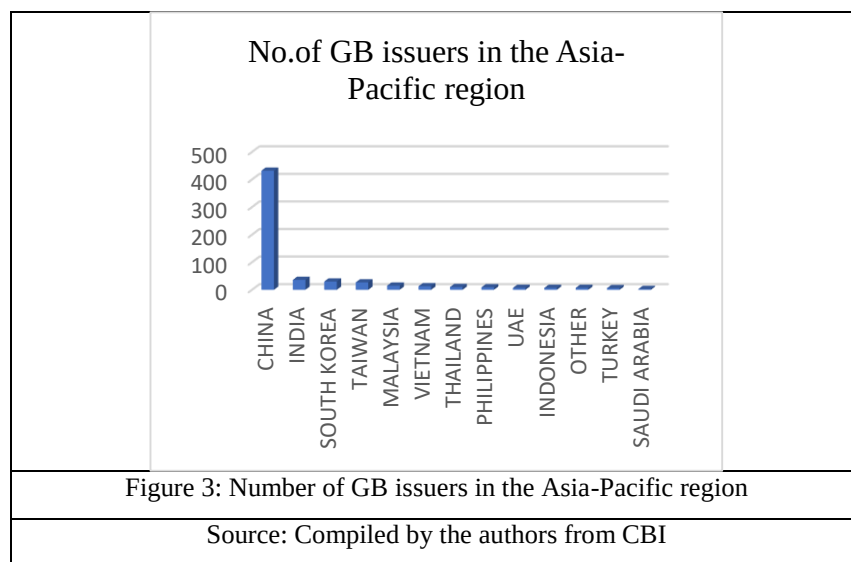
The GB sector commenced in 2013 when the European Investment Bank funded it with \$807.2 million. By January 2023, it had expanded to \$2.5 trillion, with emerging countries contributing \$74 billion, about 2% of the total spent on sustainability bonds, social bonds, and GB. Pioneers in issuing GB include the European

Investment Bank, World Bank, Electricite de France, and Bank of America. India holds a significant spot in the market, Yes Bank's debut issuance in the year of 2015, followed by IDBI, Punjab National Bank Housing Finance, Axis Bank, and more. India uses GB to fund shifts from fossil fuels to renewable sources, water management, transport, and infrastructure, attracting investment for environmental support. The country aims to spend \$4.5 trillion by 2030 for a climate-resilient economy, making GB a key financing option for both banks and non-banks, showing the market's rapid growth (Agarwal Singh, 2017; Bardhan et al., 2019).



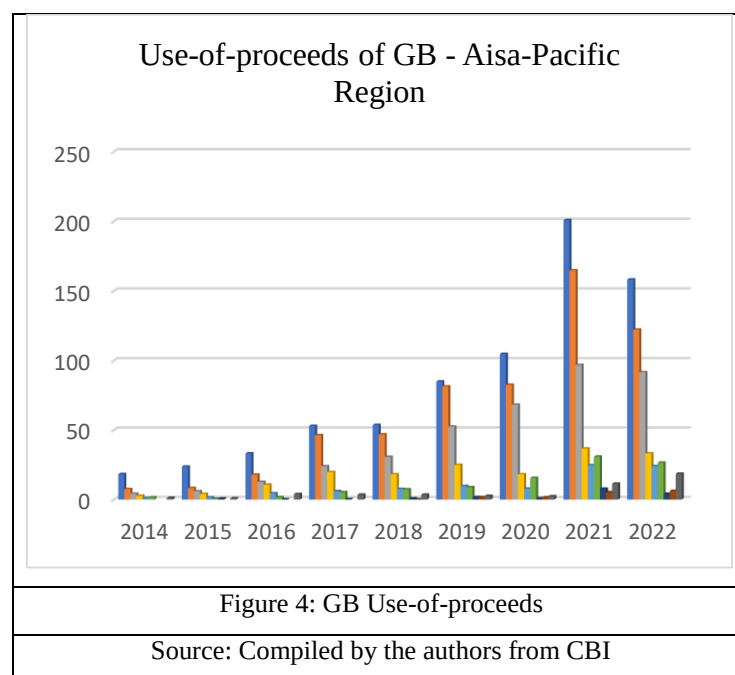
Worldwide, GB has been issued totaling \$377.4 billion. Over time, the value of these bonds in the Asia-Pacific region, as shown in Figure 1 has increased. Starting at \$0.5 billion in 2014, there was an abrupt increase in 2016, and the numbers grew steadily until they peaked in 2022 at \$104.6 billion. This area dominates in this measure. Africa's values have generally been low, peaking at \$1.2 billion in 2019. The numbers fell after 2019. Up to 2020, Latin America exhibited a consistent rise, reaching a high of 10.9. In 2021 and 2022, there was a decline nonetheless. Europe began with lower totals, reached a 10.6 high in 2020, and then had a fall in 2021 and 2022. The region with the most growth over time was Asia-Pacific, particularly from 2015 to 2022. In particular, the rise between 2020 and 2021 is noteworthy.

With a total issuance of almost \$286.91 billion in GB, China is clearly in a position to lead (see Figure 2). Comparatively, this is far higher than all the other nations on the list. With \$30.19 billion and \$21.55 billion, respectively, South Korea and India are next. Although they have a far smaller quantity than China, they are the second-largest issuers after China. GB have been issued by nations including the UAE, Indonesia, Saudi Arabia, Taiwan, Pakistan, the Philippines, Thailand, Vietnam, Malaysia, Turkey, Qatar, and Israel, and range in size from \$500 million (Pakistan) to approximately \$8 billion (UAE). In comparison to the other nations on the list, Lebanon, Fiji, and Kazakhstan all have very minor issuances, with Kazakhstan having the least at just \$474,000. Due to the active involvement of several Asian nations in environmentally friendly initiatives and sustainable finance, Asia has a significant role in the GB market. Countries like Israel, and Middle Eastern nations such as the UAE, Saudi Arabia, and Qatar are showing increasing interest in sustainable finance.



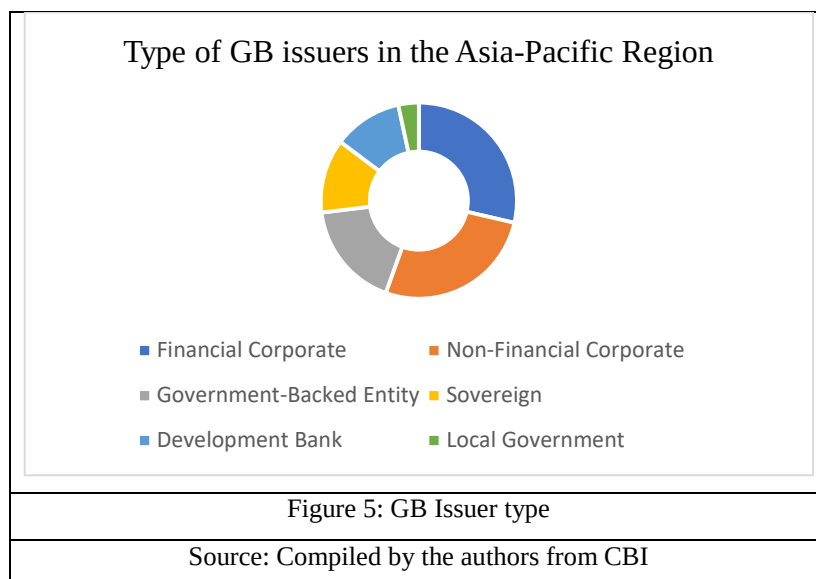
India in 2015, ranked in the top 10 emerging markets for GB, with \$7.7 billion issued to 2018, primarily by banks for renewable energy projects (The World Bank, 2018a, 2018b).

In 2023, India ranks second in the outstanding value of GB, behind China, contributing to the green environment through green finance investments. For a study analyzing shareholder wealth impact, see Figure 3.



The three main uses of the proceeds categories into buildings, transport, and energy and all together generated 77% overall green debt volume (see Figure 4). The market's proportion of adaptation-related investments has fallen from 81% in 2021 to 85% in 2020, with smaller categories gaining share as more issuers finance a wider range of projects.

Financial corporations generated 29% of 2022 green issuance volumes, with European corporations accounting for over half, as shown in Figure 5. European corporates, including German commercial bank Helaba and Danish power giant Orsted, were the leading issuers. Government-backed firms generated little under 20% of green issuance, with the EU's reopening of transactions driving the growth. Government-backed companies constituted the highest contribution to S&S bonds, with development banks second.



Several studies have been undertaken regarding market reactions to changes in investments in capital structures in finance. Most research has been conducted within developed markets, and as we can see over time, values have significantly increased in the Asia-Pacific area, Asia's emerging market. India ranks second in the outstanding value of GB, behind China, contributing to the green environment through green finance investments; however, event studies are rising for emerging markets. This research is being conducted to study how GB issued by Indian companies affects their stock market returns, essentially at the stock market's response to GB issued. This research will help in analyzing results that will be useful to other Indian companies who are deciding to raise capital using GB.

The study will be structured in sections where Section 2 will cover all the necessary literature reviews conducted on the topic. Section 3 will detail the data sets utilized during the study and the methodology applied in the research analysis. Section 4 will summarize and discuss the findings from the empirical analysis. Finally, Section 5 will conclude our research work.

Literature Review

Yu, H. et al. (2024) analyzed how the stock market responded to 595 GB issuances between 2014 to 2021. The study found that the initial market reaction was generally negative, especially for companies with poor or no history of issuing green bonds, although this reaction tended to improve over time. The research also showed that companies with strong environmental performance saw an increase in stock liquidity, suggesting that repeated issuances and the perceived reliability of the bonds' environmental benefits could be advantageous.

Jin, J., & Zhang, J. (2023) investigated the stock performance of Chinese companies issuing GB during the pandemic of COVID-19. Non-financial GB issuers experienced positive stock returns upon COVID 19 announcements revealing during pandemic or crises the investor have high confidence on firm with high CSR (Corporate Social Responsibility). Therefore, there is need of enhancement of green finance policies which will highlight the value of CSR in times of uncertainty

Verma and Bansal (2023) evaluated the impact of green-bond issue announcements on issuers' stock price movements, finding a strong positive impact in the Indian context. Kumar and Verma (2023) revealed that the stock prices of GB-issuing companies increase positively, and their lower coupon rates provide shareholders with a leverage advantage. Most research indicates positive stock price responses to increased financial leverage, while some find a negative relationship between financial leverage and stock market reactions. GB attracts investors seeking sustainable growth and eco-friendly projects, with oversubscription and increasing demand driving market price growth.

Cursi (2022) showed a positive impact of GB issuance on stock performance, indicating that investors see GB as an average of added-value finance, which attracts more investors and positively affects stock prices and hence the cumulative abnormal return (CAR).

Löffler, Petreski, and Stephan (2021) discussed the expanding demand for green bonds and the academic literature on the topic, highlighting that companies are contributing to green governance. It analyzed the

existence of greenium in primary and secondary bond markets. Findings from the study suggested GB with larger issue sizes are issued by lower rated entities. GB yield 15-20 basis points less than the conventional bonds therefore confirming presence of a greenium.

Cortellini and Panetta (2021) have shown the influence of GB issuance on investors' and issuer shareholders' wealth, demonstrating how GB issuances can impact both investors and the wealth of issuers' shareholders. Insights on the impact of environmental investments on financial markets and economic sustainability were discussed and the growing appeal of GB among diverse investors highlights their potential role under the Paris Climate Agreement and in portfolio diversification strategies.

Flammer (2020) addressed the primary drivers i.e., signaling, cost of funding, and greenwashing for the GB. Flammer (2021) further investigates the financial and environmental elements of corporate GB, indicating their rising appeal among long-term investors and sustainable practices ethical investors.

Tang and Zhang (2020) researched that stock prices tended to rise around the issuance of GB in 28 countries during 2007-2017, but noted that GB isn't necessarily a cheaper financing option, yet they positively affect stock prices and increase institutional ownership after issuance.

Agliardi and Agliardi (2019) developed a model for understanding the green bond pricing dynamics and the greenium. Determinants of GB value and their impact on issuer credit quality, cost effectiveness for funding the sustainable investments has been examined, revealing that enhanced credit quality, tax incentives, and increased environmental awareness significantly contribute to the growth of the green bond market. Enhanced credit quality, tax incentives, and increased environmental awareness significantly contribute to the growth of the green bond market.

Zerbib (2019) and Agliardi and Agliardi (2019) noted a trend of GB being oversubscribed upon their release, indicating that introducing GB into the market can draw in investors while also lowering financing costs for the issuing company. Zerbib (2019) studied the how bond market prices are affected by pro-environmental preferences using GB. Results showed a small negative yield premium on GB compared to conventional bonds, averaging 2 basis points. The trend was more evident in financial and low rated bonds giving insights that environment preferences slightly discourage investment in GB market.

Barua and Chiesa (2019) observed changes in the average issue size of GB over time, with higher-grade bonds having smaller average sizes, and found that the stock market reacts positively to certified GB announcements and negatively to non-certified issues, with most companies experiencing positive price effects.

Baulkaran (2019) analyzed the impact of GB announcements on stock market performance and noted the stock market's positive response to GB issuances, interpreting it as shareholders viewing it as value-enhancing and funds being used for profitable green projects.

Reboredo (2018) suggested potential spillover effects between the GB market and stocks, which could affect how a company's bond announcement impacts stock prices. The findings from the study reveal strong linkages with corporate and treasury markets but weak association with stock and energy market. Insights from the study reveals there is limited diversification benefits in treasury and corporate contexts but significant benefits in stock and energy sectors.

Bancel and Glavas (2018) employed agency and stakeholder theories to analyses the pre issuance determinants, identified the main drivers i.e., agency offerings and state ownership behind GB issuances, highlighted by the consistent negative correlation with cash dividend distribution. It added perspective to the understanding of the GB market dynamics.

Ben-Rephael et al. (2017) found that the market in developed countries typically reacts negatively to GB issuances, unlike in developing economies, likely due to investor valuation based on the initial issuance.

De Roon and Veld (1998) analyzed that warrant-bond loans and convertible bond loan announcements in the Dutch market provide positive but insignificant abnormal returns and significant positive abnormal returns, respectively. This findings of the study contrasts with the studies conducted in United States which report negative results. The positive outcomes in the Dutch market are linked to firm specific news which give insights that market and announcement significantly affect investor reactions.

Negative news on environmental issues adversely affects stock prices, while companies with strong environmental records enjoy better stock prices, as analyzed by Klassen and McLaughlin (1996) and Dasgupta et al. (2001). Dasgupta et al. (2001) examines in developing nations how capital markets reacts to the announcements made on environmental performance. There is a belief that regulatory incentives help in

pollution control but the results from the study suggested that informed market offer significant reputational and financial motivations. Hence there is need for improved public disclosure of practices particularly related to environment where regulation is limited.

Dann and Mikkelsen (1984) examined the effects of valuation with the issuance of convertible debt. The study described that financial markets are extremely reactive to disclosures of information in the market, with common shareholders experiencing large negative abnormal earnings on average following a new convertible debt public offering.

Table 1: Literature related to the Impact of Green Bond Issuances

Sl. No.	Year	Author(s)	Country	Reaction
1.	2024	Yu, H. et al.	International	Negative
2.	2023	Jin, J., & Zhang, J.	China	Positive
3.	2023	Kodiyatt et al.	India	Negative
4.	2023	Shankar, N., & Sharma, S.	India	Negative
5.	2023	Sreelakshmi, P., & Greeshma, R. J.	International	Negative
6.	2023	Verma, R. K., & Bansal, R.	India	Mixed
7.	2022	Chen, X. et al.	China, Hong Kong	Positive
8.	2022	Cicchello et al.	European	Mixed
9.	2022	Liu, M.	-	Negative
10.	2022	Wu, Y.	China, Global	Negative
11.	2022	Xi, B., & Jing, H.	China	Mixed
12.	2021	Antoniuk, Y., & Leirvik, T.	-	Negative
13.	2021	Yi, X., Bai, C. et al.	China	Positive
14.	2020	Glavas, D.	-	Positive
15.	2020	Lebelle et al.	International	Negative
16.	2019	Baulkaran, V.	-	Positive
17.	2017	Mohd Roslen et al.	Multi-country	Positive

Source: Compiled by Authors.

Research Objective

- To evaluate the impact of GB issuances on the stock prices of companies listed on the S&P BSE 200 index in the Indian market.
- To investigate impact of bond characteristics and firm-level financial indicators on CAR.

Hypothesis Development

To study the green bond (GB) issuance on stock prices in the Indian market, insights were drawn from existing literature that suggests a notable link between GB issuance and stock market reactions see Table 1. Studies like that of Glavas (2018) have shown that announcements related to corporate social responsibility (CSR), such as issuing GBs, can positively influence stock prices in the short term. This reaction is attributed to the positive perception by investors when companies engage in environmentally responsible activities, thereby improving their corporate image and attracting investment.

Further, Flammer (2021) provided empirical evidence that issuing GB not only signals a company's commitment to sustainable practices but also leads to significant cumulative excess returns on their stock. This finding underscores the potential financial benefits that accrue from adopting green initiatives, which can be seen as enhancing the company's value in the eyes of shareholders and investors.

Building on these insights and considering the increasing emphasis on sustainable investment in India, our hypothesis posits that similar positive effects would be observable in the Indian market. Given that the Indian market is becoming increasingly aware of and responsive to CSR and environmental sustainability, it is reasonable to hypothesize that GB issuances, which are a direct reflection of a company's commitment to environmental stewardship, would lead to a positive reaction in stock prices.

Therefore, synthesizing the theoretical and empirical evidence from global contexts and adapting it to the Indian economic environment leads us to hypothesize for first objective of the study as:

Hypothesis 1 (H1): The issuance of Green Bonds in the Indian market has an impact on the stock prices of the companies issuing these bonds.

For objective 2, firm specific financial indicators and bond characteristics were taken into consideration. Baulkaran (2019) examined CAR stemming from bond characteristics and firm level financial indicators. CAR served as the dependent variable, while independent variables for insights into the green bond market included factors like Coupon rate, Maturity (Years), A-rated bonds, Second Review, and Issue Volume (USD Million). Additionally, financial indicators of firms were taken into account as control variables, including firm efficiency proxied by return on assets (ROA) Asset Growth, and Financial Leverage was taken into consideration.

Data

This research study analysis relies on secondary data. We obtained individual stock prices from the Bombay Stock Exchange (BSE) official website, as all sampled companies are part of the S&P BSE 200 index. The dates when green bonds (GB) were issued were gathered from publications and periodicals like The Economic Times and India Times and were verified against the Bloomberg database and Climate Bonds Initiative (CBI) website, which holds verification reports for each company. Initially, our sample consisted of certified GB from the CBI database and other GB mentioned in articles from Business Standard, The Economic Times, and India Times, leading to a total of 57 issued GB. From these, we selected only companies listed in the S&P BSE 200, ending up with 17 GB samples. Other companies in the list were not listed on any exchange in India. Thus, this selection was based on the visibility and impact of firms within the S&P BSE 200, aiming to enhance the generalizability and applicability of our findings to significant market participants. These included eight issues from the banking sector, five from financial institutions, two from power production, one from Non-Banking Financial Companies (NBFCs), and one from a housing finance company. For our study's data analysis, we eventually chose 14 GB issued by nine companies between 2014 and 2023. We excluded three samples because historical stock prices were not available. The events in this context are the issuances of GB, and the event dates (t) are the dates these bonds were issued, as listed in Table 2. We obtained all bond ratings from Fitch Ratings. We delved into the influence of various financial indicators and market conditions on the performance and issuance of green bonds where we examined the firm-level indicators such as growth (efficiency), return on assets (ROA), and financial leverage, alongside factors specifically related to the GB-like maturity, amount issued, ratings, coupons, review. In the previous literature (Baulkaran, 2019; Eccles et al., 2012; Goss and Roberts, 2011; Kliger and Sarig, 2000) highlighted their significance in financial analyses related to green financing and sustainability investments.

Table 2: List of Companies selected in our study

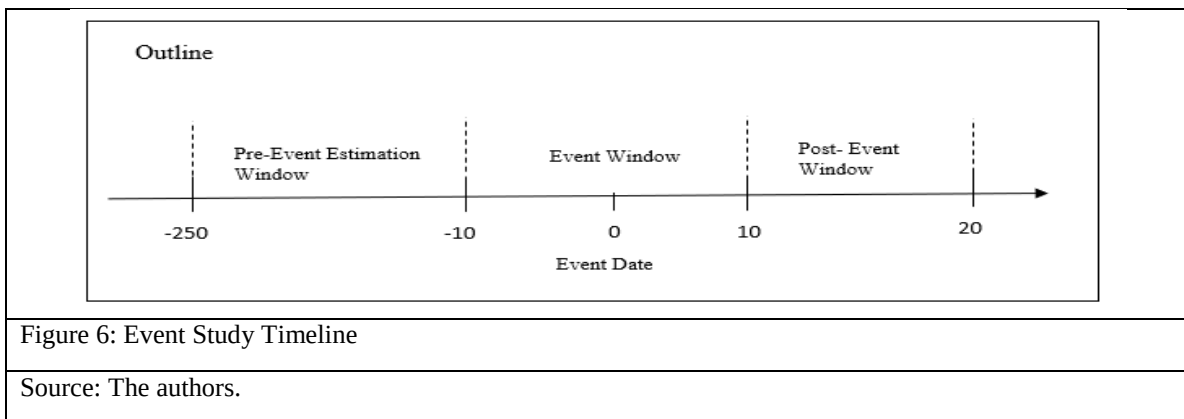
Company	Issue Date/Month/Year	Sector
Yes Bank	24/02/2015, 05/08/2015, 29/12/2016	Private Bank Sector
IDBI Bank	23/11/2015	Private Bank Sector
Axis Bank	23/05/2016	Private Sector Bank
NTPC Ltd	10/8/2016	Power Generation
Rural Electrification Corporation Limited	29/06/2017, 11/04/2023	Financial Institution
Power Finance Corporation	6/12/2017	Financial Institution
State Bank of India	30/07/2018, 28/09/2018, 28/03/2020	Public Sector Bank
Adani Green Energy	15/10/2019	Power Generation
Bajaj Finance	14/07/2016	NBFC

Source: The authors.

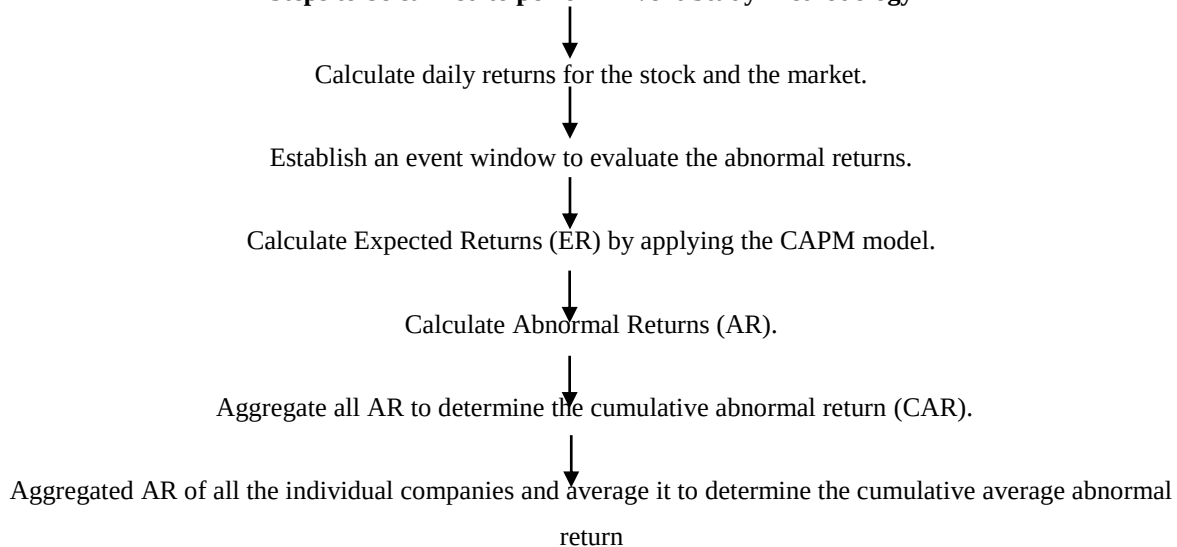
*Abbreviation: IDBI- Industrial Development Bank of India; NTPC- National Thermal Power Corporation

Methodology

To understand the financial effects on the value of a company, event studies examine stock market responses to significant corporate events. If a market is efficient, the value of an event is immediately reflected in a company's stock price. This approach serves dual purposes: it tests the Efficient Market Hypothesis (EMH), which is under scrutiny if abnormal returns persist post-event, and it assesses the impact of significant corporate actions or wider economic disruptions using short-term stock price data Kothari and Warner (2007). We applied the standard event study to examine stock prices around the issuance date to evaluate market reactions (Werner, 2010; Pandey and Kumari, 2021; Baulkaran, 2019; Verma and Bansal, 2023;). This method, rooted in the semi-strong form of market efficiency Fama (1965), suggests that earning regular excess returns is not feasible as newly available public information is immediately incorporated into prices. An event study identifies the event, event date, window, estimation window, and model specifically for green bonds (GB) issuances see Figure 6.



Steps to be carried to perform Event Study Methodology



Calculation of daily returns of stock and market: Firstly, we have calculated the daily returns of stock and market using Equation 1

Equation 1: $Daily\ Returns\ (r) = \ln(Ending\ Price \div Beginning\ Price) \dots\dots\dots (1)$

Establishment of Event window for expected return: In our analysis, we utilized data from 250 trading days before the event date. Our study aimed to examine the connection between market returns and stock returns before the event occurred. To achieve this, we established an event window Baulkaran (2019) that spanned 10

days before and 10 days after the event, as well as another window extending from 20 days before to 20 days after the event and reducing from 5 days before and 5 days after the event.

Calculating expected returns utilizing the CAPM model: There are several models for the estimation of the expected return. In our analysis, we have used the **Sharpe (1964) and Lintner (1975)**, CAPM model to calculate the expected returns using Equation 2

$$\text{Equation 2: } ER_i = R_f + \beta_i(ER_m - R_f) \dots\dots\dots (2)$$

Where: -

ER_i = expected return on investment

R_f = risk-free rate of return (We have used 91 days T-bills)

β_i = beta of the investment

$(ER_m - R_f)$ = market risk premium

Calculation of AR: AR for each day within the event window was calculated. The AR was calculated using Equation 3.

$$AR = \text{Actual return of the stock on day } t - \text{Expected Return of the stock on day } t \quad (3)$$

Calculation of CAR: The CAR is a method used to measure the total impact of an event by summarizing the abnormal returns over the event window. CAR was calculated using equation 4.

$$\text{Equation 4: } CAR = \sum AR \dots\dots\dots (4)$$

Calculation of test statistics: To determine the statistical significance of a CAR we tested its significance against zero by calculating the t-statistic using equation 5

$$\text{Equation 5: } t = CAR_t \div \text{Standard Error of } CAR_t \dots\dots\dots (5)$$

The CAR is considered statistically significant if the absolute value of the t-statistic exceeds the critical value from the t-distribution, which is typically 1.96 for a 95% confidence level. Here, the standard error is derived from the S.D. of the AR during their estimation window.

In this study, we used OLS (Ordinary Least Squares) regression, as applied in the similar study by Baulkaran (2019) to identify significant CAR stemming from a specific event or bond characteristics. CAR served as the dependent variable, while independent variables for insights into the green bond market included factors like Coupon rate, Maturity (Years), A-rated bonds, Second Review, and Issue Volume (USD Million). Additionally, financial indicators of firms were taken into account as control variables, including firm efficiency proxied by return on assets (ROA) Asset Growth, and Financial Leverage was taken into consideration.

$$\text{Equation 6: } CAR_i = \beta_0 + \beta_1 SR_i + \beta_2 A \text{ rated bonds}_i + \beta_3 Maturity_i + \beta_4 AI_i + \beta_5 Coupons_i + \beta_6 ROA_i + \beta_7 FL_i + \beta_8 Growth_i + \varepsilon_i \dots\dots\dots (6)$$

where i refers to an individual company, β 's are the coefficients of variables, ε is the error term, SR is the Second Review, AI is the amount issued, ROA is the return on assets and FL is the Financial Leverage.

Initially, the OLS regression was performed to examine the relationship between CAR and various financial indicators. The dataset was prepared and cleaned to ensure completeness and accuracy for the regression analysis. Preliminary data analysis included checking for missing values, understanding the data structure via the `str ()` function in R software, and summarizing the dataset with descriptive statistics. Cases with missing values were removed to maintain the integrity of the regression analysis. However, to address the issue of multicollinearity among the independent variables, we used the variance inflation factor (VIF). Residual plots and normal QQ plots were used to assess the assumptions of homoscedasticity and normality, respectively. Durbin- Watson test was used to check for serial correlation in the dataset and was observed that autocorrelation is absent. Robust standard errors were also applied in R to compute these robust standard errors using the HC1 method. The OLS regression was then run after checking for all the assumptions and to ensure the robustness of our findings.

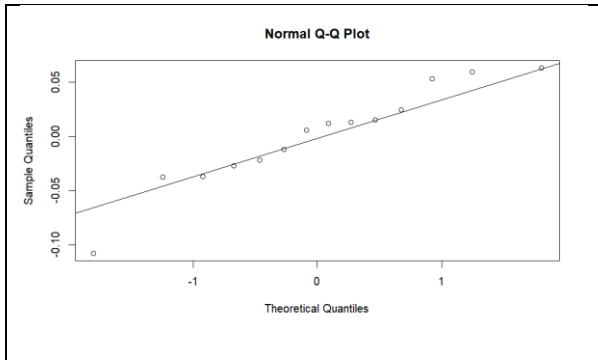


Figure 7: Q-Q Plot

Source: Authors.

Most points lie on or very close to the reference line in Figure 7, indicating that the residuals of your model (assuming these are residuals) are normally distributed.

Table 3: Check for multicollinearity

Variable	SR	A-rated bonds	Maturity years	AI	Coupons	ROA	Financial Leverage	Growth
VIF	2.973	2.850	3.550	4.302	4.064	4.851	2.320	2.364

Source: Authors.

The variation inflation factor is used to check multicollinearity. For each independent variable, the VIF value was found to be less than 10 see Table 3, implying the absence of multicollinearity.

EMPIRICAL RESULTS AND DISCUSSION

Table 4: CAR of selected GB issued

Company	Yes Bank	Yes Bank 1	Yes Bank 2	IDBI Bank	Axis Bank	NTPC	REC Ltd.	REC Ltd. 1	PFC Ltd.	SBI	SBI 1	SBI 2	Adani Green Energy	Bajaj Finance
{-10, 10}	-0.970	-0.943	-1.000	-0.934	-1.021	-0.930	-1.027	-0.804	-1.125	-0.906	-0.870	-0.893	-0.626	-0.928
{-5, 5}	-0.509	-0.564	-0.486	-0.506	-0.568	-0.412	-0.448	-0.335	-0.508	-0.469	-0.453	-0.558	-0.287	-0.456
{-20, 20}	-1.943	-1.870	-1.949	-1.872	-1.933	-1.856	-2.020	-1.628	-2.011	-1.868	-1.743	-1.703	-1.261	-1.730

Source: Authors.

The CAR (Cumulative abnormal return) values for the {-10, 10}, {-5, 5}, {-20, 20} in the Table 4 and window are negative for all companies, indicating that the stock prices generally experienced abnormal losses over this period. The negative AR (abnormal return) suggest that the market did not react favorably to these announcements, potentially perceiving them as bad news or reflecting broader market conditions. It becomes important to understand the effect of negative CAR across all the companies which could be due to firm-level conditions or the nature of the announcements.

Table 5: T-statistic results for the GB issued

Company	P-value	T-stat.	P-value	T-stat.	P-value	T-stat.
	{-10, 10}		{-5, 5}		{-20, 20}	
YES BANK	***	-13.3342	**	-8.09392	***	-23.4165
YES BANK 1	***	-25.0626	***	-17.2998	***	-20.9809
YES BANK 2	***	-16.3245	***	-13.7196	***	-27.1364
IDBI	***	-8.71799	**	-9.30757	***	-14.4932
Axis Bank	***	-19.6892	***	-15.88	***	-24.8434
NTPC	***	-20.0233	***	-15.159	***	-15.9034
REC Ltd.	***	-17.1037	***	-11.3582	***	-25.058
REC Ltd. 1	***	-14.8284	**	-6.2866	***	-21.0433
PFC Ltd.	***	-29.9203	***	-23.0997	***	-42.174
SBI	***	-12.1977	**	-7.38565	***	-18.4764
SBI 1	***	-12.6104	***	-11.6526	***	-18.4758
SBI 2	**	-4.27352	**	-3.16782	***	-6.53502
Adani Green Energy	***	-5.08651	*	-2.85744	***	-6.46785
Bajaj Finance	***	-20.1662	***	-11.2853	***	-10.2321

Source: Authors

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Yes Bank's entries—Yes Bank, Yes Bank 1, and Yes Bank 2—refer to three separate issuances of green bonds, which occurred on 24/02/2015, 05/08/2015, and 29/12/2016, respectively. REC Ltd. and REC Ltd. 1 represent two green bond issuances by REC Ltd., dated 29/06/2017 and 11/04/2023, respectively. Similarly, the entries SBI, SBI 1, and SBI 2 correspond to GB issued by the State Bank of India on 30/07/2018, 28/09/2018, and 28/03/2020, respectively.

The consistent negative CAR across all the event windows and companies indicates the negative reactions and significant t statistics and low p values further support the results in Table 5. PFC Ltd. and REC Ltd. showed the most substantial negative reactions this suggests companies the importance of clear, strategic communication when announcing green finance initiatives plus the findings suggest there are some specific factors related to announcements or company conditions that played a role in the market's reaction.

Table 6: T-statistic results of CAAR

Window	-10 to 10	-5 to 5	-20 to 20
CAAR	-0.927	-0.469	-1.813
CAAR t-statistic	-29.7	-21.449	-34.394

Source: Authors.

The consistent negative Cumulative average abnormal return (CAARs) and highly significant t-statistics across all event windows in Table 6 suggest that the market reacted adversely to the announcements of green bonds. The longer the window, the more pronounced the negative cumulative returns, indicating persistent negative sentiment. This could be due to investor concerns about the costs, risks, or implications of these green financing initiatives.

Companies should be aware of potential market reactions and consider strategic communication and investor education when announcing such initiatives to mitigate negative perceptions and highlight long-term benefits.

To understand the negative and significant market reaction to the issuance of green bonds, the study examined both firm-level indicators and insights into the green bond market. This approach aimed to identify the reasons behind the impact of market reaction resulting from green bond issuances.

Table 7: Statistical description

US \$	Minimum	1st Quartile	Median	Mean	3rd Quartile	Maximum	S.D
Section A- Firm-Level Indicator							
Financial Leverage	0.43	0.795	0.86	0.7973	0.885	0.9	0.152
Growth	0.03	0.05	0.11	0.1247	0.14	0.45	0.106
Section B- Insights into the GB Market							
Second Review	0	1	1	0.8	1	1	0.414
A-rated bonds	0	0	0	0.2667	0.5	1	0.457
Maturity years	5	5	5	6.067	7	10	1.791
Amount issued	14.22	18.07	19.67	18.94	19.98	20.44	1.616
Coupons	1.84	4.375	5.63	5.787	7.44	8.85	1.978
Return on assets	0.04	0.055	0.08	0.07133	0.085	0.11	0.021

Source: Authors.

In Table 7, the statistical description of the firm-level indicator in section A is in US dollars for the sample. In terms of financial leverage, the data ranges from 0.43 to 0.9 suggesting that most firms have a moderate to high leverage. The mean leverage of 0.7973 is close to the median, indicating a symmetric distribution around a relatively high leverage point. The relatively low standard deviation (S.D) of 0.152 points indicates uniformity in financial risk exposure among the firms. In terms of Growth Ranging from 0.03 to 0.45, with a significant standard deviation of 0.106 relative to the mean of 0.1247, it indicates a wide variability in growth rates among firms. This suggests differing capabilities in expanding operations, which is a critical indicator for potential sustainable investors.

In Section B insights into the GB market SR and A-rated bonds are categorical variables if green is certified by CBI will be 1 or else zero and A-rated bonds equal one if rates are above A or else zero. The median and third quartile values being 1 for both variables indicate that a majority of the bonds have undergone a second review and many are A-rated, suggesting a focus on quality and due diligence in the green bond market, GB are medium-term maturities which would reflect a balance between risk and reward that investors and issuers look in green investment. A larger amount of green bonds has also been issued to be directed towards sustainable projects and it is lucrative for investors of green bonds as it might compensate them for their protentional risks and a low SD of indicating consistent performance across the sector, as it signals to both current and prospective investors that green bonds offer reliable returns from assets use of proceed allocated in sustainable projects.

Table: 8 Regression of CAR for different event windows and firm and bond indicators

	Initial Standard Error				Robust Standard error				Financial Impact
	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat	
	{-10, 10}		{-20, 20}		{-10, 10}		{-20, 20}		
Second Review	-0.17985	-3.091*	-0.1154	-1.319	-0.17985	-2.7229*	-0.1154	-0.9521	Detracting
A-rated bonds	0.03027	0.625	-0.10223	-1.403	0.030274	0.5802	-0.10223	-1.4323	Mixed/Neutral
Maturity	-0.01871	-1.355	-0.05507	-2.652*	-0.01871	-1.1862	-0.05507	-2.2839	Detracting

years									ng
Amount issued	0.01634	0.97	0.052988	2.092	0.01634	0.8037	0.052988	1.8156	Enhancing
Coupons	0.02608	1.75	0.061517	2.745*	0.026082	1.7333	0.061517	3.8121*	Enhancing
Return on assets	-2.4096	-1.687	-0.28122	-0.131	-2.4096	-1.4907	-0.28122	-0.108	Detracting
Financial Leverage	-0.03025	-0.23	-0.00464	-0.024	-0.03026	-0.2635	-0.00464	-0.0226	Neutral
Growth	0.78117	4.132**	1.249109	4.393**	0.781173	7.3873***	1.249109	6.414**	Enhancing

Source: Authors.

In table 8. The coefficients do not change between the initial standard error and the robust standard error. This suggests that the estimates of the regression parameters are stable even when accounting for potential heteroscedasticity (unequal variances) in the residuals. Regardless of the measures of CAR, Growth is only consistent and is statistically significant. Using growth as a proxy of efficiency, indicating a strong and significant positive impact on the dependent variable (CAR). The positive association between Growth and CAR implies that firms experiencing higher growth rates tend to have more favorable market reactions, which could be interpreted as the market valuing or enhancing future potential and profitability brought about by growth similarly amounts issued and Coupons showed a positive relationship with CAR, indicating that increases in these factors are associated with positive AR, suggesting these are value-enhancing for the firms upon the issuance of green bonds. Second Review impact may diminish over a longer period but in a shorter period the coefficient is negative (-0.17985) and statistically significant at a conventional level (t-stat: -3.091*), suggesting that the second review hurts CAR within this window on the contrary to Second Review, maturity and coupon rate more relevant to investors over a longer horizon possibly due to perceived higher yields over time but second review and maturity years suggests these factors could detract value or investor perception when associated negatively with CAR. These results from Table 7 suggest that market participants react to immediate financial metrics and forward-looking indicators like growth prospects. The variable significance across different time windows also hints at evolving market perceptions, where immediate reactions might differ from more considered responses as more information becomes available or market conditions change.

Conclusion

This study aimed to assess whether issuing green bonds (GB) positively impacts the stock prices of the company issuing GB in the Indian market. We focused on GB issued by Indian companies between 2014 and 2022, noting that the Asia-Pacific region, with India as a key contributor, leads the global market in GB issuance. Employing the event-study methodology, we empirically analyzed stock market reactions to GB issuances, using the Capital asset pricing model (CAPM) to estimate the expected market return for these companies.

Our findings indicated that the CAR was negative and statistically significant, suggesting an unfavorable stock market response to the issuance of GB. The complexities involved in issuing green bonds suggest that external market conditions, the specifics of the bond issuance (like coupon rate) (Baulkaran, 2019), and broader investor perceptions about the issuer's environmental and financial strategy all play critical roles in influencing market reactions. This comprehensive view provides a strong justification for the negative CAR observed in your study, illustrating the need for firms to consider timing (Liu, M., 2022), market conditions, and investor sentiment when planning green bond issuances. This contradicts our null hypothesis that GB issuance has no impact on the issuing company's stock price in the Indian market our study was not consistent with Verma and Bansal (2023) that there are mixed market reaction results (Kodiyatt et al.,2024) results of the insignificant impact of the GB issuance in the market. The results diverge from Fama's (1965) semi-strong market efficiency theory, which posits that all public company information should be rapidly integrated into stock prices. However, our study shows that the event impact lasts up to 20 days post-issuance. Furthermore, we found that both amounts issued, coupons and Growth have significantly impacted the relationship between GB issuance and market response in the green bond market. To better understand the negative and significant market reaction to green bond issuances, the study delved into both firm-level indicators and broader insights into the GB market. Through this approach, it succeeds in unveiling the underlying reason impacting the market's response to green bond issuances.

GB emerged as crucial for promoting sustainable growth and funding projects that meet Sustainable Development Goals and India's Intended Nationally Determined Contributions, with an allocation of USD 2.5 trillion for climate action. GB might offer an advantage over traditional bonds by potentially increasing market demand. Green investors might be open to accepting lower returns for investments in projects linked with green use of proceeds (Zerbib, 2019; Ehlers and Packer, 2017).

Implications of the Study

Theoretical Implications: The study adds knowledge to the body's existing literature concerning GB and market efficiency. Empirical evidence shows the stock market reaction to GB issuances in the Indian context. The study tests Fama's (1965) semi-strong market efficiency theory where results show that the event impact lasts up to 20 days post-issuance suggesting the market may not recognize public information regarding GB. Furthermore, we found that negative CAR indicates different investor perceptions and behavioral biases which may not be captured as the CAPM model has been used in the study which calls for future research to study external market conditions that affect the market response to the issuance of the GB.

Practical Implications: The results from the study have significance for investors and portfolio managers as negative CAR post-issuance of GB suggests that investors in the Indian market treat conventional bonds and GB differently. Therefore, before investing in GB investors should conduct research so it can incorporate all the additional risk factors aligned with GB.

Managerial Implications: The findings from the study pinpoint the need for a strategic approach when they are issuing GBs. Issuers should be conscious of factors like coupon rate, and maturity to reduce negative market reactions and to positively influence the investors' perceptions there should be clear communications regarding environmental and financial benefits from the proceeds raised through GB.

Limitations and Future Scope of the Study

Future research should explore different asset pricing models to calculate expected returns, thereby enriching the existing literature. Additionally, employing larger samples could yield more conclusive results. This study examined the stock price reactions to GB issuance and exploring non-price factors such as credit ratings, reputation effects, and investor sentiment are yet to be explored.

Reference

- Agarwal, S., & Singh, T. (2017).** Unlocking the green bond potential in India. The Energy and Resources Institute (TERI). <https://www.teriin.org/projects/nfa/files/Green-Bond-Working-Paper.pdf>
- Agliardi, E., & Agliardi, R. (2019).** Financing environmentally-sustainable projects with green bonds. *Environment and development economics*, 24(6), pp 608-623. <https://doi.org/10.1017/S1355770X19000020>
- Antoniuk Y., & Leirvik T. (2021).** Climate Transition Risk and the Impact on Green Bonds. *Journal of Risk and Financial Management*, 14(12), 597. <https://doi.org/10.3390/jrfm14120597>
- Baker, M., Bergstresser, D., Serafeim, G., & Wurgler, J. (2022).** The pricing and ownership of US green bonds. *Annual review of financial economics*, 14, pp 415-437. <https://doi.org/10.1146/annurev-financial-111620-014802>
- Bancel, F., & Glavas, D. (2018).** Are Agency Problems a Determinant of Green Bond Issuance. *SSRN Electronic Journal*. Are-Agency-Problems-a-Determinant-of-Green-Bond-Issuance.pdf (researchgate.net)
- Bardhan, R., Debnath, R., & Jana, A. (2019).** Evolution of sustainable energy policies in India since 1947: A review. *Wiley interdisciplinary reviews: Energy and environment*, 8(5), e340. <https://doi.org/10.1002/wene.340>
- Barua, S., & Chiesa, M. (2019).** Sustainable financing practices through green bonds: What affects the funding size? *Business Strategy and the Environment*, 28(6), pp 1131-1147. <https://doi.org/10.1002/bse.2307>
- Baulkaran, V. (2019).** Stock market reaction to green bond issuance. *Journal of Asset Management*, 20(5), pp 331-340. <https://doi.org/10.1057/s41260-018-00105-1>
- Ben-Rephael, A., Da, Z., & Israelsen, R. D. (2017).** It depends on where you search: Institutional investor attention and underreaction to news. *The Review of financial studies*, 30(9), pp 3009-3047. <https://doi.org/10.1093/rfs/hhx031>
- Chen X., Weber O., & Saravade V. (2022).** Does It Pay to Issue Green? An Institutional Comparison of Mainland China and Hong Kong's Stock Markets Toward Green Bonds. *Frontiers in Psychology*, 13, 833847. <https://doi.org/10.3389/fpsyg.2022.833847>
- Cicchello A.F., Cotugno M., Monferrà S., & Perdichizzi S. (2022).** Credit spreads in the European green bond market: A daily analysis of the COVID-19 pandemic impact. *Journal of International Financial Management and Accounting*, 33(3), pp 383-411. <https://doi.org/10.1111/jifm.12150>
- Climate Bonds Initiative. Home. <https://www.climatebonds.net/>
- Cortellini, G., & Panetta, I. C. (2021).** Green bond: A systematic literature review for future research agendas. *Journal of Risk and Financial Management*, 14(12), 589. <https://doi.org/10.3390/jrfm14120589>
- Cursi, M. (2022).** Does ESG rating affect the stock market reaction to a green bond issuance?
- Dann, L. Y., & Mikkelsen, W. H. (1984).** Convertible debt issuance, capital structure change and financing-related information: Some new evidence. *Journal of Financial Economics*, 13(2), pp 157-186. [https://doi.org/10.1016/0304-405X\(84\)90022-9](https://doi.org/10.1016/0304-405X(84)90022-9)
- Dasgupta, S., Laplante, B., & Mamingi, N. (2001).** Pollution and capital markets in developing countries. *Journal of Environmental Economics and management*, 42(3), pp 310-335. <https://doi.org/10.1006/jeem.2000.1161>
- De Roon, F., & Veld, C. (1998).** Announcement effects of convertible bond loans and warrant-bond loans: An empirical analysis for the Dutch market. *Journal of Banking & Finance*, 22(12), pp1481-1506. [https://doi.org/10.1016/S0378-4266\(98\)00055-7](https://doi.org/10.1016/S0378-4266(98)00055-7)
- Dell'Atti S., Di Tommaso C., & Pacelli V. (2022).** Sovereign green bond and country value and risk: Evidence from European Union countries. *Journal of International Financial Management and Accounting*, 33(3), pp 505-521. <https://doi.org/10.1111/jifm.12155>
- Eccles, R. G., Ioannou, I., & Serafeim, G. (2012).** *The impact of a corporate culture of sustainability on corporate behavior and performance* (Vol. 17950, No. 1, pp. 2835-2857). <https://mikekrzus.com/downloads/files/HBS-Impact%20of-Culture.pdf>

- Ehlers, T., & Packer, F. (2017).** Green bond finance and certification. *BIS Quarterly Review September*. <https://ssrn.com/abstract=3042378>
- Fama, E. F. (1965).** The behavior of stock-market prices. *The Journal of Business*, 38(1), pp 34-105. <http://www.jstor.org/stable/2350752>
- Flammer, C. (2020).** Green bonds: effectiveness and implications for public policy. *Environmental and Energy Policy and the Economy*, 1(1), pp 95-128. <https://doi.org/10.1086/706794>
- Flammer, C. (2021).** Corporate green bonds. *Journal of financial economics*, 142(2), 499-516. <https://doi.org/10.1016/j.jfineco.2021.01.010>
- Gianfrate, G., & Peri, M. (2019).** The green advantage: Exploring the convenience of issuing green bonds. *Journal of cleaner production*, 219, pp 127-135. <https://doi.org/10.1016/j.jclepro.2019.02.022>
- Glavas, D. (2018).** How do stock prices react to green bond issuance announcements?. *Glavas, D.(2020). Green Regulation and Stock Price Reaction to Green Bond Issuance. Finance*, 1(1), pp 7-51. <https://doi.org/10.3917/fina.411.0007>
- Glavas, D. (2020).** Green regulation and stock price reaction to green bond issuance. *Finance*, 41(1), pp 7-51. <https://doi.org/10.3917/fina.411.0053>
- Goss, A., & Roberts, G. S. (2011).** The impact of corporate social responsibility on the cost of bank loans. *Journal of banking & finance*, 35(7), pp 1794-1810. <https://doi.org/10.1016/j.jbankfin.2010.12.002>
- Hamilton, I., & Eriksson, J. (2011).** Influence strategies in shareholder engagement: a case study of all Swedish national pension funds. *Journal of Sustainable Finance and Investment*, 1(1), pp 44-61. <https://doi.org/10.3763/jsfi.2010.0006>
- Hamilton, J. T. (1995).** Pollution as news: Media and stock market reactions to the toxics release inventory data. *Journal of environmental economics and management*, 28(1), pp 98-113. <https://doi.org/10.1006/jeem.1995.1007>
- Hart, O., & Zingales, L. (2017).** Serving shareholders doesn't mean putting profit above all else. *Harvard Business Review*, 12, 2-6. Hart Zingales 2017 Serving Shareholders HBR.pdf (arrunada.org)
- Hart, O., & Zingales, L. (2017).** Companies should maximize shareholder welfare not market value. *ECGI-Finance Working Paper*, (521). <https://dx.doi.org/10.2139/ssrn.3004794>
- Jensen, M. C., & Zimmerman, J. L. (1985).** Management compensation and the managerial labor market. *Journal of Accounting and Economics*, 7(1-3), pp 3-9. [https://doi.org/10.1016/0165-4101\(85\)90025-4](https://doi.org/10.1016/0165-4101(85)90025-4)
- Jin, J., & Zhang, J. (2023).** The Stock Performance of Green Bond Issuers During COVID-19 Pandemic: The Case of China. *Asia-Pacific Financial Markets*, 30(1), pp 211-230. <https://doi.org/10.1007/s10690-022-09386-4>
- King, T. H. D., & Wen, M. M. (2011).** Shareholder governance, bondholder governance, and managerial risk-taking. *Journal of Banking & Finance*, 35(3), pp 512-531. <https://doi.org/10.1016/j.jbankfin.2010.07.011>
- Klassen, R. D., & McLaughlin, C. P. (1996).** The impact of environmental management on firm performance. *Management science*, 42(8), pp 1199-1214. <https://doi.org/10.1287/mnsc.42.8.1199>
- Kliger, D., & Sarig, O. (2000).** The information value of bond ratings. *The Journal of finance*, 55(6), pp 2879-2902. <https://doi.org/10.1111/0022-1082.00311>
- Kothari, S. P., & Warner, J. B. (2007).** Econometrics of event studies. In *Handbook of empirical corporate finance* (pp. 3-36). Elsevier. <https://doi.org/10.1016/B978-0-444-53265-7.50015-9>
- Kodiyatt, S. J., Nair, B. A. V., Jacob, M. S., & Reddy, K. (2024).** Does Green Bond Issuance Enhance Market Return of Equity Shares in the Indian Stock Market? *Asia-Pacific Journal of Financial Studies*, 53(3), pp 390-409. <https://doi.org/10.1111/ajfs.12459>
- Kumar, M., & Verma, R. (2023).** Effect of Green Bond Issuance on Stock Returns of Indian Public Companies. *IUP Journal of Applied Economics*, 22(1). Effect of Green Bond Issuance on Stock Returns of Indian Public Companies. | IUP Journal of Applied Economics | EBSCOhost

- Lebelle, M., Lajili Jarjir, S., & Sassi, S. (2020).** Corporate green bond issuances: An international evidence. *Journal of Risk and Financial Management*, 13(2), 25. <https://doi.org/10.3390/jrfm13020025>
- Lin, C., Ma, Y., Malatesta, P., & Xuan, Y. (2011).** Ownership structure and the cost of corporate borrowing. *Journal of financial economics*, 100(1), pp 1-23. <https://doi.org/10.1016/j.jfineco.2010.10.012>
- Lintner, J. (1975).** The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. In *Stochastic optimization models in finance* (pp. 131-155). Academic Press. <https://doi.org/10.1016/B978-0-12-780850-5.50018-6>
- Liu, M. (2022).** The driving forces of green bond market volatility and the response of the market to the COVID-19 pandemic. *Economic Analysis and Policy*, 75, pp 288-309. <https://doi.org/10.1016/j.eap.2022.05.012>
- Löffler, K. U., Petreski, A., & Stephan, A. (2021).** Drivers of green bond issuance and new evidence on the “greenium”. *Eurasian Economic Review*, 11(1), pp 1-24. <https://doi.org/10.1007/s40822-020-00165-y>
- Makpotche, M., Bouslah, K., & M'Zali, B. (2024).** Long-run performance following corporate green bond issuance. *Managerial Finance*, 50(1), pp 140-178. <https://doi.org/10.1108/MF-12-2022-0588>
- Mohd Roslen S.N., Yee L.S., & Binti Ibrahim S.A. (2017).** Green Bond and shareholders' wealth: A multi-country event study. *International Journal of Globalisation and Small Business*, 9(1), pp 61-69. <https://doi.org/10.1504/IJGSB.2017.084701>
- Pandey, D. K., & Kumari, V. (2021).** Event study on the reaction of the developed and emerging stock markets to the 2019-nCoV outbreak. *International Review of Economics & Finance*, 71, pp 467-483. <https://doi.org/10.1016/j.iref.2020.09.014>
- Reboredo, J. C. (2018).** Green bond and financial markets: Co-movement, diversification and price spillover effects. *Energy Economics*, 74, pp 38-50. <https://doi.org/10.1016/j.eneco.2018.05.030>
- Roslen, S. N. M., Yee, L. S., & Ibrahim, S. A. B. (2017).** Green Bond and shareholders' wealth: a multi-country event study. *International Journal of Globalisation and Small Business*, 9(1), pp 61-69. <https://doi.org/10.1504/IJGSB.2017.084701>
- Shankar, N., & Sharma, S. (2023).** Impact of green bonds issuance on stock prices - Evidence from India. *AIP Conference Proceedings*, 2763(1), Article 60002. <https://doi.org/10.1063/5.0159422>
- Sharpe, W. F. (1964).** Capital asset prices: A theory of market equilibrium under conditions of risk. *Journal of Finance*, 19, pp 425-442. <https://doi.org/10.1111/j.1540-6261.1964.tb02865.x>
- Sreelakshmi, P., & Greeshma, R. J. (2023).** Green Bonds: A Propitious Financial Instrument of Climate Finance. *Vision*. <https://doi.org/10.1177/09722629221138679>
- Tang, D. Y., & Zhang, Y. (2020).** Do shareholders benefit from green bonds?. *Journal of Corporate Finance*, 61, 101427. <https://doi.org/10.1016/j.jcorpfin.2018.12.001>
- The World Bank. (2018a, November 16).** From evolution to revolution: 10 years of green bonds. From Evolution to Revolution: 10 Years of Green Bonds (worldbank.org)
- The World Bank. (2018b., November 27).** From evolution to revolution: 10 years of green bonds. From Evolution to Revolution: 10 Years of Green Bonds (worldbank.org)
- Verma, R. K., & Bansal, R. (2023).** Stock market reaction on green-bond issue: Evidence from Indian green-bond issuers. *Vision*, 27(2), pp 264-272. <https://doi.org/10.1177/09722629211022523>
- Werner, S. P. (2010).** The event study methodology. In *Short Selling Activities and Convertible Bond Arbitrage: Empirical Evidence from the New York Stock Exchange* (pp. 53-66). Wiesbaden: Gabler. https://doi.org/10.1007/978-3-8349-6003-0_3
- World Bank. (2023, April 10).** From India to Indonesia: Green bonds help countries move toward sustainability. Climate Stories | Green Bonds (worldbank.org)
- Wu, Y. (2022).** Are green bonds priced lower than their conventional peers? *Emerging Markets Review*, 52, Article 100909. <https://doi.org/10.1016/j.ememar.2022.100909>

- Xi, B., & Stephan, H. (2021).** Research on the impact of green bond issuance on the stock price of listed companies. *Kybernetes*, 51(4), pp 1478-1497. <https://doi.org/10.1108/K-12-2020-0900>
- Yi X., Bai C., Lyu S., & Dai L. (2021).** The impacts of the COVID-19 pandemic on China's green bond market. *Finance Research Letters*, pp 42, 101948. <https://doi.org/10.1016/j.frl.2021.101948>
- Yu H., Burlacu R., & Enjolras G. (2024).** Green Bond Issuances: A Promising Signal or a Deceptive Opportunity? *Business and Society*. <https://doi.org/10.1177/00076503241255072>
- Zala, P., & Vel, R. (2020).** Empirical Evidence on Announcement Effect: The Case of Green Bond Offerings by Indian Companies. *Indian Journal of Research in Capital Markets*, 7(1), pp 38-47. Empirical-Evidence-on-Announcement-Effect-The-Case-of-Green-Bond-Offerings-by-Indian-Companies.pdf (researchgate.net)
- Zerbib, O. D. (2019).** The effect of pro-environmental preferences on bond prices: Evidence from green bonds. *Journal of banking & finance*, 98, pp 39-60. <https://doi.org/10.1016/j.jbankfin.2018.10.012>
- Zwiebel, J. (1996).** Dynamic Capital Structure under Managerial Entrenchment. *The American Economic Review*, 86(5), pp1197–1215. <http://www.jstor.org/stable/2118286>

The Influence of Knowledge Management Enablers on Knowledge Sharing: An Empirical Analysis of Hospitality Sector

Dr. Jitender Kaur

Assistant professor, Department of
Commerce and Management, Khalsa
College Patiala, Punjab, India

Dr. Parminder Singh Dhillon

Head and Assistant Professor, Department
of Tourism Hospitality and Hotel
Management, Punjab University Patiala,
Punjab, India

Abstract

Knowledge management has been one of the most debated organizational behaviour concepts in the last decade, still, in the hospitality and tourist business, it has not garnered the same level of empirical research and applications as in other sectors. The present paper examines the relationship between four knowledge management enablers and knowledge sharing behaviour. By using non-probability purposive sampling to collect the data, 410 hospitality and tourism industry professionals working in Punjab and Chandigarh and Smart-PLS version 3.3.2 was used to analyze the data. Findings reveal that knowledge management enablers “organizational culture”, “organizational structure”, “information technology” and “top management support” have significant influence on knowledge sharing. This paper emphasizes the importance of four key knowledge management enablers in the hospitality and tourism sector. According to the findings of this paper, top management must signal knowledge value, promote a knowledge-based culture and structure, and implement a knowledge-oriented information system in order to assist knowledge sharing behavior in the tourism and hospitality industries.

Keywords: Knowledge sharing, Organizational culture, Knowledge management enablers, Information technology, Organizational structure and Top management support.

Introduction

In the contemporary knowledge-intensive era, organizations must effectively mobilize their knowledge resources in order to gain a sustainable competitive advantage (Kumar, M., Mamgain, P., Pasumarti, S. S., & Singh, P. K. 2024). Knowledge is the essential component for organizational survival (Yeboah, A. 2023; Islam et al., 2021; Ahmad & Karim, 2019; Angels et al., 2017; Asrar-Ul-Hag et al., 2016). The rise of knowledge-oriented economic systems in the 21st century, knowledge resources have gained considerably more relevance and are the main focus of scholars as compared to traditional resources, for instance financial and physical (Yasir, 2017; Nisula & Kianto, 2015; Johnston & Blumentritt, 1998). Knowledge has recently come to be seen as a crucial managerial resource (Yeboah, A. 2023) and the foundation for generating competitive advantage and financial value (Bock et al., 2005; Eisenhardt & Santos, 2002; Drucker, 1993). Knowledge management has therefore existed for all of recorded time (Wiig, 1997) and has grown to be a crucial aspect of any organization's operations (Yeboah, A. 2023; Asrar-Ul-Hag et al., 2016). As a result, businesses focus on the value of their skill and make it distinct to set their products apart from those of rivals (Yeboah, A. 2023; Rafique et al., 2018). Since the quantity and quality of knowledge that an organization has at its disposal greatly affects its efficacy and success (Yeboah, A. 2023). Knowledge based economies are heavily reliant on the significance of KM systems such as the creation, sharing and usage of knowledge (Yeboah, A. 2023; Deng & Lu, 2022; Yasir, 2017). Knowledge-based economy, focus on qualitative inputs like innovation and human capital despite of traditional economies which relied on quantitative inputs such as labour, capital and land (Gardner, Verma, & Payne, 2006; Ogunyomi & Bruning, 2015). In this knowledge-based economy, knowledge management is regarded as one of the most significant assets and a complement to its commercial activities (Farooq & Tripathi 2024 ; Mehmood et al., 2022). Among other resources like capital, machinery, materials, and assets, it is becoming the most important resource for organisational success.

Furthermore, in the literature, there is a plethora of evidence showing information sharing and spreading is an important basis for organisational survival (Cabrera & Cabrera 2005). According to Leonardi (2014), KS behaviour empowers members of any group to capitalise on and leverage knowledge-assets. In order to deal with the economic transformation organization's fundamental difficulties, prior empirical investigations have discovered a causal association between KMEs (organisational culture, organisational structure, information technology and top management) and knowledge sharing (Yasir, 2017; Ho, Kuo, Lin, and Lin, 2010; Skarlicki & Latham, 1997).

The Hospitality and tourism sector is a knowledge-intensive sector because of the service provider nature, where delivery of service occurs as a consequence of contact between clients and the workforce, and where the workforce must be familiar with clients' demands to accomplish client fulfilment (Kahle, 2002; Kotler, et al., 1999). Hospitality and tourism organisations interact with a number of service sectors such as (online travel agencies, entertainment, convention agencies, tour operators, airlines, retail, and local sightseeing agencies) to achieve the final service goods, some of which compete and others collaborate. Due to the significant impact and usage of communication and information technology, one common trait of tourism and hospitality organisations with these service providers is especially prominent: their service procedures are becoming more knowledge-intensive or knowledge-based (Kahle, 2002; Sheldon 1997). In light of current developments in KM literature and practice, which provide recent perspectives and methodologies, tourism and knowledge management academics must shift their conventional focus on knowledge management as “a management concept exclusively applicable within individual firms.” In the studies of tourism and hospitality sectors, knowledge management (KM) must be broadened to include interorganizational challenges like stocks and flows of knowledge within organisational networks. As a result, the question of what kind of knowledge should be gained and focused on to differentiate the organization from its competitors may arise (Ruhanen and Cooper, 2004).

The practice and study of KM has grown rapidly in most organizations (Hjalager, 2002; Bouncken, 2002; Hallin & Marnburg, 2008; Grizelj, 2003; Ruhanen & Cooper, 2004; Yun, 2004), especially from a multinational and manufactured viewpoint (Nonaka & Takeuchi, 1995), except for tourism and hospitality industries. Researchers from the tourism and hospitality industries have recommended reasons why knowledge management is limited in practice and research (Grizelj 2003; Ruhanen & Cooper, 2004). To validate the impact of knowledge facilitators on KS, the majority of the research confirms the direct relationship. Some of them have shown that KME's have a significant influence on KS behaviour (Pan & Scarborough, 1998; Lee & Choi, 2003), while others have hypothesized that most KME's have an insignificant influence on KS behaviour in a direct association (Pan & Scarborough, 1998; Lee & Choi, 2003; Tan & Md. Noor, 2013).

Thus, the link between KME's and KS in the hospitality and tourism companies is investigated in this paper. The paper has been divided into distinct sections to create an argument in order to accomplish the intended objectives of this investigation. The literature and conceptual framework of KME's and KS are discussed in the second section. It also outlines the theoretical framework we discussed in terms of organisational structure, culture, and technical facilitators of KME's and KS. Research method is presented in the third section. Results and findings are the subject of section four, while discussion, implications, future directions, and limitations are the focus of section five.

- **Theoretical Framework and Conceptual Model**
- **Knowledge Sharing (KS)**

KS is referring to “employees transforming work-related ideas and experiences into understandable and applicable forms for the knowledge receivers” (Farooq & Tripathi., 2024; Hao et al., 2019). KS is seen as a social exchange where workers share their knowledge, expertise, and experiences within the company (Yeboah, A. 2023; Y. Lee et al., 2021). Researchers describe KS as a method of communication among various parties involved in the development of information by a source (one party) and receiving knowledge by the receiver (other party) (Usono, Sharratt, Tsui, and Shekhar, 2007). Knowledge sharing, according to Ibrahim and Heng (2015), is defined as “a mutual discourse among organisational members that allows them to receive knowledge from other members”. KS allows organisational people to capitalise on and utilize knowledge assets (Cabrera & Cabrera 2005). We operationalized KS in the present paper as a practice related to the substitution of knowledge and know-how held by organization members as well as the distribution of important information for the greatest possible use and common benefits (Krogh, Ichijo, & Nonaka, 2000). According to Balle et al. (2020), knowledge sharing lacks a clear definition and can be understood in a variety of ways, such as knowledge donation, which entails sharing one's intellectual capital with others and consulting own intellectual capital when gathering it (Farooq & Tripathi, 2024). This review, which synthesized the literature, used the definition given by (Nguyen et al., 2021), which says that “knowledge sharing is an employee-to-employee learning procedure to assist one another to enhance their potential, solve problems and boost work performance”. Sharing knowledge thus promotes innovation and long-term success (Islam et al., 2021). Employees, groups, and organizations all benefit from increased creativity, performance, and innovation when knowledge is shared. However, many employees withhold their knowledge despite the organization's efforts to promote knowledge sharing (Farooq & Tripathi 2024).

- **Knowledge Management Enablers (KME)**

KME's are described as interesting elements that enable people to share knowledge assets (KS) and serve as a foundation for the start of KM operations inside a company (Yasir 2017; Alegre, Sengupta, & Lapiedra, 2013). The ability to begin and encourage knowledge management activities was demonstrated through enabling factors (Al-Hakim & Hassan, 2013). KME's play an important function in the growth of knowledge creation & development (Yeh, Lai, & Ho, 2006), and they also have an influence on the organization's KM process and system (Syed-Ikhsan et al. 2004). Knowledge management enablers (KME) are organisational methods for continually promoting knowledge and encouraging acquisition, conversion (Palacios-Marques, Soto-Acosta, & Merigo, 2015), production, application, protection, and sharing of knowledge inside a company (Gold, Malhotra, & Segars, 2001). According to Sahibzada et al. (2022), construction organizations can accomplish a variety of strategic goals in many processes by utilizing knowledge management (KM) enablers like employees' knowledge, motivations, ability to make effective decisions, and strategic planning. Enablers of KM offer the infrastructure needed to constantly improve the efficiency of information circulation processes in the company. Knowledge management (KM) strategies rely on social ecology, such as culture, method, and structure, in addition to technology (Gupta and Govindarajan, 2000). Knowledge management enablers boost the capabilities of knowledge generation and knowledge processes (Lee & Choi, 2003). Knowledgeable worker productivity and KM procedures are impacted by KM enablers. (Sahibzada et al., 2022). Organizational culture, structure, support of top management, and technological information support are all knowledge management enablers.

- **Organizational Culture and Knowledge Sharing**

"Organizational culture is a complex whole which includes knowledge, belief, art, morals, law, custom, and any other abilities and habits acquired by man as a member of society". According to Chong et al. 2000, just deploying software and hardware is insufficient to enable improvement, new development, and organizational changes, but it is essential to cultural changes. The bulk of the accomplishment of information sharing is intimately tied to culture (Alavi and Leidner 2001). Consequently, the success of KM is reliant on organisational culture, trust, and cooperation at all levels. Organizational culture is bolstered by the vision and mission of the organization, as well as by the design and implementation of procedures and managerial practices; additionally, it is supported by the values and ethics of the organization (Adeinat & Abdulfatah, 2019) as well as the beliefs that make up their identity, such as staff evaluation, motivation, and performance standards. (Ibarra et al., 2023; Mubarak & Sabraz Nawaz, 2019). Knowledge management (KM) activities should be encouraged and supported by organisational culture (Gold, Malhotra & Segars, 2001). A culture that encourages people to share their expertise is critical for performance and creativity (Dang, Le-Hoi, and Kim, 2018). According to previous research, one of the most essential elements influencing the outcomes of the KM process is a knowledge based corporate culture (Gold, Malhotra, & Segars, 2001; Davenport & Prusak, 1998; Lee & Choi, 2003; Holsapple & Joshi, 2004). A few knowledge management scholars believe that a firm's culture has an imperative influence on the success of information sharing (Pan & Scarbrough, 1998; Chase, 1997; Holsapple & Joshi, 2000;). Based on literature, we propose that:

Hyp1: Organizational culture was significantly related to knowledge sharing

- **Organizational Structure and Knowledge Sharing**

The hierarchic connections, formal rules and regulations, reporting links, duties, roles, and authority that exist inside an organisation, as well as policies, processes, and reward systems, are examples of an OS. The structure of an organization can either help or hinder the organization's knowledge management efforts (Lee & Choi, 2003; Gold, Malhotra, & Segars, 2001). Changes in the organizations structure, for example, transitioning from hierarchical to flatter networked forms, are commonly assumed by knowledge management theorists to be vital for the successful transmission and development of knowledge inside the company (Nonaka & Takeuchi, 1995; Grant, 1996). Employee views of organisational procedures are influenced by organisational structure, which affects on individual performance (Gold et al., 2001). Because the organisational structure can influence human behaviour, it should be built to ensure that information flows and is transferred efficiently (Casselman and Samson, 2007; Iftikhar et al., 2003). A flexible organisational structure stimulates knowledge sharing and makes knowledge management (KM) approaches easier to adopt (Davenport and Prusak 1998). Hence, we propose that:

Hyp2: Organizational structure was significantly related to knowledge sharing

- **Top Management Support and Knowledge Sharing**

The main enabling characteristic of the industry that has a substantial influence on KS behaviour is TMS (top management support) (Eisenberger, Cummings, Armeli, & Lynch, 1997). Top management support includes top-level executives' presence and involvement in organizational activities (Jarvenpaa & Ives, 1991). To the

degree that they are involved in knowledge sharing activities in the tourist and hospitality sectors, TMS is regarded as a key aspect in guaranteeing the accomplishment of KM. The creation of a KM-friendly culture is the responsibility of top management. Organizational leaders must foster an independent atmosphere with a flexible work environment, as well as provide key enablers (Nguyen & Mohamed, 2011). Leaders must encourage employees to learn from one another while also developing their skills (Zhang and Jiang, 2015). According to Jambekar and Pelc (2006), middle management plays a vital function in the company by keeping an eye on the flow of data and knowledge. Encouraging staff to share their expertise, top and middle management should give appropriate incentives, formal training, and on-the-job training (Nakano, Muniz & Dias Batista 2013). Based on the findings of earlier literature identifying the association between top management support and KS, we anticipate that top management support will stimulate KS. As a result, we recommend that:

Hyp3: Top management support was significantly related to knowledge sharing

- **Information Technology Support and Knowledge Sharing**

IT plays a noteworthy role in promoting KM operations (Lee & Choi, 2003). According to Teh and Yong (2011), information technology is critical for the development of KM systems. The IT (information technology) KM enablers that facilitate the incorporation of information and knowledge into the industry, as well as play a vital function in the knowledge creation, transfer, storage, and safe-keeping of the industry's knowledge resources, are part of the technology component of knowledge management enablers. Information technology (IT) skills are essential for promoting resilience, ambidexterity, and organizational performance in organizations(Duru & Nimo, 2023; Trieu et al. 2023). According to Zack (1999), appropriate information technology may improve businesses' capacity to communicate and develop knowledge, but it cannot ensure that organisations are managing the correct information an exact way. The technological system inside an organisation (Gold et al. 2001), determines how knowledge moves across the company and how information is accessible. According to Odiri (2022), performance is significantly and favourably impacted by the use of information and communication technology (ICT) by organizations. The most noteworthy advancements brought about by ICT were enhanced customer satisfaction, better service delivery, and increased flexibility in the operations of most organizations. In the tourist industry, knowledge management entails the exchange of information among personnel; nevertheless, technology plays a critical role in gaining access to necessary data. Based on the literature, we assume a connection between Information technology systems and knowledge sharing. Thus, we recommend that:

Hyp4: Information technology support was significantly related to knowledge sharing

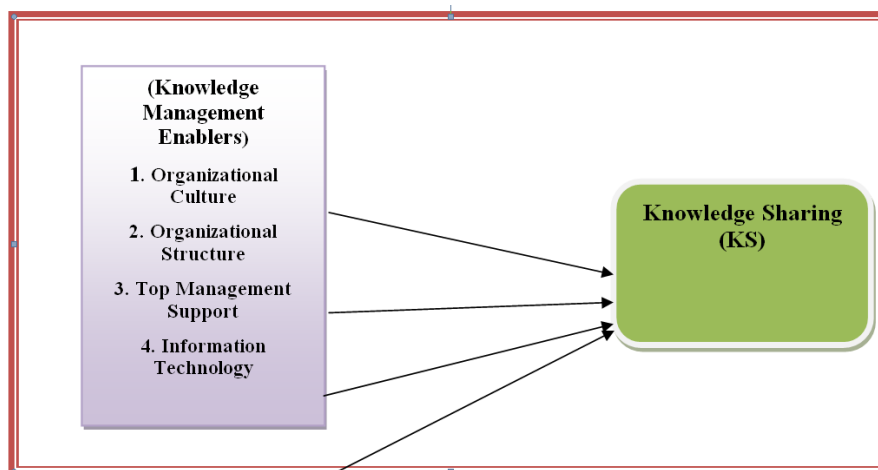


Figure1. Research Model

- **Methodology**
- **Sample**

Individuals working in tourism and hospitality companies in Punjab and Chandigarh comprised the sampling unit. Data was collected from major cities in Punjab and Chandigarh through an online survey questionnaire during November to December 2023 applying a “non-probability purposive sampling approach”. Finally, out of the 600 distributed questionnaires, we were able to collect 410 questionnaires.

- **Instrument**

The 23 survey items utilised in this paper were derived from and modified from prior research. All the statements were rated on a "5-point Likert scale", with "1" representing "strong disagreement" and "5" indicating "strong agreement". (Yang & Chen 2007) designed five statements to determine the knowledge sharing behaviour of tourism professionals. A sample item is "organizational employees share business proposals and reports with each other". Four items measuring knowledge based organization culture were adapted from (Lee, Gon Kim, and Kim., 2012); for example, "our company provides various education programmes for the performance of tasks." Similarly, four items from (Ho et al., 2014) were used to measure organizational structure, "In our company, the majority of activities are covered by formal procedures and regulations." While four items measuring management support were adapted from (Lee, Gon Kim, and Kim., 2012). A sample item is "Top management of our company supports and encourages knowledge management practises in the organization". To measure technology support, six items were adapted from (Lee, Gon Kim, and Kim., 2012). The survey item sample is "IT provides an environment which enables cooperative work in my organization."

- **Respondent's Characteristics**

The participants in this paper were the employees of the tourism and hospitality industries (table 1). The number of male participants (n = 309, 75%) was considerably higher than the number of female participants (n = 101, 25%). The bulk of the participants were found to be between 30 and 40 years old (n = 211, 51.4%), followed by 30 years (n = 96, 23.4%), and only (19.7%) were the age between 40 and 50 years. The respondents' educational qualifications were required for this study since it covers workers' perspectives on KME's and KS. It can be shown that (n = 210, 51.2%) of the respondents had a post-graduate degree and (n = 187, 45.6%) of the participants had a graduation degree as a minimum qualification. The mass participants (48.2%) were middle level managers, followed by a manager (36.5%). The researcher took into account the response of participants with at least one year of experience. The respondents' experiences were essential for this study because it represents workers' opinions of KME's and KS. Most of the participants (n = 162, 39.5%) have above five years of experience in organizations, followed by those with between 1 and 5 years (n = 141, 34.3%).

Table1. Participants Characteristics

Variable	Categories	Count	%
Gender	Male	309	75.3%
	Female	101	24.6%
Age-wise	Below 30 years	96	23.4%
	Between 31 to 40 years	211	51.4%
	Between 41 to 50 years	81	19.7%
	Above 50	22	5.3%
Education	Diploma	8	1.9%
	Under-graduate	187	45.6%
	Post-graduate	210	51.2%
	PhD-degree	5	1.2%
	Others	0	0%
	Middle level manager	198	48.2%

Designation	Manager	150	36.5%
	Branch Manager/HOD/MD	55	13.4%
	Director/CEO/CFO	7	1.0%
Work experience	Above 1to 5 years	141	34.3%
	Between 6 to 10 years	162	39.5%
	Between 11 to 20years	77	18.7%
	Between 21 to 30 years	21	5.0%
	Above 30years	9	2.0%

- **Results and Findings**

According to Ringle et al. (2005) Smart PLS (3.3.2 version) was used to assess the proposed associations. PLS path modeling can be assessed and evaluated in two steps of modeling: the measurement model and the structural model (Henseler, Ringle, & Sinkovics, 2009).

- **Study Measurement Model Analysis**

Measurement model analysis serves the purpose of empirically establishing the measures of association between “constructs and indicators,” (Hair et al., 2014). Apart from portraying the hypothesized relationship, it provides the quality criteria for model evaluation. The analysis of the measurement model includes assessing the “internal consistency reliability” established either through “Cronbach’s alpha” or “composite reliability” (CR), “convergent validity” through “indicator reliability” and “average variance extracted” (AVE), “discriminant validity” through cross loading and Fornell locker criteria,”(Hair et al., 2019). Measurement model analysis is most important as it paves the way for structural model analysis. As we now know, the structural model analysis cannot be performed till the “reliability and validity of the constructs are established. The measurement model analysis provides the evidence related to the quality of the model,” (Ringle et al., 2012).

- **PLS Algorithm for Measurement Model & Path Coefficient**

First, the PLS Algorithm was conducted using Smart PLS to evaluate the “measurement model” for analyzing the “internal consistency” based on reliability & validity. All constructs in the study were organized as per the proposed conceptual model to test the hypothesized relationship among constructs in the study. PLS algorithm to check the quality aspect of the model; it serves the purpose of confirmatory composite analysis (CCA) like “confirmatory factor analysis” (CFA) for covariance based structural equation modeling (CB-SEM).

- **Indicator Loading Assessment Based on the Measurement Model**

The first step in measurement model analysis is to ascertain the indicator loading. It is observed that the indicator loading of 0.708 and above is acceptable since the “constructs can explain more than 50% of the variance of indicators,” (Hair et al., 2017). But PLS-SEM requires the researcher to take a more conservative view as it depicts little higher loading. But at the same time, it is possible to retain more indicators resulting in high content validity in the case of reflective constructs (Black & Babin, 2019). In the present study, almost all indicators that showed an indicator loading of more than 0.70 have been retained. However, the universal threshold level of indicator loading is kept as 0.70 to have better content validity. All indicator loadings were found to be above the expected level of 0.708.

- **Internal Consistency**

Internal Consistency is the first criterion to be evaluated in the measurement model. The ideal measure that has been used is Cronbach’s alpha. It gives a rough estimate of reliability, but it has been considered a lower bound, and a new measure composite reliability (CR) is widely used to assess, the reliability (Henseler et al., 2014). The interpretation of CR is similar to Cronbach’s alpha and its values range from 0 to 1. The CR values more than(.70) acceptable in structure equation modeling (Hair et al., 2019; Bibi et al., 2018; Hair et al., 2014; Gefen et al., 2000; Hair et al., 2010).

Table 2 depicts the corresponding Cronbach's alpha, composite reliability AVE of all the constructs. Convergent validity (CV) is ensured when CR is more than 0.7 (Bibi et al., 2018; Hair et al., 2014; Gefen et al., 2000; Hair et al., 2010). In our study, composite reliability of all research constructs was found to be more than 0.80. This suggested that the internal consistency of the scale is very high. According to Barclay, Higgins, and Thompson (1995), the AVE evaluates the variation represented by the indicators related to measurement error, which is also higher than the required limit (0.5).

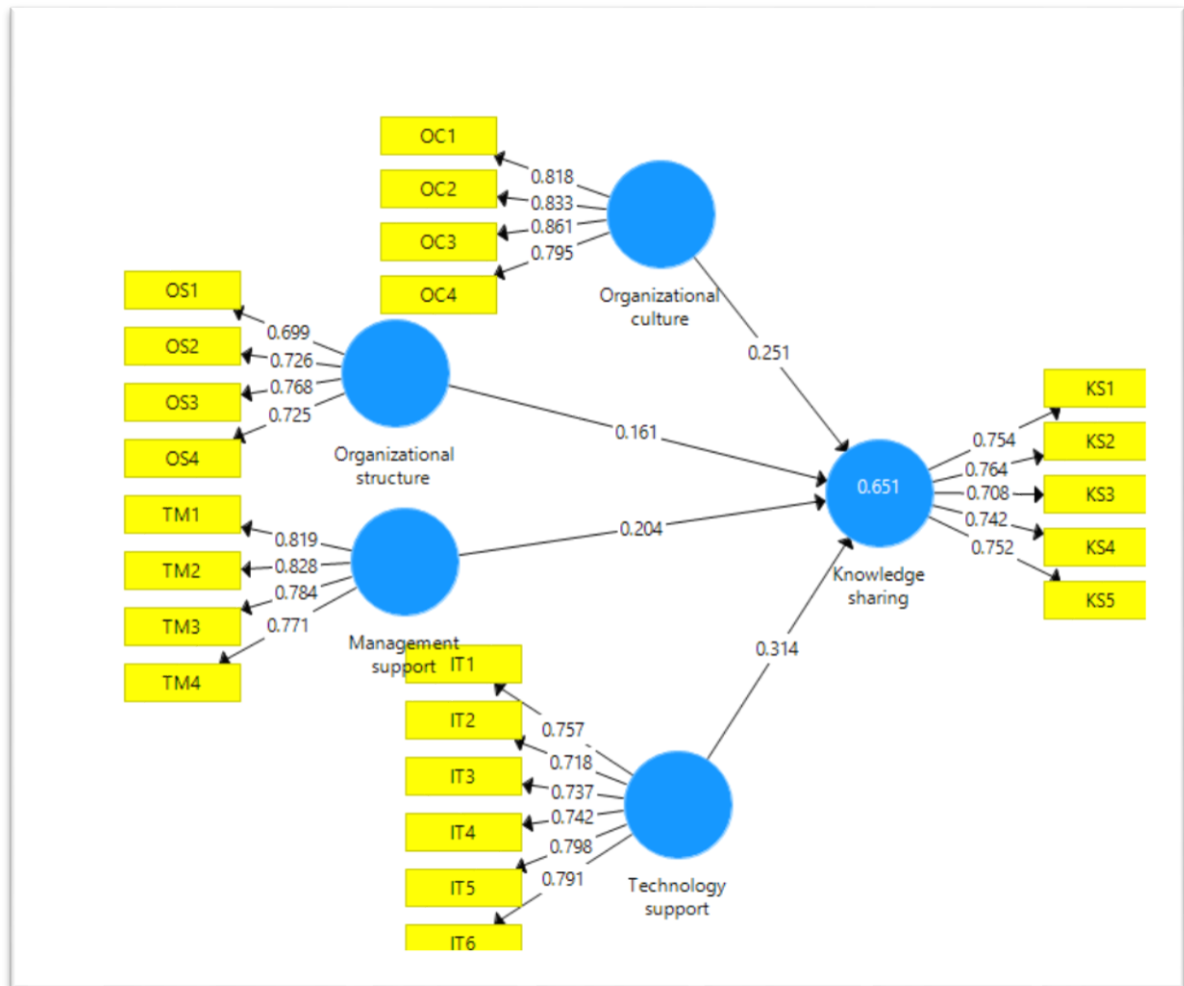


Figure2. PLS Algorithm

Table 2 Measurement Model Result

Construct	Indicators	Loading/ Weights	Cronbach's alpha	CR	AVE
Organizational culture	OC1	0.818	0.846	0.896	0.684
	OC2	0.833			
	OC3	0.861			
	OC4	0.795			
Organizational structure	OS1	0.699	0.707	0.820	0.533

	OS2	0.726			
	OS3	0.768			
	OS4	0.725			
Top management support	TM1	0.819	0.815	0.878	0.642
	TM2	0.828			
	TM3	0.784			
	TM4	0.771			
Information Technology	IT1	0.757	0.852	0.890	0.574
	IT2	0.718			
	IT3	0.737			
	IT4	0.742			
	IT5	0.798			
	IT6	0.791			
Knowledge sharing	KS1	0.754	0.799	0.861	0.554
	KS2	0.764			
	KS3	0.708			
	KS4	0.742			
	KS5	0.752			

- **Discriminant Validity**

Similarly, discriminant validity refers to how distinct a latent concept is from other latent constructs (Duarte & Raposo, 2010; Hair et al., 2018). It shows the “distinctiveness” of the construct (Hair et al., 2014). Viewed in this perspective, discriminant validity “assessment can be regarded as the final step for the quality evaluation of measurement models having reflective contracts. The traditional methods used to establish discriminant validity are cross-loading and Fornell-Lacker criteria (1981), which have been used in multivariate analysis. Cross-loading is the first approach and indicates greater loading of the indicator with its construct compared to other constructs measuring the concept. The AV (average variance) of each concept and its measurements must be higher than the variance of the construct and other constructs, according to the premise of this proposal. Table 3 shows that the AVE square root surpasses the correlations for each construct, representing that the concept has acceptable discriminant validity (Hair et al., 1998; 2010). The Heterotrait-Monotrait Ratio introduced by is another option for dealing with discriminant validity difficulties in variance-based SEM (Henseler, et al.2015). The exact HTMT threshold value is controversial; some publications advocate a value of 0.85(Kline, 2011) and others (Gold et al. 2001; Teo et al. 2008) suggest a value of 0.90. In this study, the Heterotrait-Monotrait values were well within the limits, thereby establishing the uniqueness of all the constructs as per the empirical standards as represented in (Table4).

Table 3. Fornell and Lacker’s (1981)

Construct	KS	TM	OC	OS	IT
Knowledge sharing (KS)	0.744				
Top Management(TM)	0.686	0.801			

Organizational culture(OC)	0.704	0.673	0.827		
Organizational structure (OS)	0.655	0.626	0.626	0.730	
Information Technology (IT)	0.73	0.674	0.684	0.665	0.758

Table 4. HTMT Ratio of Correlation

	Knowledge sharing	Top Management	Organizational culture	Organizational structure	Information Technology
Knowledge sharing					
Top Management	0.837				
Organizational Culture	0.850	0.802			
Organizational structure	0.861	0.82	0.807		
Information Technology	0.874	0.802	0.800	0.854	

• Structural Model Assessment

Once the validity and reliability of the constructs have been established, it is pertinent to analyze the structural model. The major outcomes of “structural model analysis are the relationship between the constructs,” and the predictive power of the model. (Henseler et al., 2016). The structural model gives a series of equations showing the “interrelationship between the independent and dependent variables”. These can be considered as several multiple regression equations. These can be considered as several multiple regression equations. These equations help to simultaneously estimate a series of multiple regression equations that are separate but interdependent (J. Hair et al., 2018). Unlike CB-SEM, “PLS-SEM maximizes the variance of endogenous constructs,” by minimizing the error terms. Though the goodness of fit measures is not applicable in PLS-SEM, the analysis through PLS-SEM is assessed based on its ability to predict endogenous constructs (Sarstedt et al., 2014). In the following stage, the structural model was examined. Table (5) and Fig. (2) Show outcomes of the structural model. As shown in Table 4, there is a substantial correlation between top management and knowledge sharing (beta = 0.204, t = 4.373, and p < 0.01). The findings also revealed that organizational culture knowledge sharing has a strong and positive association (beta = 0.251, t = 5.081, and p < 0.01). The findings also revealed that organizational structure and knowledge sharing had a strong and positive link (beta = 0.161, t = 3.627, and p < 0.01). Furthermore, a strong and positive relationship was discovered between information technology and knowledge sharing behavior (beta = 0.314, t = 6.029, and p 0.01).

Table 5: Path Coefficients

Relationship	(SO)	(SM)	(STDEV)	(T –values)	(P-Values)	(D)
Top Management support -> Knowledge sharing	0.204	0.205	0.047	4.373	0	Supported
Organizational culture -> Knowledge sharing	0.251	0.251	0.049	5.081	0	Supported
Organizational structure -> Knowledge sharing	0.161	0.163	0.044	3.627	0	Supported

Information Technology support -> Knowledge sharing	0.314	0.311	0.052	6.029	0	Supported

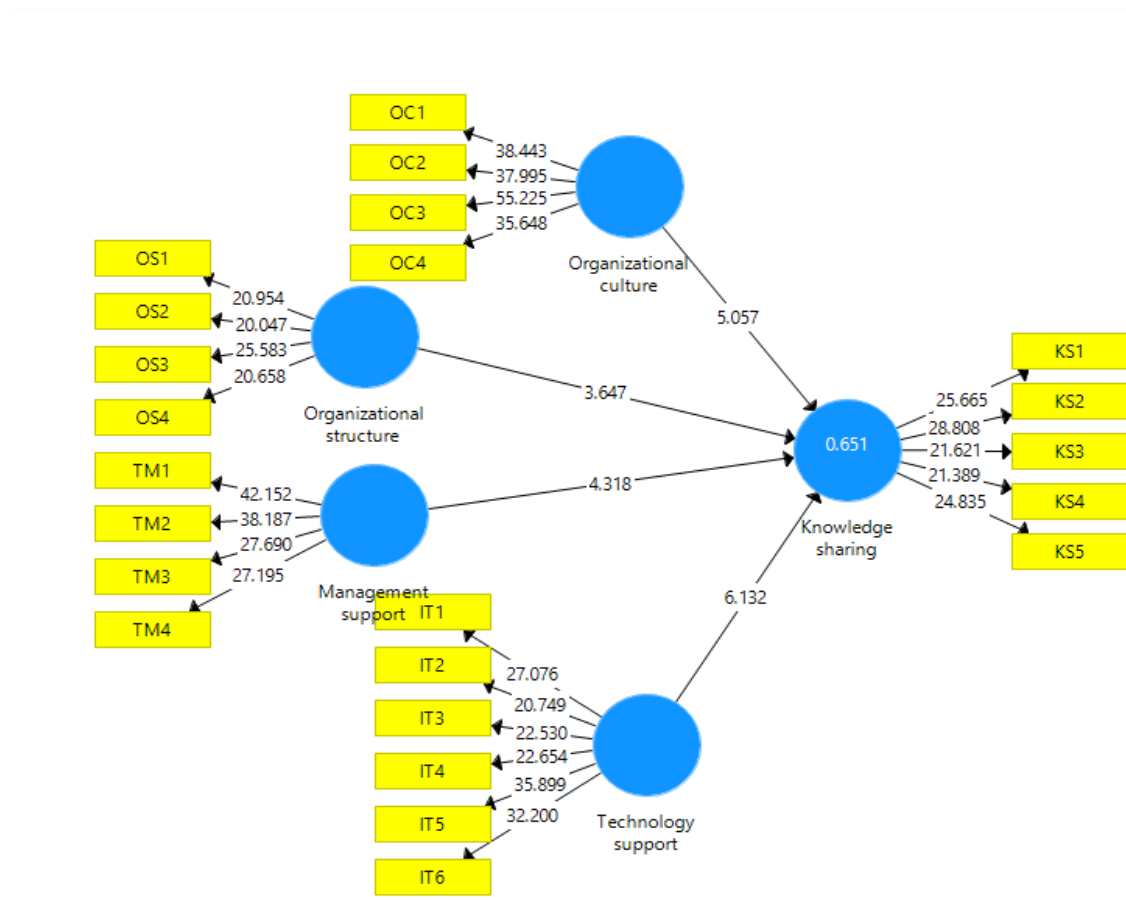


Figure 3 (Bootstrapping)

• Discussion

Given the complex challenges that are facing in the current era, knowledge sharing can serve as an important driver of sustainable organizational performance and competitive advantage.

Therefore, there is a recent surge in KM research to focus on exploring factors and the mechanisms that can influence knowledge-sharing behavior. The purpose of the present research was to determine the influence of KM enablers: top management support, knowledge-oriented culture, knowledge-based structure and knowledge-based information system on knowledge-sharing behavior. The present paper contributes to the corpus of knowledge in a variety of ways. For starters, we analyzed the KME's and KS sharing, which have a direct and favorable relationship (KS). Knowledge management enablers help organizations speed up their knowledge management processes (Ho, Kuo, Lin, & Lin, 2010). The results are discussed in detail in light of proposed hypotheses and earlier academic literature as follows:

Hypothesis1: proposed a positive effect of knowledge organizational culture management enablers on knowledge sharing behaviour. The finding revealed a positive association between organizational culture and KS. The paper's findings are in line with the results of previous studies (Yasir, 2017). It revealed that culture has a powerful, energizing force for the encouragement of KS deeds within the organization. Organizational culture plays an important role in facilitating KM processes such as knowledge sharing (Abdelwhab Ali et al., 2019) and improving innovation performance (Ghasemzadeh et al., 2019). Knowledge-oriented culture is a specific form of organizational culture, which can be defined as a complex set of human values, behaviors and attitudes, that fosters collaboration among organizational members, nurtures knowledge sharing and facilitates solutions to problems (Chang and Chuang, 2011; Ho, 2009; O'Dell and Grayson, 1998). KS is critical to the success of KM,

and a trusted culture serves as a facilitator (Bose, 2004). The administration of the tourism industry should encourage a culture that facilitates KS behaviour between members. This finding supports the argument that organizational culture characterized by knowledge exploration and sharing, trust and openness, empowerment and participatory decision-making fosters employees' risk-taking behaviors and individuals' ambidexterity (Aureli et al., 2019; Gil-Marques and Moreno-Luzon, 2013; Schnellbacher et al., 2019), which enable organizations to develop new products and services with better quality (Bhatti et al., 2020).

Hypothesis 2: The proposed hypothesis 2 organizational structure was significantly influenced by knowledge-sharing. The results of this hypothesis revealed a strong association between structure and KS. It indicated that the flexible organizational structure of an organization promotes knowledge-sharing behavior within an organization and assists in the implementation of knowledge management practices (KMP). Organizational structure is also important for its processes (Adhikari, 2010) and knowledge creation (Supapawawisit et al., 2018), knowledge sharing (Arntzen et al., 2009; Fullwood et al., 2013). Adhikari (2010) advocates the importance of both formal (physical layout of offices) and informal (communities of practice) organizational structures to facilitate social interaction.

Hypothesis 3: proposed hypothesis 3 is a top management knowledge management enabler positive and significant effect on knowledge-sharing behavior. The study findings indicated that the positive and imperative relationship between top management and KS behaviour was maintained. The current finding is in line with previous studies (Yasir, 2017). These findings emphasize the role of knowledge value that organizational leadership or top management signals to their employees through organizational strategies and policies (Zia et al., 2020). Such knowledge-based support from top management or leadership can foster employees' commitment to demonstrate knowledge exploring and sharing behaviors, leading to increased innovation performance (Singh et al., 2020; Zacher et al., 2016). The results suggest that demonstration of knowledge value on the part of top management facilitates knowledge exploration and exploitation (Donate and de Pablo, 2015; Sahibzada et al., 2020a) and fosters employees' proactively, innovativeness and risk-taking behavior, which results in innovation speed and quality (Cheng and Yang, 2019; Shan et al., 2016). And it's suggested that tourist professionals should develop associations with other professionals and supervisors on the foundation of mutual trust that encourages professionals to share useful expertise with co-workers and management.

Hypothesis 4: Furthermore, the proposed Hyp4 Information technology support significant influence on knowledge sharing and the findings of this study reveal that information technology (IT) systems play a vital role in encouraging KM activities that facilitate the incorporation of information (Harrison and Daly, 2009) and knowledge in the industry as well as in the production, transmission, storage, and preservation of the firm's knowledge assets. Effective IT ensures the access and interchange of essential information. The present conclusion is in line with others (Yasir, 2017). Technology is viewed as an enabler for KM (Arntzen et al., 2009; Adhikari, 2010; Ramachandran et al., 2013), and its processes, knowledge creation (Tian et al., 2009; Supapawawisit et al., 2018) and knowledge sharing (Fullwood et al., 2013). Appropriate information and communication technologies can help universities to move towards a knowledge-based learning organization, if they can achieve a 'good fit' between information technology (IT), socio-organizational factors, and a sustainable organizational culture (Arntzen et al., 2009; Adhikari, 2010).

• **Practical Implications**

The goal of this research paper, as stated in the introduction, was to learn more about the influence of KME's on KS. KMEs are critical to the advancement of KM systems (Tan & Md. Noor, 2013). Based on the significant association among KMEs and KS, this paper gives insight to HR practitioners and policymakers on how to consider these KMEs to encourage tourist sector personnel to share their expertise. Management should foster an internal atmosphere that encourages information exchange. The tourist industry's knowledge sharing activities are accelerated by a supportive culture, the establishment of a quality system for KM, and the availability of a platform that allows workers to connect more easily. KME's (top management support, organizational culture, organization structure, and information technology) could be seen as a driving force in the process of the formation of KM systems to encourage knowledge sharing behavior inside organizations.

• **Future Directions and Limitations**

There are certain limitations to the present paper. Firstly, some of the other KM facilitators, such as individual KME's (knowledge management enablers), may have differing perspectives on the drivers of knowledge sharing, which were not incorporated in this paper. Second, the current paper looked at the link between KME's and knowledge sharing; any future research should build on this work to learn more about the effects of this association, for example, on the performance of employees, effectiveness, and competitive advantages. Finally,

the current study only looked at one component of KM, namely KS, while other parts of KM, like the creation and utilization of knowledge, can be studied in further research.

- **Conclusion**

The current research examined how knowledge management enablers (KMEs), and in particular top management support, organizational culture, structure, and information technology, influenced the knowledge sharing (KS) behavior of individuals. The study findings established that all the four KMEs are positively related to KS, reinforcing the role of these factors in knowledge sharing within the prescribed organizations. In particular, it was indicated that knowledge related culture was crucial in motivating employees to engage in high levels of cross-functional knowledge-sharing imitatively as earlier studies have indicated that trust and openness are fundamental to KM practices. Further, it was established that knowledge-sharing was enhanced by the existence of a more 'organic' organizational structure that allowed for the adoption of knowledge management activities. The study also emphasized the role played by the upper management in demonstrating the importance of knowledge and creating a climate that solicits employee cooperation in engaging in KS behavior. It was noted that increased engagement in knowledge sharing was linked to enhanced levels of creativity and taking on challenges by leaders. In addition, one more aspect that made the KM action successful was the information technology, which made knowledge available, merged it and propagated it all over the organization. In practical view, interesting conclusions are formulated for future HR and public policies, and particularly for the tourism.

Reference

- Abdelwhab Ali, A., Panneer selvam, D. D. D., Paris, L., & Gunasekaran, A. (2019)**, “Key factors influencing knowledge sharing practices and its relationship with organizational performance within the oil and gas industry”, *Journal of Knowledge Management*, Vol.23 No.9,pp. 1806-1837.
- Adeinat, I. M., & Abdulfatah, F. H. (2019)**, “Organizational culture and knowledge management processes: case study in a public university”, *VINE Journal of Information and Knowledge Management Systems*, Vol.49 No.1,pp. 35–53.
- Adhikari, D.R. (2010)**, “Knowledge management in academic institutions”, *International Journal of Educational Management*, Vol. 22 No.2, pp. 94-104.
- Ahmad, F., & Karim, M. (2019)**, “Impacts of knowledge sharing: A review and directions for future research”, *Journal of Workplace Learning*, Vol.31 No.3, pp. 207–230. <https://doi.org/10.1108/JWL-07-2018-0096>.
- Alavi, M., and Leidner, D., E. (2001)**, “Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues”, *MIS quarterly*, Vol. 25 No.1, pp.107-136.
- Alegre, J., Sengupta, K., and Lapiedra, R. (2013)**, “Knowledge management and innovation performance in a high-tech SMEs industry”, *International Small Business Journal*, Vol. 31 No.4, pp. 454 - 470.
- Al-Hakim, L. A. Y., and Hassan, S. (2013)**, “Knowledge management strategies, innovation, and organizational performance: An empirical study of the Iraqi MTS”, *Journal of Advances in Management Research*, Vol.10 No.1, pp. 58-71.
- Angels, D., Torben, P., Gooderham, P. N., Elter, F., & Hildrum, J. (2017)**, “The effect of organizational separation on individual knowledge sharing in MNC”, *Journal of World Business*, Vol. 52 No.3, pp. 431- 446.
- Arntzen, A.A.B., Worasinchai, L. and Ribière, V.M. (2009)**, “An insight into knowledge management practices at Bangkok University”, *Journal of Knowledge Management*, Vol. 13 No. 2,pp. 127-144.
- Asrar-Ul-Hag, M., Anwar, S., & Nisar, T. (2016)**, “A systematic review of knowledge management and knowledge sharing: Trends, issues, and challenges”, *Cogent Business & Management*, Vol. 3 No.1, pp. 1127744.
- Aureli, S., Giampaoli, D., Ciambotti, M. and Bontis, N. (2019)**, “Key factors that improve knowledge-intensive business processes which lead to competitive advantage”, *Business Process Management Journal*, Vol.25 No.1, pp. 126-143.
- Balle, A.R., Oliveira, M. and Curado, C.M.M. (2020)**, “Knowledge sharing and absorptive capacity: interdependency and complementarity”, *Journal of Knowledge Management*, Vol.24 No.8,pp. 1943-1964.
- Barclay, D., Higgins, C., & Thompson, R. (1995)**, “The partial least squares (PLS) approach to causal modeling: Personal computer adoption and use as an illustration”, *Technology Studies*, Vol. 2 No.2, pp. 285–309.
- Bhatti, S.H., Zakariya, R., Vrontis, D., Santoro, G. and Christofi, M. (2020)**, “High Performance work systems, innovation and knowledge sharing”, *Employee Relations: The International Journal*, Vol.43 No.2, pp.438-458.
- Bibi, P., Ahmad, A., & Majid, A. H. (2018)**, “HRM practices and employee retention: The moderating effect of work environment”, In *Applying partial least squares in tourism and hospitality research*, Emerald Publishing Limited.
- Black, W., & Babin, B. J. (2019)**, “Multivariate data analysis: Its approach, evolution, and impact”, In *The great facilitator: Reflections on the contributions of Joseph F. Hair, Jr. to marketing and business research* (pp. 121-130). Cham: Springer International Publishing.
- Bock, Z., Kim Y.G., Lee, K., Lee, J.N. & L. Zmud. (2005)**, “Behavioral Intention Formation in Knowledge Sharing: Examining the Roles of Extrinsic Motivators, Social-Psychological Forces, and Organizational Climate”, *MIS Quarterly*, Vol.29 No.1, pp. 87.
- Bose, R. (2004)**, “Knowledge management metrics”, *Industrial management & data systems*, Vol.104 No.6, pp. 457-468.
- Bouncken, R. (2002)**, “Knowledge management for quality improvements in hotels”, *Journal of Quality Assurance in Hospitality & Tourism*, Vol.3 No.3/4, pp. 25–59.

- Cabrera, E. F., and Cabrera, A. (2005)**, “Fostering knowledge sharing through people management practices”, *The International Journal of Human Resource Management*, Vol. 16 No.5, pp. 720-735.
- Chang, H. H., & Chuang, S. S. (2011)**, “Social capital and individual motivations on knowledge sharing: Participant involvement as a moderator”, *Information & management*, Vol.48 No.1, pp. 9-18.
- Chase, R. L. (1997)**, “The knowledge-based organization: an international survey”, *Journal of Knowledge Management*, Vol.1 No.1, pp. 38-49.
- Cheng, C. and Yang, M. (2019)**, “Creative process engagement and new product performance: the role of new product development speed and leadership encouragement of creativity”, *Journal of Business Research*, Vol.99, pp. 215-225.
- Chong, C. W., Holden, T., Wihelmij, P., & Schmidt, R. A. (2000)**, “Where does knowledge management add value”? *Journal of Intellectual Capital*, Vol.1 No.4, pp. 366–383.
- Dang, C. N., Le-Hoai, L., & Kim, S. Y. (2018)**, “Impact of knowledge enabling factors on organizational effectiveness in construction companies”, *Journal of Knowledge Management*, Vol.22 No.4, pp. 759-780.
- Davenport, T. H., & Prusak, L. (1998)**, “Working Knowledge”, Boston, USA: Harvard Business School Press.
- Deng, P., & Lu, H. (2022)**, “Transnational knowledge transfer or indigenous knowledge transfer: Which channel has more benefits for China’s high-tech enterprises”? *European Journal of Innovation Management*, Vol. 25 No.2, pp. 433–453.
- Donate, M.J. and de Pablo, J.D.S. (2015)**, “The role of knowledge-oriented leadership in knowledge management practices and innovation”, *Journal of Business Research*, Vol.68 No.2, pp.360-370.
- Drucker, P. F. (1993)**, “The rise of the knowledge society”, *The Wilson Quarterly*, Vol.17 No.2, pp. 52–72.
- Duarte, P., & Raposo, M. (2010)**, “A PLS model to study brand preference: An application to the mobile phone market” In V. Esposito Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of partial least squares* (pp. 449–485). Berlin, Heidelberg: Springer.
- Duru, C. C., Fu, C., & Nimo, M. (2023)**, “Influence of knowledge management enablers and processes on a sustainable manufacturing performance in Nigeria”, *European Journal of Sustainable Development Research*, Vol.7 No.3, pp. 0226.
- Eisenberger, R., Cummings, J., Aemeli, S., and Lynch, P. (1997)**, “Perceived organizational support, discretionary treatment, and job satisfaction”, *Journal of Applied Psychology*, Vol.82 No.5, pp.812-820.
- Eisenhardt, K. M., & Santos, F. M. (2002)**, “Knowledge-based view: A new Theory of strategy”? In A. Pettigrew, H. Thomas, & R. Whittington (Eds.), *Handbook of Strategy and Management* (pp. 139–164).
- Farooq, R., & Tripathi, N. (2024)**, “Moderating role of power distance in the relationship between leader-leader exchange (LLX) and knowledge sharing: is feedback-seeking behavior a missing link”? *VINE Journal of Information and Knowledge Management Systems*, Vol.54 No1, pp. 129-156.
- Fornell, C., & Larcker, D. F. (1981)**, “Evaluating structural equation models with unobservable variables and measurement error”, *Journal of Marketing Research*, Vol.18, pp. 39–50.
- Fullwood, R., Rowley, J. and Delbridge, R. (2013)**, “Knowledge sharing amongst academics in UK universities”, *Journal of Knowledge Management*, Vol.17 No.1, pp.123-136.
- Gardner, P. L., Verma, V. K., and Payne, B. (2006)**, “Balancing research vision and research management to achieve success in the 21st century”, *Technology Management for the Global Future*, Vol.1 No.2, pp. 99-108.
- Gefen, D., Straub, D., & Boudreau, M. C. (2000)**, “Structural equation modeling and regression: Guidelines for research practice”, *Communications of the Association for Information Systems*, Vol.4 No.1, pp. 1-76.
- Ghasemzadeh, P., Nazari, J. A., Farzaneh, M., & Mehralian, G. (2019), “Moderating role of innovation culture in the relationship between organizational learning and innovation performance”, *The Learning Organization*, Vol.26 No.3, pp. 289-303.
- Gil-Marques, M. and Moreno-Luzon, M.D. (2013)**, “Driving human resources towards quality and innovation in a highly competitive environment”, *International Journal of Manpower*, Vol.34 No.8, pp.839-860.
- Gold, A. H., Malhotra, A., & Segars, A. H. (2001)**, “Knowledge management: An organizational capabilities perspective”, *Journal of Management Information Systems*, Vol.18 No.1, pp.185–214.

- Grant, R. M. (1996)**, "Toward a knowledge-based theory of the firm", *Strategic management journal*, Vol.17 No.52, pp. 109-122.
- Grizelj, F. (2003)**, "Collaborative knowledge management in virtual service companies—approach for tourism destinations", *Tourism*, Vol.51 No.4, pp. 371–385.
- Gupta, A. K., & Govindarajan, V. (2000)**, "Knowledge flows within multinational corporations. *Strategic management journal*, Vol.21, No.4, pp. 473-496.
- Hair Jr, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014)**, "Partial least squares structural equation modeling (PLS-SEM)", *European Business Review*, Vol.26 No.2, pp. 106-121.
- Hair Jr., J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017)**, "PLS SEM or CB-SEM: updated guidelines on which method to use", *International Journal of Multivariate Data Analysis*, Vol.1 No.2, pp. 107.
- Hair, J. F, Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2018)**, "Advanced Issues in Partial Least Squares Structural Equation Modeling (2nd ed.)", Sage Publication.
- Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998)**, "Multivariate data analysis (5th ed.)", Englewood Cliffs, NJ: Prentice-Hall.
- Hair, J. F., William C. B., Barry J. B., & Rolph E. A. (2010)**, "Multivariate data analysis", Englewood Cliffs, NJ: Prentice-Hall.
- Hair, Joseph F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019)**, "When to use and how to report the results of PLS-SEM", *European Business Review*, Vol. 31 No.1, pp. 2–24.
- Hallin, C. A., & Marnburg, E. (2008)**, "Knowledge management in the hospitality industry: A review of empirical research", *Tourism management*, Vol.29 No.2, pp. 366-381.
- Hao, Q., Shi, Y. and Yang, W. (2019)**, "How leader-member exchange affects knowledge sharing behavior: understanding the effects of commitment and employee characteristics", *Frontiers in Psychology*, Vol.10, pp.1-13.
- Harrison, J. P., & Daly, M. A. (2009)**, "Leveraging health information technology to improve patient safety", *Public Administration & Management*, Vol.14 No.1, pp.218.
- Henseler, J., Dijkstra, T. K., Sarstedt, M., Ringle, C. M., Diamantopoulos, A., Straub, D. W., Ketchen, D. J., Hair, J. F., Hult, G. T. M., & Calantone, R. J. (2014)**, "Common Beliefs and Reality About PLS: Comments on Rönkkö and Evermann (2013)", *Organizational Research Methods*, Vol.17 No.2, pp. 182–209.
- Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009)**, "The use of partial least squares path modeling in international marketing", *Advances in international marketing*, Vol.20 No.1, pp.277- 319.
- Henseler, J., Ringle, C.M., & Sarstedt, M. (2015)**, "A new criterion for assessing discriminant validity in variance-based structural equation modelling", *Journal of the Academy of Marketing Science*, Vol.43 No.1, pp. 115–135.
- Hjalager, A. (2002)**, "Repairing innovation defectiveness in tourism", *Tourism Management*, Vol.23, pp. 465–474.
- Ho, C. F., Hsieh, P. H., & Hung, W. H. (2014)**, "Enablers and processes for effective knowledge management", *Industrial Management & Data Systems*, Vol.114 No.5, pp. 734 – 754.
- Ho, C. T. (2009)**, "The relationship between knowledge management enablers and performance", *Industrial Management & Data Systems*, Vol.109 No.1, pp. 98-117.
- Ho, L. A., Kuo, T. H., Lin, C., and Lin, B. (2010)**, "The mediate effect of trust on organizational online knowledge sharing: An empirical study", *International Journal of Information Technology & Decision Making*, Vol.9 No.4, pp. 625-644.
- Holsapple, C. W., & Joshi, K. D. (2004)**, "A knowledge management ontology". In Holsapple, C. (Ed.), *Handbook on Knowledge Management* (pp. 89-124). Berlin: Springer Science & Business Media.
- Holsapple, C. W., and Joshi, K. D. (2000)**, "An investigation of factors that influence the management of knowledge in organizations", *The Journal of Strategic Information Systems*, Vol.9 No.2, pp. 235-261.
- Ibarra-Cisneros, M. A., Reyna, J. B. V., & Hernández-Perlines, F. (2023)**, "Interaction between knowledge management, intellectual capital and innovation in higher education institutions", *Education and Information Technologies*, pp.1-24.

- Ibrahim, S., and Heng, L. H. (2015)**, “The Roles of Learning in Stimulating Knowledge Sharing at SMEs”, *Procedia-Social and Behavioral Sciences*, Vol. 172 (2015), pp.230-237.
- Iftikhar, Z., Eriksson, I. V., & Dickson, G. W. (2003)**, “Developing an instrument for knowledge management project evaluation”, *Electronic Journal of Knowledge Management*, Vol. 1 No.1, pp. 55-62.
- Islam, T., Ahmed, I., Usman, A., & Ali, M. (2021)**, “Abusive supervision and knowledge hiding: The moderating role of future orientation and Islamic work ethics”, *Management Research Review*, Vol.44 No.12, pp. 1565–1582.
- Jambekar, A. B., & Pelc, K. I. (2006)**, “A model of knowledge processes in a manufacturing company”, *Journal of Manufacturing Technology Management*, Vol.17 No.3, pp. 315-331.
- Jarvenpaa, S. L., and Ives, B. (1991)**, “Executive involvement and participation in the management of information technology”, *MIS quarterly*, Vol.15 No.1, pp. 205-227.
- Johnston, R., and Blumentritt, R. (1998)**, “Knowledge moves to center stage”, *Science Communication*, Vol.20 No.1, pp. 99-105.
- Kahle, E. (2002)**, “Implications of ‘new economy’ traits for the tourism industry”, *Journal of Quality Assurance in Hospitality & Tourism*, Vol.3 No.3/4, pp. 5–23.
- Kline, R. B. (2011)**, “*Principles and practice of structural equation modelling*”, New York, NY: Guilford Press.
- Kotler, P., Bowen, J., & Makens, J. (1999)**, “*Marketing for hospitality and tourism* (2nd ed.)”, Upper Saddle River, NJ: Prentice-Hall International.
- Krogh, V.G., Ichijo, K., and Nonaka, I. (2000)**, “*Enabling Knowledge Creation: How to Unlock the Mystery of Tacit Knowledge and Release the Power of Innovation*”, New York: Oxford University Press.
- Kumar, M., Mangain, P., Pasumarti, S. S., & Singh, P. K. (2024)**, “Organizational IT support and knowledge sharing behaviour affecting service innovation performance: empirical evidence from the hospitality industry”, *VINE Journal of Information and Knowledge Management Systems*, Vol.54 No.2, pp. 256-279.
- Lee, H., and Choi, B. (2003)**, “Knowledge management enablers, processes, and organizational performance: An integrative view and empirical examination”, *Journal of management information systems*, Vol.20 No.1, pp. 179-228.
- Lee, S., Gon Kim, B. and Kim, H. (2012)**, “An integrated view of knowledge management for performance”, *Journal of Knowledge Management*, Vol.16 No.2, pp. 183-203.
- Lee, Y., Tao, W., Li, J. Y. Q., & Sun, R. (2021)**, “Enhancing employees’ knowledge sharing through diversity-oriented leadership and strategic internal communication during the COVID-19 outbreak”, *Journal of Knowledge Management*, Vol.25 No.6, pp. 1526-1549.
- Leonardi, P. M. (2014)**, “Social media, knowledge sharing, and innovation: Toward a theory of communication visibility”, *Information systems research*, Vol.25 No. 4, pp. 796-816.
- Mehmood, M. S., Jian, Z., Akram, U., Akram, Z., & Tanveer, Y. (2022)**, “Entrepreneurial leadership and team creativity: The role of team psychological safety and knowledge sharing”, *Personnel Review*, Vol.51 No.9, pp. 2404–2425.
- Mitch Casselman, R., & Samson, D. (2007)**, “Aligning knowledge strategy and knowledge capabilities”, *Technology Analysis & Strategic Management*, Vol. 19 No.1, pp. 69-81.
- Mubarak, K., & Sabraz Nawaz, S. (2019)**, “Knowledge management strategic enablers in higher education institutions in Sri Lanka”, *International Journal of Grid and Distributed Computing*, Vol.12 No.3, pp. 190–198.
- Muhammad Yasir Abdul Majid. (2017)**, “Impact of knowledge management enablers on knowledge sharing: is trust a missing link in SMEs of emerging economies”? *World Journal of Entrepreneurship, Management and Sustainable Development*, Vol.13 No.1, pp. 16-33.
- Nakano, D., Muniz, J. and Dias Batista, E. (2013)**, “Engaging environments: tacit knowledge sharing on the shop floor”, *Journal of Knowledge Management*, Vol.17 No.2, pp.290-306.
- Nguyen, T. -M., Siri, N. S., & Malik, A. (2021)**, “Multilevel influences on individual knowledge sharing behaviours: The moderating effects of knowledge sharing opportunity and collectivism”, *Journal of Knowledge Management*, Vol.26 No.1, pp.70–87. <https://doi.org/10.1108/JKM-01-2021-0009>.

- Nisula, A. M., and Kianto, K. (2015)**, “The role of knowledge management practices in supporting employee capacity for improvisation”, *The International Journal of Human Resource Management*, Vol. 27 No.17, pp. 1920-1937.
- Nonaka, I., & Takeuchi, H. (1995)**, “*The knowledge-creating company: How Japanese companies create the dynamics of innovation*”, New York: Oxford University Press.
- O'dell, C., & Grayson, C. J. (1998)**, “If only we knew what we know: Identification and transfer of internal best practices”, *California management review*, Vol.40 No.3, pp. 154-174.
- ODIRI, V. I. O. (2022)**, “Information Communication Technology and Organizational Performance: Experience From Nigerian Manufacturing Subsector”, *Journal of Social and Management Sciences*, Vol.17 No.1.
- Ogunyomi, P. and Bruning, N., S. (2015)**, “Human resource management and organizational performance of small and medium enterprises (SMEs) in Nigeria” *The International Journal of Human Resource Management*, Vol.27 No.6, pp. 612-634.
- Palacios-Marques, D., Soto-Acosta, P., and Merigo, J. M. (2015)**, “Analyzing the effects of technological, organizational and competition factors on Web knowledge exchange in SMEs”, *Telematics and Informatics*, Vol.32 No.1, pp. 23-32.
- Pan, S. L., and Scarbrough, H. (1998)**, “A socio-technical view of knowledge sharing at Buckman Laboratories”, *Journal of Knowledge Management*, Vol. 2 No.1, pp. 55-66.
- Rafique, M., Hameed, S., & Agha, M. H. (2018)**, “Impact of knowledge sharing, learning adaptability and organizational commitment on absorptive capacity in pharmaceutical firms based in Pakistan”, *Journal of Knowledge Management*, Vol. 22 No.1, pp. 44-56.
- Ramachandran, S.D., Chong, S.-C. and Wong, K.-Y. (2013)**, “Knowledge management practices and enablers in public universities: a gap analysis”, *Campus-Wide Information Systems*, Vol. 30 No.2, pp. 76-94.
- Ringle, C. M., Sarstedt, M., & Straub, D. W. (2012)**, “A Critical Look at the Use of PLS-SEM in MIS Quarterly”, *MIS Quarterly*, Vol.36 No.1, pp. 1-21.
- Ringle, C., Wende, S., & Will, A. (2005)**, “Smart-PLS Version 2.0 M3”, University of Hamburg.
- Ruhanen, L., & Cooper, C. (2004)**, “Applying a knowledge management framework to tourism research”, *Tourism Recreation Research*, Vol.29 No.1, pp. 83-88.
- Sahibzada, U. F., Latif, K. F., & Xu, Y. (2022)**, “Symmetric and asymmetric modeling of knowledge management enablers to knowledge management processes and knowledge worker productivity in higher education institutes”, *Journal of Enterprise Information Management*, Vol.35 No.3, pp. 729-756.
- Sahibzada, U.F., Jianfeng, C., Latif, K.F., Shafait, Z. and Sahibzada, H.F. (2020a)**, “Interpreting the impact of knowledge management processes on organizational performance in Chinese higher education: mediating role of knowledge worker productivity”, *Studies in Higher Education*, pp.1-18.
- Sarstedt, M., Ringle, C. M., Smith, D., Reams, R., & Hair Jr, J. F. (2014), “Partial least squares structural equation modeling (PLS-SEM): A useful tool for family business researchers”, *Journal of family business strategy*, Vol.5 No.1, pp. 105-115.
- Schnellbacher, B., Heidenreich, S., & Wald, A. (2019)**, “Antecedents and effects of individual ambidexterity- A cross-level investigation of exploration and exploitation activities at the employee level”, *European Management Journal*, Vol. 37 No.4, pp. 442-454.
- Shan, P., Song, M. and Ju, X. (2016)**, “Entrepreneurial orientation and performance: is innovation speed a missing link”? *Journal of Business Research*, Vol.69 No.2, pp. 683-690.
- Sheldon, P. J. (1997)**, “The tourism information technology”, Wallingford, UK: CAB International.
- Singh, S.K., Gupta, S., Busso, D. and Kamboj, S. (2020)**, “Top management knowledge value, knowledge sharing practices, open innovation and organizational performance”, *Journal of Business Research*, Vol.128, pp.788-798.
- Skarlicki, D. P., and Latham, G. P. (1997)**, “Leadership training in organizational justice to increase citizenship behavior within a labor union: A replication”, *Personnel Psychology*, Vol.50 No.3, pp. 617-631.
- Stoddart, L. (2001)**, “Managing intranets to encourage knowledge sharing: opportunities and constraints”, *Online information review*, Vol. 25 No.1, pp. 19-29.

- Supapawawisit, B., Chandrachai, A. and Thawesaengskulthai, N. (2018)**, “The critical factors of research and innovation creation in public universities in Thailand”, *International Journal of Trade and Global Markets*, Vol.12 No.1-2, pp. 109-117.
- Syed-Ikhsan, S. O. S., & Rowland, F. (2004)**, “Knowledge management in a public organization: a study on the relationship between organizational elements and the performance of knowledge transfer”, *Journal of knowledge management*, Vol.8 No.2, pp. 95-111.
- Tan, C. N. L., and Md. Noor, S. (2013)**, “Knowledge management enablers, knowledge sharing and research collaboration: a study of knowledge management at research universities in Malaysia”, *Asian Journal of Technology Innovation*, Vol. 21 No.2, pp. 251-276.
- Teh, P. L., and Yong, C. C. (2011)**, “Knowledge sharing in IS personnel: Organizational behavior's perspective”, *Journal of Computer Information Systems*, Vol.51 No.4, pp. 11- 21.
- Teo, T. S. H., Srivastava, S. C., & Jiang, L. (2008)**, “Trust and electronic government success: An empirical study”, *Journal of Management Information Systems*, Vol. 25No.3, pp.99–132.
- Tian, J., Nakamori, Y. and Wierzbicki, A.P. (2009)**, “Knowledge management and knowledge creation in academia: a study based on surveys in a Japanese research university”, *Journal of Knowledge Management*, Vol.13No.2, pp. 76-92.
- Trieu, H. D., Van Nguyen, P., Nguyen, T. T., Vu, H. M., & Tran, K. (2023)**, “Information technology capabilities and organisational ambidexterity facilitating organisational resilience and firm performance of SMEs”, *Asia Pacific Management Review*, Vol. 28 No.4, pp 544-555.
- Usoro, A., Sharratt, M. W., Tsui, E., and Shekhar, S. (2007)**, “Trust as an antecedent to knowledge sharing in virtual communities of practice”, *Knowledge Management Research and Practice*, Vol.5, No.3, pp. 199-212.
- Wiig, K. M. (1997)**, “Knowledge management: Where did it come and where will it go”? *Expert Systems with Applications*, Vol. 13 No.1, pp. 1–14.
- Yeboah, A. (2023)**. Knowledge sharing in organization: A systematic review. *Cogent Business & Management*, 10(1), 2195027.
- Yeh, Y. J., Lai, S. Q., & Ho, C. T. (2006)**, “Knowledge management enablers: a case study”, *Industrial Management & Data Systems*, Vol. 106 No.6, pp.793-810.
- Yun, D. (2004)**, “Knowledge management in hospitality and tourism”, *Annals of Tourism Research*, Vol.31 No.4, pp. 1064–1065.
- Zacher, H., Robinson, A.J. and Rosing, K. (2016)**, “Ambidextrous leadership and employees' self-reported innovative performance: the role of exploration and exploitation behaviours”, *The Journal of Creative Behavior*, Vol. 50 No.1, pp.24-46.
- Zack, M. H. (1999)**, “Managing codified knowledge”, *Sloan management review*, Vol. 40 No.4, pp. 45-58.
- Zhang, X., & Jiang, J. Y. (2015)**, “With whom shall I share my knowledge? A recipient perspective of knowledge sharing”, *Journal of Knowledge Management*, Vol.19 No.2, pp. 277-295.
- Zia, N.U. (2020)**, “Knowledge-oriented leadership, knowledge management behaviour and innovation performance in project-based SMEs. The moderating role of goal orientations”, *Journal of Knowledge Management*, Vol.24 No.8, pp.1819-1839.

Exploring the Impact of Psychological Determinants and Financial Literacy on Retirement Planning in Tribal Communities with Reference to Bodoland Territorial Region, Assam.

Miss. Rosy Basumatary

Research Scholar,

Department of Management Studies,
Bodoland University, Kokrajhar, Assam,
India

Dr. Nayanjyoti Bhattacharjee

Assistant Professor,

Department of Management Studies,
Bodoland University, Kokrajhar Assam,
India

Abstract

Tribal communities are the indigenous peoples of the nation. They are very much connected to the land, yet they often face significant neglect in various aspects, such as economic backwardness, geographical isolation, limited access to financial services, and low literacy rate. Despite these issues, research on retirement planning within tribal communities is notably sparse within India. No specific research has been conducted to explore the determinants of retirement planning among the Bodo tribes living in Bodoland Territorial Region (BTR), Assam. This paper aims to address this gap and adds to the existing work on retirement planning. It thus explores the psychological determinants of retirement planning behaviour, such as financial risk tolerance, future time perspective, and retirement goal clarity within this community. It also examines how variations in financial literacy moderate the association between these psychological factors and the retirement planning behavior exhibited by working individuals of BTR. Using a sample of 382 working individuals, data were analyzed through PLS-SEM multigroup analysis in Smart PLS 4. The path analysis results indicated that financial risk tolerance, future time perspective, and retirement goal clarity have a direct positive impact on retirement planning behavior. The findings affirmed that financial literacy acts as a moderator in the association between psychological factors and retirement planning behaviour. Interestingly, the findings of multigroup analysis underscores that the effect of future time perspective on retirement planning behaviour is more pronounced among individuals with low financial literacy than among those with high financial literacy within this unique geographical region, which is unlike the studies conducted with urban or metropolitan populations. The findings of our study have implications for financial planners, policy makers and financial institutions.

Keywords: Financial Literacy, Retirement Planning Behaviour, Financial Risk Tolerance, Multigroup Analysis

Introduction

According to Max Life Insurance India Retirement Index Study 3.0 (July-August 2023), two out of five Indians have not even started to plan for retirement. India has witnessed increasing life expectancy from 62.28 years in 2000 to 70.42 years in 2023 and will also increase over the years (Source: United Nations- World Population Prospects). This trend accentuates the growing need of retirement income. McKenzie and Liersch (2011) also expressed that a rise in life expectancy combined with a greater requirement for retirement revenue resulting in a lack of adequate retirement funds represents a severe concern. Also, the paradigm shift from defined benefit to contribution-based pension plans has elevated responsibility among people for life cycle saving. This is in context of India as a whole, based on the surveys and studies conducted in urban and metropolitan populations. However, the situation is somewhat different for the marginalized sections of the society, particularly among scheduled tribes.

Tribal communities, as indigenous peoples, often face substantial challenges in various aspects, such as economic backwardness, geographical isolation, limited access to financial services, and low literacy rate. Research conducted in tribal areas has revealed that indigenous populations tend to have low literacy rates (Dutta and Sarkar, 2019; Singh and Singh, 2023). A study by Sadhu (2022) revealed that the saving and investment behaviour of the tribal people living in Deoghar district of Jharkhand state is very low even if they are financially included. Also, in a study conducted by Nayak (2013) found that majority of the rural households of western Odisha have low educational levels, leading to limited awareness of the benefits of saving.

Despite these significant issues, no specific research has been conducted to explore the determinants of retirement planning among the scheduled tribes living in Bodoland Territorial Region, Assam. This concern motivates the focus of the present study to explore the extant retirement picture among the Bodo tribes living in BTR to better comprehend the variables driving the retirement planning behaviour among working people of this region and derive implications for developing effective strategies and pension policy improvements.

Majority of the studies on retirement planning behaviour has concentrated on demographic parameters comprising gender, age, income, education level, and marital status (Hershey, 2004; Joo and Pauwels, 2002; Moorthy et al., 2012;). However, the psychological and cognitive factors are often overlooked despite their significant impact. Hershey (2004) claimed that demographic variables are the distal influences that are mediated by psychological factors. Whereas psychological factors are the proximate effects having a direct impact on retirement planning practices. This study, therefore, focuses on key psychological constructs such as future time perspective, financial risk tolerance, and goal clarity, which are prominent in the existing literature on retirement planning.

With the increase in individual's responsibility for managing their retirement finances, it has now become essential for an individual to be financially literate. Also, with the swift growth of financial markets with myriads of complex financial products, the study of financial literacy has become increasingly important to make informed decisions. Previous research has explored the cognitive effect of financial literacy on retirement planning (Hauff et al., 2020; Lusardi and Mitchell, 2006). However, fewer studies have investigated its interplay with psychological variables affecting retirement planning practices. Hence our study intends to investigate the relationship between psychological factors, financial literacy, along with retirement planning behavior.

This study thus has the following objectives:

- To examine the direct impact of psychological factors such as financial risk tolerance, future time perspective, and retirement goal clarity on the retirement planning behavior.
- To explore the moderating effect of financial literacy- categorized as high and low- on the relationship between psychological factors and retirement planning behavior.

To address these objectives, we thus analyse the responses of 382 respondents to study retirement planning behaviours of working individuals of Bodoland Territorial Region, Assam by employing structural equation modeling with partial least square (PLS-SEM) and multigroup analysis.

This research makes a significant contribution to the literature by examining retirement planning behavior in the Bodoland Territorial Region (BTR), a Sixth Schedule area with distinct socio-economic conditions. The study considers the unique economic landscape, access to financial services, and attitudes towards retirement among a large scheduled tribe population in this region. Scheduled Tribe communities face socio-economic disparities, and retirement financial planning can be affected by factors like having accessibility to education, employment opportunities, and economic resources. Studying this population helps identify and address these disparities, fostering more equitable retirement outcomes.

Research that primarily focuses on urban or metropolitan populations may overlook the experiences and needs of those living in other areas of the country. By focusing on BTR, we seek to contribute to a more inclusive understanding of retirement planning behavior that accounts for the unique socio-economic dynamics and cultural nuances of this region. The study attempts to provide to a more inclusive understanding about retirement planning in India, potentially shedding light on psychological antecedents and cognitive factors. This approach will help guide targeted interventions to meet the specific retirement planning needs of individuals in BTR, thereby promoting inclusive growth and a robust social security net at the grassroots level.

Furthermore, aligning with the "Viksit Bharat" vision of inclusive and sustainable development, this research underscores the importance of addressing regional disparities in retirement planning. By highlighting the unique challenges faced by tribal communities, this study supports broader national objectives of equitable development and social welfare, contributing to a more comprehensive and inclusive growth strategy for India.

The remaining part of the paper is organized as follows: Section 2 provides the research framework and hypotheses development. Section 3 lays down the research methodology. Section 4 addresses the discussion of results, followed by the study's conclusion.

Research Framework and Hypotheses Development

Relevant Theories

Theory of Planned Behaviour

This theory builds upon Ajzen (1991) theory of reasoned behaviour. According to this theory, three key factors influence an individual's intention to engage in specific behaviours, such as planning and saving for retirement. These factors are: (1) Attitude towards the behavior, which encompasses elements like future orientation, goal clarity, and risk tolerance; (2) Subjective norms, reflecting social pressures and expectations; and (3) Perceived

behavioural control, which is influenced by financial literacy. Together, these components shape the intention to plan for retirement.

Mowen's 3M Theory of Motivation

This theory of motivation and personality was developed by Mowen (2000). It provides a comprehensive framework for understanding individual's behaviour by establishing systematic relationship between personality traits, motivation, and behaviour. The hierarchical structure of this theory include: elemental traits (basic personality characteristics), compound traits (such as future time perspective), situational traits (like financial risk tolerance) and surface traits (including retirement goal clarity). These traits collectively contribute to the desired behavior, in this case, effective retirement planning.

The Conceptual Model:

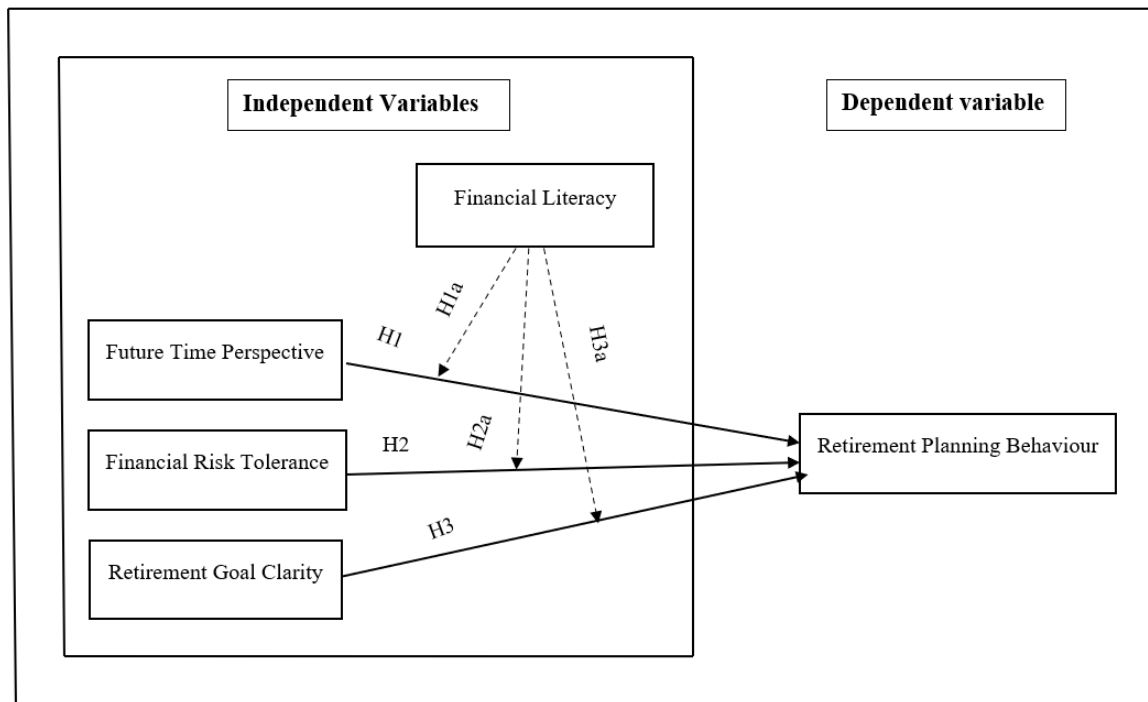


Figure 1. The conceptual model of the study

Source: The authors.

Figure 1 presents the conceptual model for this study. The model identifies psychological factors—namely, future time perspective, risk tolerance, and retirement goal clarity—as independent variables. Financial literacy is considered a moderator variable, while retirement planning behaviour serves as the dependent variable. The model examines the direct effects of the psychological factors on retirement planning behaviour. It also investigates how financial literacy influences these relationships, differentiating between groups with high and low levels of financial literacy.

Association between future time perspective and retirement planning

Future orientation or future time perspective measures the level as to which an individual prioritizes the future over the present or past (Howlett *et al.*, 2008). In the financial planning literature, future orientation stands out as a psychological factor that is widely discussed and examined concerning retirement planning. The study conducted by Jacobs-Lawson and Hershey in 2005 found that people who score high on a future time perspective index are more inclined towards setting their goals and hence more into retirement planning. Kimiyagahlam, Safari and Mansori (2019) study results also found that the future time perspective exhibits a positive correlation with regard to retirement planning mediated by savings attitude. Tomar *et al.*, (2021) also concluded that high future-oriented individuals are likely to be more aggressive for retirement planning and savings.

Hypothesis 1 (H1): There is a positive correlation between future time perspective and retirement planning behaviour.

Association between financial risk tolerance and retirement planning

The majority of earlier studies have utilized the perspective of risk tolerance in overall financial investment preferences. However, this study investigated risk tolerance as an individual's personal propensity for risk. There are not many numbers of studies that have investigated at how risk tolerance affects retirement savings and planning. Risk tolerance has been found to be a key forerunner of retirement investment and saving choices as reported by Grable and Joo (1997). Jacob and Hershey (2005) explored how future orientation and risk tolerance affects retirement savings behaviour and results indicated that people with high levels of financial risk tolerance are connected with greater degree of savings profile.

H2: There is a positive correlation between financial risk tolerance and retirement planning behaviour.

Association between retirement goal clarity and retirement planning

Goal clarity is a major predictor of planning behaviour, and planning, in turn, is found to anticipate savings tendency (Stawski, Hershey and Jacobs-Lawson, 2007). Various psychological research in literature have demonstrated that setting a specific, well-defined goal is very much essential because it motivates people to take part in planning activities thereby increasing their contributions to savings (Hershey, Henkens and Van Dalen, 2010). In addition, (Tomar *et al.*, 2021) argued that retirement planning behaviour is positively associated to retirement goal clarity.

H3: There is a positive correlation between retirement goal clarity and retirement planning behaviour.

Association between financial literacy and retirement planning

Financial literacy is generally a person's ability to apply knowledge and skills to handle financial resources effectively throughout an entire lifetime in the context of financial well-being (Hung *et al.*, 2011). Several studies in the literature have demonstrated a robust connection among financial literacy and a range of financial behaviour regarding savings, wealth accumulation, and portfolio selection (Hauff *et al.*, 2020; Lusardi and Mitchell, 2006). Lusardi and Mitchell (2011) also identified financial literacy as an important factor affecting retirement planning as it impacts a person's ability to comprehend interest rates, risk and inflation. Tomar *et al.* (2021) in their study found that retirement planning behaviour among professional women is moderated by financial literacy in connection with future time perspective and goal clarity. Research conducted by Kimiyagahlam, Safari and Mansori (2019) also demonstrated that financial literacy, future orientation, and tendency to plan are positively and directly related to retirement planning which is mediated by savings attitude.

H1a: Financial literacy moderates the association between future time perspective and retirement planning behaviour.

H2a: Financial literacy moderates the association between financial risk tolerance and retirement planning behaviour.

H3a: Financial literacy moderates the association between retirement goal clarity and retirement planning behaviour.

Research Methodology

Data Collection

This research employs a quantitative research methodology, utilizing primary data collected through a survey method that combines personal interviews and mailed questionnaires. The target population comprises working individuals aged 18 and above in the Bodoland Territorial Region. The study specifically concentrated on the Kokrajhar district, selected for its role as the administrative headquarters of the Bodoland Territorial Region (BTR). This designation renders Kokrajhar a representative centre for individuals from all four districts within the region, thereby providing a comprehensive sample for analysis.

A total of 382 working individuals from Kokrajhar were surveyed. To determine the required sample size, we used G*Power analysis software and input an effect size of 0.05 (f square), an α error probability of 0.05, and a power of 0.85 with five predictors. This analysis indicated that a minimum sample size of 146 respondents was needed. Given that our study involved multigroup analysis with two subgroups (high financial literacy and low financial literacy), we ensured that each subgroup comprised at least 146 respondents, validating the adequacy of the sample size.

We employed stratified purposive sampling to target two distinct groups: employed individuals (including those in private, government, and public sectors) and self-employed individuals (namely businesspersons, professionals, and gig workers) within Kokrajhar. This approach is significant because it ensures the inclusion of participants who possess specific characteristics pertinent to our study, allowing for a nuanced analysis of retirement planning behaviours across diverse occupational categories.

Measures

The dependent variable of the study retirement planning behavior was measured with a five-item scale adapted from the retirement planning scale designed by Moorthy et al. (2012). A Likert scale with five-point pattern from strongly disagree to strongly agree was used by respondents to answer all the items. Two items RPB4 and RPB5 were removed from the study as their outer loadings were below 0.50 and had poor AVE. Removing these two items improved AVE, Cronbach's alpha value, and Composite reliability of the construct. Future time perspective was assessed using a three-scale item adapted from Tomar et al. (2021) measured on a 7-point Likert scale ranging from 1 as strongly disagree to 7 as strongly agree. For the financial risk tolerance variable, we adapted a three-item scale from the risk tolerance scale developed by Tomar, Baker, Kumar and Hoffman (2021) and Jacobs-Lawson and Hershey (2005) also measured on a Likert scale with 7 points. Retirement goal clarity construct was measured using a five-item scale developed by Tomar et al. (2021) and responses were recorded on a 7-point Likert scale. Financial literacy was measured using five multiple-choice questions adapted from Lusardi and Mitchell (2017). These questions address basic financial principles such as compound interest, inflation, money illusion, and time value of money. Each question had a 'Don't know' option to discourage participants from guessing. The respondents got a score of 1 for each correct answer. An individual scoring above 60 percent indicates high financial literacy, while below 60 percent indicates low financial literacy (Chen and Volpe, 1998).

Discussion of Results

Descriptive Statistics

Table 1 provides a snapshot of the respondent's demographic profile. The majority fall within the age category of 18 to 29 years. Notably, 63.1 percent of those surveyed are male. In terms of income distribution, 56.8 percent earn up to Rs 2,50,000 annually, while 8.9 percent have an income exceeding Rs 10,00,000 per year. Educational statistics reveal that 39.5 percent of respondents are graduates. Occupation-wise, 51.8 percent are employed in various sectors, while 48.2 percent are self-employed.

Table 1. Demographic profile of respondents

Variables	Categories	Frequency	Percentage (%)
Age	18 to 29 years	152	39.8
	30 to 39 years	118	30.9
	40 to 49 years	63	16.5
	50 to 59 years	42	11.0
	60 years and above	7	1.8
Gender	Male	241	63.1
	Female	141	36.9
Annual income	Up to Rs 2,50,000	217	56.8
	Rs 2,50,001 to Rs 5,00,000	81	21.2
	Rs 5,00,001 to Rs 10,00,000	50	13.1
	Above Rs 10,00,000	34	8.9
Education	Up to Matriculation	32	8.4
	Higher Secondary/Diploma	70	18.3
	Graduate	151	39.5
	Post-graduate	117	30.6
	Above post-graduate	12	3.1
Type of employment	Employed	198	51.8
	Self-employed	184	48.2

Source: The authors.

Evaluation of the measurement model

Table 2 displays the reliability and validity assessment outcomes of the complete sample, and the two subgroups.

Table 2. Construct reliability & convergent validity outcomes of the measurement model evaluation.

Items	Factor loadings			Cronbach's alpha (α)			CR			AVE		
	Complete sample	High FL	Low FL	Complete sample	High FL	Low FL	Complete sample	High FL	Low FL	Complete sample	High FL	Low FL
FTP1	0.843	0.828	0.874	0.777	0.715	0.815	0.870	0.840	0.889	0.691	0.637	0.728
FTP2	0.851	0.796	0.883									
FTP3	0.798	0.769	0.800									
FRT1	0.890	0.903	0.871	0.810	0.829	0.780	0.887	0.897	0.872	0.724	0.744	0.694
FRT2	0.844	0.846	0.829									
FRT3	0.817	0.838	0.798									
RGC1	0.790	0.771	0.816	0.872	0.872	0.871	0.908	0.909	0.908	0.667	0.670	0.666
RGC2	0.866	0.882	0.844									
RGC3	0.879	0.877	0.882									
RGC4	0.872	0.890	0.852									
RGC5	0.656	0.645	0.669									
RPB1	0.745	0.751	0.761	0.759	0.747	0.763	0.863	0.856	0.865	0.678	0.667	0.683
RPB2	0.909	0.832	0.934									
RPB3	0.808	0.809	0.773									

Source: The authors.

Note: CR: Composite reliability, AVE: Average variance extracted, FTP: Future time perspective, FRT: Financial risk tolerance, RGC: Retirement goal clarity, RPB: Retirement planning behaviour, FL: Financial literacy.

All items in the constructs for the complete sample, high FL subgroups, and low FL subgroups are found to be above 0.5. The loadings between the range of 0.4 and 0.7 will be considered acceptable if composite reliability and AVE values crosses the threshold (Hair *et al.*, 2017). All the constructs in Table 2 have Cronbach's alpha value above 0.7 i.e., the threshold. From Table 2 it is also evident that the composite reliability values for all the constructs are above 0.7. Hence, the study indicated acceptable reliability and good internal consistency. Convergent validity is confirmed by the average variance extracted (AVE). The AVE's recommended threshold value for acceptability should be above 0.5 (Hair *et al.*, 2017). The AVE values in Table 2 for all the dimensions in the complete sample, low FL, and high FL subgroups are found to be above 0.5 which corroborates the study's convergent validity.

The heterotrait-monotrait (HTMT) ratio is used to evaluate the discriminant validity which is supported by HTMT values less than 0.9 (Hair *et al.*, 2017). Table 3 indicates that the HTMT values are less than 0.9 for all three cases and hence the result satisfies the HTMT criterion

Dataset	Constructs	FRT	FTP	RGC	RPB
Complete (N=504)	FRT				
	FTP	0.213			
	RGC	0.709	0.422		
	RPB	0.614	0.500	0.860	
High Financial Literacy (n=264)	FRT				
	FTP	0.201			
	RGC	0.644	0.377		
	RPB	0.583	0.357	0.804	
Low Financial Literacy (n=240)	FRT				
	FTP	0.325			
	RGC	0.824	0.483		
	RPB	0.755	0.578	0.899	

Source: The authors.

Note: The above table represents the HTMT (heterotrait-monotrait ratio) evaluation of the measurement model.

Structural model assessment

In evaluating a structural model, the initial step involves gauging multicollinearity through VIF (Variance Inflation Factor). We have followed the full collinearity process and observed that the values of VIF in all three instances are below the estimated limit ($VIF < 3$) indicating no multicollinearity issue according to Hair, Risher, Sarstedt and Ringle (2019).

The analysis of structural model begins with the assessment of co-efficient of determination (R^2) which measures the degree of variance explained in the dependent construct by structural model of the study (Hair *et al.*, 2017). Henseler *et al.* (2009) recommends the R^2 value of 0.67 as substantial, 0.33 as moderate, and 0.19 as weak. The R^2 values for the dependent construct ranged between 0.44 to 0.63 across all three samples (Complete, High FL, and Low FL) which is able to explain the study's moderate variance in the endogenous variable.

The effect size measures the level of impact exerted by the exogenous constructs on the dependent variable which is computed by Cohen's function f^2 . Cohen (1988) suggests the value of f^2 with 0.35 as strong, 0.15 as moderate, and 0.02 as weak effects. In the low FL subgroup, the sway of future orientation is found to be weak ($f^2=0.06$), goal clarity is found to exhibit a strong effect ($f^2=0.51$) and financial risk tolerance is also found to exhibit a weak effect ($f^2=0.02$) on retirement planning. On the other hand, results for the high FL individuals indicated that the sway of retirement goal clarity had a moderate effect size ($f^2=0.34$), risk tolerance had a weak effect ($f^2=0.01$), while future time perspective had a non-significant effect size on retirement planning.

To conclude the analysis of structural model for high and low FL subgroups, we tested the model's predictive power using the Q^2 value (Hair, Risher, Sarstedt and Ringle, 2019). The values of Q^2 for the endogenous constructs in both models are above zero, hence confirming predictive relevance.

The values of structural path coefficients for both the original sample and subsamples are provided in Table 4 where the proposed hypotheses are tested.

	Complete				High Financial Literacy				Low Financial Literacy			
Path/Hypothesis	β	t	P value	Results	B	t	P value	Results	β	t	P value	Results
H1: FTP→RPB	0.17	3.902	0.000	Supported*	0.078	1.255	0.210	Not supported	0.170	3.14	0.002	Supported*
H2: FRT→RPB	0.12	2.486	0.013	Supported*	0.156	2.392	0.017	Supported*	0.120	1.71	0.087	Supported*
H3: RGC→RPB	0.57	11.56	0.000	Supported*	0.540	7.183	0.000	Supported*	0.627	9.51	0.000	Supported*

Table 4. Path analysis Results

Source: The authors.

Note: FTP: Future time perspective, FRT: Financial risk tolerance, RGC: Retirement goal clarity, RPB: Retirement planning behaviour, FL: Financial literacy, * $p < 0.05$, ** $p < 0.1$

In the full sample analysis, all the hypotheses were supported as reported in the table 4. Future time perspective is found to exhibit substantial positive influence upon retirement planning behaviour of working individuals i.e., individuals with more future orientation have higher inclination to plan for their life after retirement. Hence, H1 is supported ($\beta=0.17$ and $p < 0.05$) which aligns with the study findings (Jacob and Hershey, 2005; Kimiyagahlam, Safari and Mansori, 2019). Financial risk tolerance is also found to be significantly affecting retirement planning suggesting that risk-tolerant working individuals are more prone to invest for their retirement. Thus, H2 is also supported ($\beta=0.12$ and $p=0.013$ i.e., $p < 0.05$). This result is in line with the findings of (Grable and Joo, 1997; Jacobs-Lawson and Hershey, 2005). Goal clarity also have a positive direct effect on retirement planning behaviour indicating that working individuals with clear and well-defined goals are more likely to take up planning activities to boost their contributions towards savings for retirement. Therefore, H3 is also supported ($\beta=0.57$ and $p < 0.05$) which is similar with the previous study (Hershey, Henkens and Van Dalen, 2010; Tomar, Baker, Kumar and Hoffman, 2021).

In terms of high FL subgroup, the impact of future orientation is revealed to be a non-significant predictor variable of retirement planning. Thus, H1 is not supported ($\beta=0.078$ and $p>0.05$) which contrasts the findings of Hershey and Mowen (2000) and Tomar *et al.* (2021). Risk tolerance is found to have a significant impact upon retirement planning which is in contrast with Tomar *et al.* (2021) and therefore, H2 is accepted ($\beta=0.156$ and $p>0.05$). And the strongest path in high FL subgroup is among retirement planning behaviour and retirement goal clarity ($\beta=0.540$ and $p<0.05$) which is in accordance with the results of Tomar *et al.*, 2021 and thus H3 is supported. This reveals that individual having a high degree of financial literacy are adept at setting realistic financial goals and engaging in comprehensive financial readiness for retirement.

In terms of low FL subgroup, all paths were revealed to be significant i.e., all psychological variables are identified to be significant positive predictors of retirement planning behaviour with goal clarity having the strongest significant path coefficient concerning retirement planning ($\beta=0.627$ and $p<0.05$) and risk tolerance having the weakest path on retirement planning ($\beta=0.120$ and $p<0.05$) as depicted in Table 4. This indicates that despite limited financial literacy, individuals with future-oriented mindset, try to gain financial knowledge as well as seek out information with a view to better plan their long-term financial retirement goals. Similarly, individuals with higher financial risk tolerance, despite low financial literacy, are more into retirement planning, indicating willingness to take risks to secure their future, as shown by the study results. Our study results also found that goal clarity has a substantial impact upon retirement planning among working individuals with low FL, which corroborates the study results of Tomar *et al.* (2021).

Multigroup analysis (MGA)

Multigroup analysis is performed to assess the moderation effect of financial literacy delineated as high and low FL subgroups on the studied relationships and test hypotheses. Henseler *et al.* (2016) argue that prior to performing MGA, it is essential to conduct MICOM (Measurement Invariance of Composite Models) to confirm that the variations between the two groups are caused by the difference in the latent variables and not by any other issues. We employed a two-stage process MICOM. Firstly, the assessment of configural invariance is done to confirm that the measurement model considered for the study for both the subgroups has the same configuration which means that the same indicators are used for both models, identical data treatment has been done, and identical algorithm settings for both the subgroups. Second, compositional invariance is evaluated as demonstrated in Table 5. Table 5 reveals that all constructs have permutation p-value exceeding 0.05, indicating insignificance. This confirms that the compositional variance is achieved.

Table 5. MICOM Compositional Variance

	Original correlation	Correlation permutation	5.00%	Permutation p-value
FRT	1.000	0.999	0.996	0.704
FTP	0.998	0.996	0.987	0.604
RGC	1.000	0.999	0.998	0.599
RPB	0.999	0.999	0.997	0.340

Source: The authors.

We now proceed to assess the differences between high FL and low FL subgroups using PLS-MGA (Multigroup analysis). The outcome of the multigroup analysis is illustrated in Table 6. Here in the concluding part of the study, we look at the notable difference between high FL and low FL in connection

Table 6. Multi-group analysis result

Relationships	Difference (High Financial Literacy-Low Financial Literacy)	p-value (High Financial Literacy-Low Financial Literacy)
H1a: FTP→RPB	-0.415	0.008*
H2a: FRT→RPB	0.004	0.943
H3a: RGC→RPB	0.153	0.316

Source: The authors.

Note: * $p < 0.05$

with financial risk tolerance, future time perspective, and retirement goal clarity on the retirement planning behaviour. The study outcomes highlighted that the differences in p-value are only significant and negative for H1a i.e., the effect of future time perspective on retirement planning behaviour is stronger in working individuals with low financial literacy in comparison to working individuals with high financial literacy by 0.415 in Bodoland Territorial Region, Assam. This result contrasts with the findings of Tomar *et al.* (2021), who found that for individuals with high financial literacy, the effect of future orientation on attitude towards retirement is stronger. Hence our data supports H1a only. This indicated that retirement planning behaviour of working individuals with limited financial knowledge are more prone to be driven by their future orientation which indicates that having a greater degree of forward-looking orientation tries to reduce financial literacy gaps by acquiring financial knowledge and seeking out information with a view to better plan their long-term financial retirement goals. The hypotheses H2a and H3a considered for the study cannot be supported by the results obtained in our study. Overall, the study contributes significant understanding into the complex dynamics between financial literacy, psychological factors, and retirement planning behavior, particularly in the context of the Bodoland Territorial Region, Assam.

Conclusion and Recommendations

The research underscores the considerable influence that risk tolerance, future time perspective, and retirement goal clarity have on retirement planning behavior. It is evident that individuals who exhibit a future-oriented mindset are more inclined to engage in planning for retirement, emphasizing the relevance of clarity in both short-term and long-term goals. Moreover, the study highlights the positive impact of financial risk tolerance upon retirement planning, particularly among risk-tolerant individuals who tend to be more disposed to make investment for their retirement. Furthermore, the impact of goal clarity emerges as an important precursor of retirement planning behavior, with individuals having distinct and well-defined goals demonstrating a greater propensity to indulge in financial planning endeavors and enhance their savings for later stages of life.

The study also delves into how financial literacy regulates the association between psychological factors and retirement planning behavior. It suggests that individuals with high financial literacy might not rely on future orientation for retirement planning. However, goal clarity and risk tolerance were significant predictors, indicating that individuals with high financial literacy are good at setting clear financial goals and comfortable taking risk for their retirement. For individuals with lower financial literacy, if they are future oriented and willing to take risks, they are motivated to plan for their retirement indicating that they make effort to gain financial knowledge and set realistic goals, despite their lower financial understanding.

Interestingly, the multigroup analysis emphasizes the role of future time perspective on retirement planning behavior is more noticeable among working individuals with low financial literacy among tribals living in BTR. This underscores the relevance of a forward-looking mindset in addressing gaps in financial literacy and improving planning strategies.

Overall, this study contributes valuable insights into the intricate dynamics between financial literacy, psychological factors, and retirement planning behaviour, offering practical implications for policymakers, financial facilitators, and individuals seeking to enhance their financial readiness for retirement. Given the study's insights, a few recommendations are proposed to enhance retirement planning among tribal communities, particularly in the Bodoland Territorial Region. First, Initiatives should be established to improve financial literacy within tribal communities. Tailored educational programs focusing on basic financial concepts, retirement planning strategies, and risk management can empower individuals to make informed financial decisions. Workshops and seminars can be conducted in local languages to ensure accessibility and comprehension. Policymakers should recognize the disparities in financial literacy levels within the Bodoland Territorial Region and focus on providing targeted tools and assistance to promote inclusive retirement planning preparedness. This includes policies that improve access to education and financial resources for marginalized

communities, ensuring that support reaches those who need it most. Tribal communities often face economic challenges, such as limited access to financial services, lower income levels, and higher rates of economic instability. Financial institutions can create retirement plans that fit these realities by offering flexible contribution options. For example, allowing individuals to adjust their savings based on changing income or financial obligations enables them to participate in retirement savings without the stress of rigid payment schedules. Setting up community-based financial counseling services can provide personalized support to those individuals looking to enhance their retirement planning efforts. Financial planners should offer guidance tailored to the specific needs of people in tribal areas, creating a supportive environment that promotes financial growth. This community-oriented approach can boost confidence in making sound financial choices. Ongoing research should be encouraged to further explore retirement planning determinants in tribal communities. Establishing a framework for monitoring and evaluating the impact of financial literacy programs and retirement planning initiatives will be crucial for refining strategies and ensuring they meet community needs effectively. The recommendations provided aims to empower individuals within tribal communities, improving their financial readiness for retirement, while also informing policy makers and financial institutions about the unique challenges faced by these populations. By leveraging these insights, stakeholders can create a more inclusive financial landscape that fosters better retirement outcomes for all. This proactive approach will not only enhance individual's financial security but also contribute to the broader economic well-being of tribal communities, ultimately leading to a more equitable society.

Limitations

The study is subject to limitations that warrant acknowledgment. The analysis of psychological variables and their impact on planning behavior is limited to low and high financial literacy subsamples. Future studies could explore variations based on gender, employment status, or other relevant distinctions. Finally, the sample in the specific geographic context employed for the study may constrain the generalizability of the results.

References

- Chen, H. and Volpe, R. P. (1998)**, “An analysis of financial literacy among college students”, *Financial Services Review*, 7(1), pp.107–128. [https://doi.org/10.1016/s1057-0810\(99\)80006-7](https://doi.org/10.1016/s1057-0810(99)80006-7)
- Cohen, J. (1988)**, *Statistical power analysis for the behavioural sciences*, Hillside. NJ: Lawrence Earlbaum Associates.
- Dutta, D. and Sarkar, A. Kr. (2019)**, “Relevance of Implementation of Financial Inclusion Among Tribal Groups of Jharkhand: A Study on Paharia Tribe”, *Think India Journal*, 22(14), pp.2135–2149.
- Grable, J. E. and Joo, S. H. (1997)**, “Determinants of risk preference: Implications for family and consumer science professionals”, *Family Economics and Resource Management Biennial*, Vol. 2 No. 1, pp.19–24.
- Hair Jr., J.F., Matthews, L. M., Matthews, R. L. and Sarstedt, M. (2017)**, “PLS-SEM or CB-SEM: Updated guidelines on which method to use”, *International Journal of Multivariate Data Analysis*, 1(2), pp.107–123. <https://doi.org/10.1504/IJMDA.2017.087624>.
- Hair, J. F., Risher, J. J., Sarstedt, M. and Ringle, C. M. (2019)**, “When to use and how to report the results of PLS-SEM”, *European Business Review*, 31(1), pp.2-24.
- Hauff, J. C., Carlander, A., Gärling, T. and Nicolini, G. (2020)**, “Retirement Financial Behaviour: How Important Is Being Financially Literate?”, *Journal of Consumer Policy*, 43(3), pp.543–564. <https://doi.org/10.1007/s10603-019-09444-x>
- Henseler, J., Ringle, C. M. and Sinkovics, R. R. (2009)**, “The use of partial least squares path modeling in international marketing”, *Advances in International Marketing*, Vol. 20, pp.277–319. [https://doi.org/10.1108/S1474-7979\(2009\)0000020014](https://doi.org/10.1108/S1474-7979(2009)0000020014)
- Henseler, J., Ringle, C. M. and Sarstedt, M. (2016)**, “Testing measurement invariance of composites using partial least squares”, *International Marketing Review*, 33(3), pp.405–431. <https://doi.org/10.1108/IMR-09-2014-0304>
- Hershey, D. A. and Mowen, J. C. (2000)**, “Psychological determinants of financial preparedness for retirement”, *Gerontologist*, 40(6), pp.687–697. <https://doi.org/10.1093/geront/40.6.687>
- Hershey, D. A. (2004)**, “Psychological influences on the retirement investor”, *CSA: Certified Senior Advisor*, 22, pp.31–39.
- Hershey, D.A., Henkens, K. and Van Dalen, H.P. (2010)**, “Aging and financial planning for retirement: Interdisciplinary influences viewed through a cross-cultural lens”, *The International Journal of Aging and Human Development*, 70(1), pp.1–38. <https://doi.org/10.2190/AG.70.1.a>
- Howlett, E., Kees, J. and Kemp, E. (2008)**, “The role of self-regulation, future orientation, and financial knowledge in long-term financial decisions”, *Journal of Consumer Affairs*, 42(2), pp.223–242. <https://doi.org/10.1111/j.1745-6606.2008.00106.x>
- Hung, A., Parker, A. M. and Yoong, J. (2011)**, “Defining and Measuring Financial Literacy”, *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.1498674>
- Jacobs-Lawson, J. M. and Hershey, D.A. (2005)**, “Influence of future time perspective, financial knowledge, and financial risk tolerance on retirement saving behaviors”, *Financial Services Review*, 14(4), pp.331–344. <https://doi.org/10.1111/j.1468-0297.2012.02501.x>
- Joo, S. H. and Pauwels, V. W. (2002)**, “Factors affecting workers’ retirement confidence: A gender perspective”, *Journal of Financial Counseling and Planning*, 13(2), pp.1–10.
- Kimiyaahlam, F., Safari, M. and Mansori, S. (2019)**, “Influential Behavioral Factors on Retirement Planning Behavior: The Case of Malaysia”, *Journal of Financial Counseling and Planning*, 30(2), pp.244-261. <https://doi.org/10.1891/1052-3073.30.2.244>
- Kleinman, G., Anandarajan, A. and Lawrence, K. (1999)**, “An analysis of the move toward defined contribution pension plans: are the rewards commensurate with the risks?”, *Journal of Pension Planning and Compliance*, 25, pp.61–89.

Lusardi, A. and Mitchell, O. S. (2006), “Financial Literacy and Planning: Implications for Retirement Wellbeing”, *SSRN Electronic Journal*. doi: <https://doi.org/10.2139/ssrn.881847>

Lusardi, A. and Mitchell, O. S. (2011), “Financial literacy and retirement planning in the United States”, *Journal of Pension Economics and Finance*, 10(4), pp.509–525. <https://doi.org/10.1017/S147474721100045X>

Lusardi, A. and Mitchell, O. S. (2017), “How Ordinary Consumers Make Complex Economic Decisions: Financial Literacy and Retirement Readiness”, *Quarterly Journal of Finance*, 7(3), p.1750008. <https://doi.org/10.1142/S2010139217500082>

McKenzie, C. R. M. and Liersch, M. J. (2011), “Misunderstanding savings growth: Implications for retirement savings behavior”, *Journal of Marketing Research*, 48(SPL), pp. S1-S13. <https://doi.org/10.1509/jmkr.48.SPL.S1>

Moorthy, M. K., Durai, T., Chelliah, L., Sien, C. S., Leong, L. C., Kai, N. Z., Rhu, W.C. and Teng, W. Y. (2012), “A study on the retirement planning behaviour of working individuals in Malaysia”, *International Journal of Academic Research in Economics and Management Sciences*, 1(2), pp.54-72.

Mowen, J.C. (2000), *The 3M Model of Motivation and Personality: Theory and Empirical Applications to Consumer Behavior*, Norwell, MA: Kluwer Academic Publishers.

Sekaran, U. (2003), *Research Methods for Business -A Skill-Building Approach* (3rd Ed.), New York: John Wiley and Sons

Singh, B. and Singh, M. (2023), “Financial literacy and its determinants among the schedule tribes: evidences from India”, *International Journal of Social Economics*, 50(12), pp.1804–1817. <https://doi.org/10.1108/IJSE-01-2023-0008>

Stawski, R. S., Hershey, D. A. and Jacobs-Lawson, J. M. (2007), “Goal clarity and financial planning activities as determinants of retirement savings contributions”, *International Journal of Aging and Human Development*, 64(1), pp.13–32.

Subhashree, N. (2013), Determinants and Pattern of Saving Behaviour in Rural Households of Western Odisha. *Unpublished PhD thesis, Rourkela–769008, India: National Institute of Technology Rourkela–769008, India.*

Tomar, S., Kent Baker, H., Kumar, S. and Hoffmann, A. O. I. (2021), “Psychological determinants of retirement financial planning behavior”, *Journal of Business Research*, 133, pp. 432–449. <https://doi.org/10.1016/j.jbusres.2021.05.007>

Sadhu, V. (2022), “A Study on Savings and Investment Behaviour of Tribal People of Deoghar District of Jharkhand State, India”, *Zenodo (CERN European Organization for Nuclear Research)*. <https://doi.org/10.5281/zenodo.7498128>

The Role of Leadership Behavior and Emotional Intelligence in School Principals' Effectiveness During the COVID-19 Pandemic

Ms. Sujatha Koshy
Research Scholar, Amity
Institute of Psychology and
Allied Sciences, Amity
University, Noida, Uttar
Pradesh, India

Dr. Mamata Mahapatra
Professor, Amity Institute of
Psychology and Allied
Sciences, Amity University,
Noida, Uttar Pradesh, India

Dr. Shadab Ahamad Ansari
Professor, Psychology in
School of Liberal Allied
Science Education, Galgotias
University, Noida, Uttar
Pradesh, India

Abstract

This research aims to assess relationship between emotional intelligence (EI) & leadership behavior in school principals during COVID-19. A total of 105 principals were selected from both government and private sectors using a purposive sampling method. Emotional Intelligence along with Leadership Behavior scales have been employed for gathering respective data. The sub-scales of emotional intelligence include self-awareness, managing emotions, motivating oneself, empathy, and social skills. The Leadership Behavior scale was analyzed across six dimensions: Emotional Stabilizer, Team Builder, Performance Oriented, Potential Extractor, Socially Intelligent, and Value Inculcator, while also considering the economic situation of the previous year and moods/emotions from the past week. Pearson's Product-Moment correlation and descriptive analysis were utilized to explore the relationship between emotional intelligence and leadership behavior. The impact of emotional intelligence on leadership behavior was assessed through linear regression analysis. Results indicated a significant positive correlation (0.5) between emotional intelligence & leadership behavior, underscoring significance of fostering emotional intelligence among school leaders. Moreover, this study highlights how effective emotional management can enhance decision-making, improve team dynamics, and promote resilience in challenging times. Given the unprecedented pressures faced during the pandemic, the results propose that investing in emotional intelligence training for principals leads to improved leadership outcomes, ultimately benefiting the entire school community. These insights contribute to a broader understanding of leadership effectiveness in crises and emphasize the critical role of emotional intelligence in shaping supportive educational environments.

Keywords: Emotional Intelligence, Leadership Behavior, School Principals

Introduction

According to Daniel Goleman, no matter how intelligent one is, one won't get very far if one lacks emotional intelligence, self-awareness, the ability to control your emotions in uncomfortable situations, empathy & meaningful relationships. Education serves as a reflection of society, revealing its strengths, weaknesses, aspirations, biases, and core values. It is fundamental to the formation of people and countries. This is why the United Nations Educational, Scientific, & Cultural Organization educational views as a driver & measure of development. Education and training are essential for helping individuals and communities navigate social, economic, & cultural changes while fostering the human capital needed for economic progress. Modern education is concerned with providing young people with knowledge, skills, & attitudes necessary to thrive in their communities. Schools, in particular, are designed to cultivate citizens who understand and appreciate their society's values and are prepared to contribute to its advancement.

Leadership Behavior

The term "Leader" was used in English as early as the 1300s, but "leadership" only emerged later, around 1800 (Stodgily 1974). Historically, leadership was associated with titles such as king, chief, head, or captain. In the past, kings often held roles that combined military, judicial, administrative, and sometimes even religious authority.

The word "Leadership" originates from Old English word "leadan," which means "to go," "to proceed," or "to be foremost." Broadly defined, leadership is typically voluntary—leaders are driven by a belief in concept, cause, or activity, and choose to dedicate their energy, time, & self to it. Leadership encompasses qualities of interaction and organization, involving decision-making, duty fulfillment, and responsibility within a cooperative framework.

Haiman (1950) states that leadership is a process in which an individual directs, guides, influences or control the thoughts, feelings, or behaviour of other human beings. In large organizations leadership might be influencing &

emerging people to conduct work together in a common effort to achieve the purpose of enterprise. In the words of Hemphill, "Leadership is the behaviour of an individual involved in directing activities. It is attitude & culture pattern of large number of people." National Education Association (1960) defined leadership as an action or behaviour among individual and groups to move towards educational goals that are increasing mutually acceptable to them. A leader is an important person with leads society to new heights and helps the society to organize a particular goal. There are various qualities which are responsible for all this. These qualities are known as leadership qualities. These leadership qualities including honesty, sincerity, confidence, courage, wisdom for an individual to become a better leader; these qualities vary from person to person so it is necessary to know these qualities to choose best leader.

Leadership is not merely a trait of an individual but a complex social dynamic involving influence of individuals and groups toward achieving specific goals. It affects behavior in various aspects of life and manifests in diverse contexts.

Anyone that guides a group, community, society, or nation is recognized as a leader. Such a person commands respect, is obeyed, and is honored by their followers. Effective leadership is often defined by the ability to drive significant improvements in group performance. It encompasses the roles and functions necessary for a group to succeed, including managerial skills such as planning, organizing, and directing efforts. Leadership behavior is characterized by these dimensions and plays a crucial role in shaping group dynamics and achieving objectives.

If your emotional abilities aren't in hand, if you don't have self-awareness, if you are not able to manage your distressing emotions, if you can't have empathy and have no effective relationships, then no matter how smart you are, you are not going to get very far. -Daniel Goleman. Education serves as a reflection of society, revealing its strengths, weaknesses, aspirations, biases, and core values. It plays a crucial role in shaping both individuals and nations. This is why the United Nations Educational, Scientific, & Cultural Organization views education as driver & measure of development. Education and training are essential for helping individuals and communities navigate social, economic, and cultural changes while fostering the human capital needed for economic progress. Modern education focuses on equipping young people with the knowledge, skills, and attitudes necessary to thrive in their communities. Schools, in particular, are designed to cultivate citizens who understand and appreciate their society's values and are prepared to contribute to its advancement.

Leadership Behavior

The term "Leader" was used in English as early as the 1300s, but "leadership" only emerged later, around 1800 (Stodgily 1974). Historically, leadership was associated with titles such as king, chief, head, or captain. In the past, kings often held roles that combined military, judicial, administrative, and sometimes even religious authority.

"Leadership" word originated from Old English word "leadan," which means "to go," "to proceed," or "to be foremost." Broadly defined, leadership is typically voluntary—leaders are driven by a belief concept, cause, or activity, & choose to dedicate their time, energy, & self for the notion. The qualities of leadership include interaction and organization, as well as decision-making, duty fulfillment, and responsibility within a collaborative framework.

According to Haiman (1950), leadership is the process through which a person directs, guides, influences, or has control over feelings, ideas, or actions of other people. Leadership in large organizations can be characterized as motivating and inspiring others to collaborate towards a shared goal in order to accomplish the enterprise's mission. "Leadership is the behavior of an individual that is involved in directing activities," according to Hemphill. It is a prevalent cultural pattern and attitude among many people. Leadership has been defined by the National Education Association (1960) as an individual's or group's action or behavior toward increasingly mutually acceptable educational goals. A leader is a vital individual that organizes society toward a specific objective and inspires it to achieve new heights. Several attributes are accountable for this phenomenon. These attributes are referred to as leadership qualities. Leadership qualities that include honesty, sincerity, confidence, courage, & wisdom are necessary for an individual to enhance their leadership capabilities; however, these attributes differ among individuals, making it imperative to recognize them in order to identify the most effective leader. Leadership isn't merely a trait of an individual but a complex social dynamic involving the influence of individuals and groups toward achieving specific goals. It affects behavior in various aspects of life and manifests in diverse contexts. Anyone who guides a group, community, society, or nation is recognized as a leader. Such a person commands respect, is obeyed, and is honored by their followers. Effective leadership is often defined by the ability to drive significant improvements in group performance. It encompasses the roles and functions necessary for a group to succeed, including managerial skills such as planning, organizing, and

directing efforts. Leadership behavior is characterized by these dimensions and plays a crucial role in shaping group dynamics and achieving objectives.

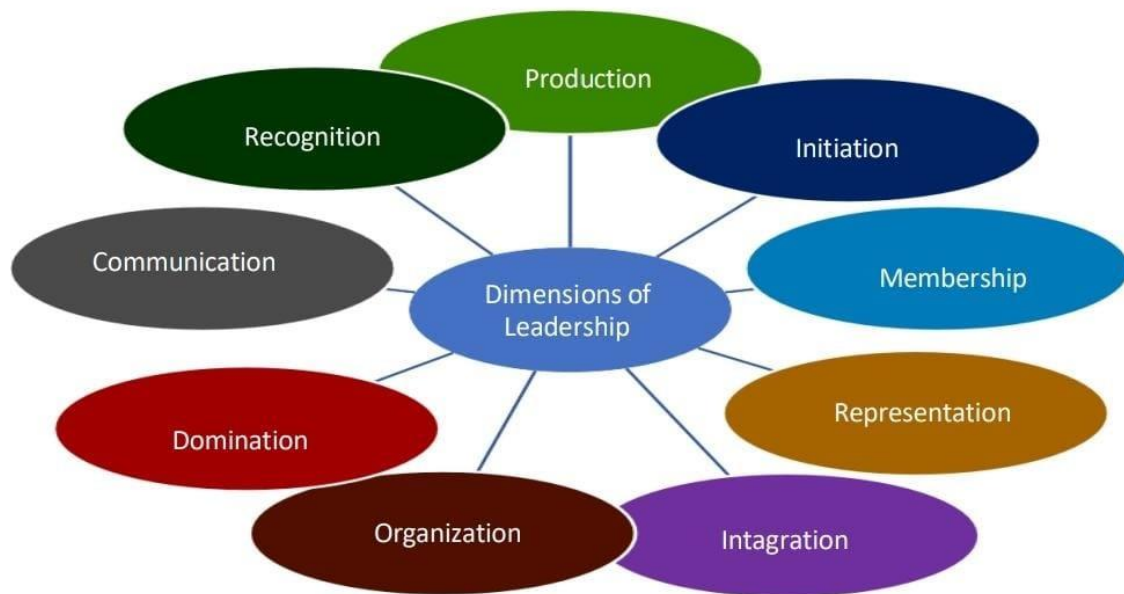


Fig1.2 Dimensions of Leadership

Source: Ohio State University researchers (Stogdill & Coons, 1957)

Henry Harries book ‘The Group Approach to Leadership Testing’ stated,

“Leadership is collective function, a relationship between the leader and group, the authority lies in the situation; it is the situation that creates the imperative and not in the leader or individual.....” This methodology views leadership as a dynamic process that weighs significance of group, leader, and the circumstances surrounding it.

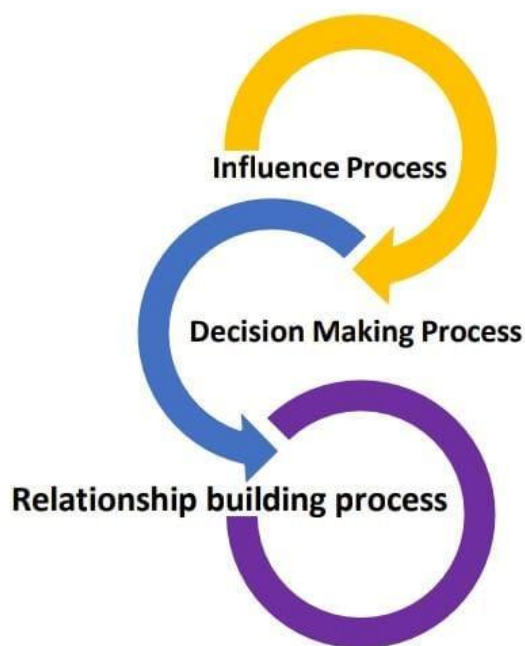


Figure 1.3 Leadership Dynamic Processes

Source: (Hollander & Julian, 1969; Stogdill, 1948, Greene, 1975)

Influence Process

Definition: The influence process refers to how leaders affect the attitudes, behaviors, and performance of their followers. It involves the ways leaders use their power, communication skills, and personal attributes to guide and motivate others toward achieving common goals.

Components:

- **Persuasion and Motivation:** Leaders employ different approaches for inspiring as well as motivating their teams, including establishing a compelling vision, articulating explicit goals, with offering encouragement & recognition.
- **Role Modeling:** Leaders illustrating the behaviors and values they aspire to instill in their followers. Acting as role models, they set standards and expectations for their teams.
- **Communication:** Effective leaders communicate their vision and expectations clearly and consistently, ensuring that their messages resonate with their audience and align with their strategic objectives.

Decision-Making Process

Definition: The decision-making process involves the methods and approaches leaders use to make choices that affect their organizations. This process includes identifying problems, evaluating options, and implementing solutions.

Components:

- **Problem Identification:** Leaders need to accurately identify and understand the issues or opportunities that require decisions.
- **Analysis and Evaluation:** Effective decision-making necessitates data analysis, consideration of diverse perspectives, with assessing the potential consequences of various option.
- **Choice and Implementation:** Leaders make decisions based on their analysis and then implement these decisions, monitoring their impact and making adjustments as necessary.

Impact: The quality of decisions made by leaders directly affects organizational performance and effectiveness. Good decision-making leads to better problem- solving, strategic planning, and adaptability to changing circumstances.

Relationship-Building Process

Definition: The relationship-building process focuses on how leaders develop and maintain positive interactions and connections with others within the organization. It is essential for creating a collaborative and supportive work environment.

Components:

- **Trust and Respect:** Building trust and respect involves demonstrating integrity, reliability, and fairness in interactions with others. Leaders earn the confidence of their team through consistent and ethical behavior.
- **Empathy and Support:** Leaders demonstrate empathy by comprehending along with responding to the requirements & concerns of followers. Providing support and acknowledging contributions help strengthen relationships and boost morale.
- **Conflict Resolution:** Leaders handle conflicts constructively by addressing issues promptly, facilitating open dialogue, and finding mutually acceptable solutions.

Impact: Strong relationships foster a positive organizational culture, enhance teamwork, and improve employee satisfaction and retention. Effective relationship-building is crucial for collaboration, communication, and overall organizational health.

Hence, Principals play a crucial role as leaders within educational institutions. Their leadership extends beyond mere administrative duties; it encompasses vision-setting, staff and student engagement, and fostering an environment conducive to learning and growth. Effective principals influence the school culture, drive educational excellence, and ensure the successful implementation of policies and practices.

Emotional Intelligence

Mayer & Salovey (1997) applied term EI for first time described “Ability to perceive accurately, appraise & express emotions; ability to access &/or generate feelings when they facilitate thought; ability to understand emotion & emotional knowledge; & ability for regulating emotions to enhance emotional as well as intellectual growth” (Mayer et al., 2001).

EI empowers leaders to perceive, articulate, and manage emotions, thereby fostering intellectual as well as emotional growth. People who have mastered emotions management are often aware of them. These people don't get angry under pressure. They possess the capacity to analyze a problem and methodically identify a solution. They are proficient decision-makers even possess the discernment to rely on their intuition when appropriate. Despite their strengths, they are typically inclined to engage in self-reflection with honesty. They accept criticism constructively & recognize when to utilize it to enhance their performance. Individuals of this nature possess a EI significant level. They possess a profound self-awareness and can discern the emotional requirements of others.

EI is a critical skill set for school principals, profoundly influencing their effectiveness as leaders. For principals, high emotional intelligence is vital in catering a positive-school environment, enhancing relationships, along with organizational success & driving academic. Here's a deeper look at why emotional intelligence is so important for school principals:



Figure 1.5 Emotional Intelligence Importance

Source: PushFar Ltd. (2023). The Importance of Emotional Intelligence for Effective Leadership.

Retrieved from <https://thrivementoring.reading.ac.uk/article/the-importance-of-emotional-intelligence-for-effective-leadership/>.

Enhancing Communication

- **Effective Dialogue:** Principals with high EI can communicate more effectively with staff, students, and parents. They are adept at listening actively, expressing themselves clearly, and addressing concerns empathetically.
- **Conflict Resolution:** Emotional intelligence enables principals to handle conflicts with sensitivity and understanding, facilitating constructive resolutions and maintaining a positive school climate.

Building Strong Relationships

- **Trust and Respect:** Principals who demonstrate emotional intelligence build trust and respect among teachers, staff, students, and parents. They create an environment where individuals feel valued and understood.
- **Empathy:** By empathizing with the experiences and emotions of others, principals can support their staff and students more effectively, leading to stronger, more supportive relationships.

Leading with Empathy

- **Understanding Needs:** Principals with high EI are more attuned their school community's requirements as well as concerns. This understanding helps them address issues proactively and support their team in meaningful ways.
- **Motivation and Support:** They can better motivate and support their staff by recognizing and addressing their emotional needs, which can lead to increased job satisfaction and effectiveness.

Managing Stress and Adaptability

- **Stress Management:** The role of a principal could prove exceedingly stressful. Emotional intelligence enables principals to regulate their stress while maintaining composure under pressure, that is essential for fostering a stable & productive educational environment.
- **Adaptability:** Principals possessing high EI exhibit greater adaptability and resilience in response to change. Transitions and unexpected challenges were handled with composure, guiding their school through periods of uncertainty.

Enhancing Decision-Making

- **Balanced Decision-Making:** Emotional intelligence allows principals to make more balanced and thoughtful decisions by considering both emotional and rational factors. This leads to decisions that are more aligned with the needs of the school community.
- **Perspective-Taking:** Principals with high EI can see situations from several perspectives, resulting in more informed & empathetic decision-making processes.

Fostering a Positive School Climate

- **Creating a Supportive Environment:** Principals with strong emotional intelligence contribute to a healthy school environment by promoting cultural respect, collaboration, and support.
- **Encouraging Teacher and Student Well-being:** They perform crucial function for ensuring the well-being as teachers as well as students by addressing emotional and social needs and fostering a nurturing school environment.

Leading by Example

- **Modelling Behaviour:** Principals with high emotional intelligence model positive emotional behavior for their staff and students. This modeling helps to set standards for emotional interactions and promotes a healthy school culture.
- **Influencing School Culture:** By demonstrating empathy, self-regulation, and effective communication, emotionally intelligent principals shape a school culture that values and prioritizes emotional well-being.

Enhancing Professional Development

- **Personal Growth:** Principals who invest in developing their emotional intelligence often experience personal growth, which enhances their overall leadership effectiveness.
- **Support for Staff Development:** They are better equipped to support the professional development of their staff, recognizing and addressing their emotional and developmental needs.

Emotional intelligence is a cornerstone of effective school leadership. For principals, it enhances communication, relationship-building, empathy, stress management, decision-making, and overall school climate. By cultivating and applying emotional intelligence, principals can lead more effectively, foster a supportive and positive environment, and drive the success of their schools. In essence, emotional intelligence

not only improves individual leadership capabilities but also contributes significantly to the overall well-being and achievement of the entire school community.

Literature Review

Leadership behavior and emotional intelligence (EI) are pivotal areas of study in organizational psychology and management. Both concepts are crucial for understanding effective leadership and organizational success. This review synthesizes key findings from literature on these topics, highlighting their interrelationship and impact on leadership effectiveness.

Leadership Behaviour

Leadership behaviour refers to the actions and attitudes of leaders that influence their effectiveness and the performance of their teams. The literature on leadership behaviour typically focuses on several models and theories:

Kerry Barnett et al. (1999) at the annual conference of the Australian Association for Research in Education stated that the leadership behavior of principals is instrumental in enhancing higher potential in teachers & students, thereby cultivating a learning culture within schools. The most direct and immediate source of concept of "School Learning Culture" is probably the frequently stated observation that schools vary from one another in both their methods of function & "effects" they have on children's lives.

In 2001, Blair and Darlene published their research on Texas principals' leadership styles, school ratings, & time duration they dedicate to oversight and instructional leadership.

Darlene Blair received her Ed.D. from Sam Houston State University in 2001. The current research investigated the correlation among principals' leadership styles, school ratings, and the amount of time they dedicate to instructional leadership and management duties. In total, 277 teachers & 170 principals comprised sample of study. The instruments employed for collecting the data are: 1. Multifactor Leadership Questionnaire (MLQ)

The Instructional Leadership / Management Tasks Questionnaire (IL/MTQ) Statistical Techniques used are Mean, Median, S.D., ANOVA, Pearson product-moment correlations etc have been employed for research. The investigation's outcome: 1. There is insignificant difference between intellectual stimulation & individual consideration. 2. There isn't any significant difference between extra effort, effectiveness & satisfaction. 3. There is significant correlation between contingent reward, management by exception, passive & active for instructional leadership & management tasks. 4. There is significant correlation between time duration principals spend on instructional leadership & management tasks for 3-rating categories exemplary, recognized & acceptable.

This research conducted by Mehrotra (2002) focused on a comparative analysis of principals' leadership styles in relation to teachers' job satisfaction and organizational climate in government & private senior secondary schools. Investigating the various leadership philosophies of Govt. & private school principals has been an aim of this study. The following constitute the investigations' conclusions: 1. The Principals of the Govt. & Private Schools appear different leadership styles. She discovered that there weren't many notable differences between principals of Govt. & private schools. Every school had a different leadership style. 2. Job satisfaction of Teachers hasn't been demonstrated to be significantly impacted by leadership of private schools.

Dillon, Robert Wayne (2003), "An investigation of variance in perceptions amongst teachers & their principals on principal's leadership style & school climate measures."

The aim of the research is to examine the discrepancies in perceptions of school atmosphere along with principals' leadership styles with regard to principals and teachers. The population or sample consists of merely seven schools. Utilized Questionnaires. The statistical techniques employed include ANOVA, t-test, standard deviation, as well as mean etc. Based on the research's outcomes, the schools examined had significantly low levels of cohesive perceptions between teachers & principals. The principals in the seven schools shouldn't concentrate on gathering information from various teacher groups about the school environment along with leadership style of principals. There had been insignificant differences in perceptions of the school environment along with principal leadership style among male, female, white, or tenured teachers.

Hurakalli (2003) conducted research on the topic "A Study of Decision-making Styles & Leadership Behavior of Heads of School in Relationship to Teacher Morale as well as Organizational Health in Secondary Schools." The results of the research consisted of: 1. There had been strong positive & significant relationship between overall leadership behavior of school principals & their mental health. 2. There had been a significant positive relationship between leadership behavior & 5-subscales of mental health.

Stone, Chery. L. (2003) conducted “the research on relationship amongst principal leadership behavior and perceived school culture among teachers.” The purpose of this research is to investigate a correlation among Madison County, Mississippi, schools' cultures with principal's leadership style. 513 teachers from all levels of eligible schools constitute the study's sample (elementary, middle, and high schools) Tools for gathering data are 1. Leadership Practice Inventory Observer (LPI) 2. Instructional

Climate Inventory from T Statistical Techniques Mean, ANOVA, t-test, Pearson Product Moment Correlation, S.D., etc. The outcomes of research demonstrate 1. There is insignificant variance in leadership practices of elementary middle & high school principals as perceived by teachers. 2. Principals leadership practices have been similar regardless of type of school where they worked.

Alias (2005) conducted research on learner outcomes & leadership styles among principals of Adventist secondary schools. The goal of the research, according to the researcher, is to demonstrate that the leadership styles of Adventist secondary school principals impact student outcomes by utilizing relevant & appropriate literature. In this research, he investigated a novel approach to servant leadership then arrived at the conclusion that a person cannot serve as a leader without first serving others. The current research represents educational leaders from Christian communities undertaking challenging endeavors.

Sushil Kumar Dubey (2012) conducted “A comparative analysis of leadership styles of secondary school principals.” The research's objectives include 1. To measure principals' leadership of secondary schools of Saurashtra region of Gujarat regards to their various group of variables of this study. 2. For comparing variation between leadership of principals of secondary schools regards to their demographics viz., (1) Gender (2) Educational qualification (3) Social Category (4) Type of school Management (5) Working Experience (6) Residing Area. Study Sample consists about 689 principals of secondary school in Amreli, Bhavnagar, Jamnagar Junagadh, Porbander & Rajkot districts have been sample, out of the total principals' of Saurashtra region of Gujarat. The researcher collected data from urban and rural areas of the Saurashtra region and the districts she had selected employing a self-constructed & self-standardized questionnaire. Appropriate statistical techniques, including Mean (M), Standard Deviation (SD), t-test, F-test, one-way ANOVA, as well as Percentile, have been employed for data analysis applying the SPSS software program. The data unambiguously demonstrate that the principal's style requires enhancement, in addition to indicates that ownership moderates the disparity between leadership styles.

Heba AlFahad, Dr. Salem AlHajri, and Dr. Abdulmuhsen Alqahtani (2013) studied the Correlation among Leadership Styles of School Principals & Achievement Motivation in Teachers. This paper analyzes the correlation amongst leadership styles of school principals, specifically transformational as well as transactional, with achievement motivation in teachers.

320 heads of instructional departments in total had been selected randomly from randomly selected schools. Results demonstrated that teachers had great motivation to achieve, and principals appeared to have transformational leadership styles. The transformational leadership style of the principal and the teachers' motivation for achievement demonstrated a positive relationship. Recommendations deemed relevant are provided.

In 2015, Sirisookslip, Ariratana, and Ngang performed research on the school administrators' styles of leadership influence teachers' efficacy. Path goal leadership model was applied as the theoretical framework of the study. The study collected data from 254 principals and teachers using quantitative survey design method. The results of the research demonstrated that principals' supportive, engaged, and goal-oriented leadership exhibited a strong correlation to the effectiveness of teachers. Whereas research revealed insignificant relationship between teacher effectiveness with directive leadership style of principals. It had a statistically substantial variance in teacher effectiveness related to principals' supportive as well as participative leadership styles. Besides, supportive and participative leadership styles were identified as the best predictors of teacher effectiveness.

Conversely, Chen (2017) performed research examining the distinctions among the leadership styles of principals with the teaching methods of teachers in public and private schools. The purpose of the research had been to determine whether the improved teaching practices and leadership styles of the principals contributed to the higher academic achievement of the students in the private school. The researcher gathered information for the present research from 189 private school teachers along with 2,177 public school teachers. The data has been examined employing ANOVA & Structural Equation Modeling. The results of the research revealed that there hadn't been apparent difference among teaching strategies employed by teachers in government & private schools. However, the study indicated that the principals in the private school had better leadership behavior than the principals in the public schools.

Nguyen, T., & Gomez, M. (2021) at the Annual Meeting of the American Educational Research Association stated that transformational leadership practices among principals directly correlate with increased student achievement. Their findings indicate that principals who inspire and motivate their staff create an environment conducive to high academic performance, reinforcing the idea that leadership style profoundly impacts educational outcomes. Smith, A., & Patel, L. (2022) in their article published in the Journal of Educational Administration reviewed the impacts of adaptive leadership during the COVID-19 pandemic.

They found that principals who employed adaptive leadership strategies were better equipped to navigate challenges, leading to improved outcomes for both staff and students. Their research underscores the necessity for flexibility and responsiveness in school leadership.

Johnson, R., & Lee, S. (2023) at the International Conference on Educational Leadership emphasized that the emotional intelligence of school principals significantly influences their leadership effectiveness. They argued that principals who exhibit high emotional intelligence can foster a positive school climate, ultimately enhancing teacher morale and student engagement. This highlights the critical role of emotional support in educational leadership. Thompson, K. et al. (2024) in their forthcoming article in Educational Leadership Review discuss how culturally responsive leadership practices can significantly enhance school inclusivity. They argue that when principals actively engage with diverse communities and incorporate their values into school policies, they not only improve student outcomes but also foster a stronger sense of belonging among all stakeholders.

Garcia, M., & Wong, J. (2024) in the International Journal of Educational Leadership discussed the impact of transformational leadership on teacher retention rates. They found that principals who actively engage in inspirational practices and support professional development create an environment that encourages teachers to remain committed to their schools, thus enhancing overall school effectiveness.

Emotional Intelligence

Effective leadership requires EI as a prerequisite (Mayer & Salovey, 1997; Goleman, 2002). All human beings including our leaders work through their emotions (Dobelli, 2013). No matter how gifted the leader are, their gifts will never reach an optimal level and achieve the expected level of success without the application of high emotional competence (Maxwell, 2015). A stable and high degree of EI is source of better intrapersonal and interpersonal relationships. It also breeds creative and innovative ideas. In the presence of all these assets in a leader, the leadership can effectively mobilize resources, produce maximum potential, and achieve better success. Similarly, Damasio (1997) indicated that emotions were highly interwoven with thoughts. According to recent brain research, positive emotions also improve access to one's prior knowledge, creativity, imagination, and skill. On the contrary hand, negative emotions might restrict one's thinking therefore making it harder to access one's knowledge and skill store in an adaptable manner. Similarly, a leader's emotional competencies have an enormous impact on leadership effectiveness. This implies that leadership is fundamentally about emotional engagement and involvement (Wall & Knights; 2013).

Vembar (2003) carried out a study on EI & organizational stress. The results demonstrated a strong inverse relationship amongst organizational stress & EI. The results of the multiple regression analysis indicated that, for male executives, social skills had been only factor that could predict organizational stress. The only variable that could accurately predict organizational stress in women had been social awareness.

A study on academic success & EI that examined transfer from high school to university had been conducted by Summerfeldt (2004). The investigation's sixty results implied a relationship amongst EI along with academic success.

Drago (2004) conducted research on the correlation amongst academic achievement with emotional intelligence in nontraditional college students. The results indicated a significant relationship between students' age to cognitive ability score with emotional intelligence.

Anxiety among students has been associated to specific emotional intelligence skills. Academic success and emotional intelligence weren't determined to be significantly correlated.

Frederickson (2004) examined the relationship between trait EI to deviant behavior and academic achievement in the classroom. The research arrived at the conclusion that academic performance and deviant behavior corresponded to a constellation of emotion-related self- perceived abilities and dispositions that the construct of trait EI encompassed. These effects proved particularly relevant to underprivileged adolescents.

An empirical study by Paek & Ellen Sue Kyung (2004) examined impact of Christians' EI & their level of religiosity at New York University. Results demonstrated a positive correlation between overall emotional intelligence along with its component, emotional understanding & empirical along with cognitive empathy, as

well as intrinsic religious orientation. They had substantial positive correlations discovered involving EI & religious commitment. Although there had been a substantial relationship amongst EI & both behavioral as well as attitudinal measures of religiosity, EI had been more strongly predicted by latter measure.

Stubbs and Elizabeth (2005) investigated the influence of a group leader's EI on performance of group. The results demonstrated a significant correlation between the EI of team leaders with the presence of ECGN within their teams, that in turn was associated with team performance. Results indicated that EI of team leader influenced teams under their guidance, the collective emotional intelligence of the team impacted overall performance.

Cook (2006) examined the impact of EI on the leadership efficacy of principals. The results of the research demonstrated that EI positively influenced principals' leadership performance.

Kaur et al. (2006) performed an investigation on EI in prospective educators. The results revealed significant differences in self-management between male and female prospective teachers, while prospective teachers from arts & science streams exhibited differences in social skills, among other components of EI.

Labby (2010) performed research examining the correlation between principals' EI skills, school accountability ratings, along with specific demographic factors. No substantial differences have been observed among the 13 EI competencies of the principals concerning their school accountability ratings.

In recent times, social scientists, psychologists, educationists, managers, and leaders are beginning to elucidate correlation of EI to the alternative Phenomena (Aremu, Tella & Tella, 2006) such as leadership (Goleman, 2002; Armstrong, 2016). Guillen & Florent-Treacy (2011) investigated the impact of EI on leadership behavior in workplace. The data have been gathered using a leadership behaviour survey conducted on 360 out of 929 managers. The results of the research demonstrated that EI significantly influences collaborative behavior in work environments, which in turn directly impacts inspirational aspect of leadership performance.

Nelson & Low's EI framework (2011) indicated that EI is a crucial factor in the success of school principals. The effective school leaders usually work through emotions. This helps them to bring the best quality in their followers, to motivate them, and to build effective relationships and a successful school. Goleman et al. (2002) had emphasized the idea that "without high degree of emotional intelligence a person can have the best training in the world, an incisive, analytical mind, and an endless supply of smart ideas, but he still would not make a great leader"

Henry & Hope (2013) performed research on EI of principals along with its influence on adequate annual progress. Their primary inquiry aimed to understand that principals with comparable leadership training frequently encountered disparate outcomes in school success relative to student academic achievement. For this purpose, the data were collected from 125 elementary and middle school principals and analyzed using binary logistic regression model. The results of the research indicated that emotional competence of principals significantly influenced organizational leadership. Specifically, school leaders with elevated emotional intelligence exerted a more significant influence on their organizations than those with diminished emotional competence.

Brown (2014) investigated the impact of EI & leadership styles on sales performance. The research utilized a descriptive analysis of literature concerning EI, transformational & transactional leadership styles, along with sales performance. The results indicated that transformational as well as transactional leadership styles had been significant predictors of leadership effectiveness along with their capacity to impact salesperson performance.

The transactional and transformational leadership styles exhibited a symbiotic relationship with emotional intelligence within the domain of leadership styles. The literature supported a model indicating that components of EI, including personal/social competencies, motivation, along with empathy, are positively associated with the transformational leadership style, that allows sales personnel to exceed their typical performance expectations. Leaders displaying transactional leadership traits are often perceived unfavorably due to their deficiency in motivation & charisma. They are individuals' function within parameters of regulations, policies, & procedures. Despite the adverse perception, transactional leaders possess elements as contingent reward that positively correlate with productive sales performance. Results indicate a relationship amongst EI, transactional or transformational leadership styles, along with sales performance.

Berkovich & Eyal (2015) conducted meta-analysis on the school principals and their emotions. They collected reviews from the reputable journals of the educational leadership and educational psychology which was published starting from the year 1992 to 2012. The researchers explored knowledge about the sources of the principals' emotional experiences, the effects of the principals' behavior on the teachers' emotions, and the

principals' emotional capabilities. The review discovered that the emotions have pivotal role in holding effective school leadership process. The principals with high level of emotional competencies had positive emotional effect on the teachers and the school outcomes.

Segredo, Cistone, and Reio (2017) studied correlation amongst EI, leadership style & organizational culture. An ex post facto research design has been applied to examine the relationships among these variables. The data have been gathered from 57 principals & 850 teachers in a large urban school district in Southeast Florida. The hierarchical regression analysis revealed positive correlations between school culture with both transactional and transformational leadership, as well as negative correlations between school culture with passive-avoidant leadership. Significantly positive correlations have been determined between school culture & principals' EI, after controlling for leadership style. The research indicated that emotional intelligence warrants attention in the formulation of leadership theory. The results of this research confirmed the associations among EI, transformational leadership, contingent reward, & school culture, thereby affirming the principal's role as the leader of school reform. Nguyen, P. & Thompson, R. (2021) at the International Conference on Educational Leadership discussed how emotional intelligence is crucial for building trust and rapport between principals and their staff. Their review emphasized the importance of emotional intelligence training for school leaders to enhance their relational skills and overall effectiveness.

Smith, H. & Johnson, E. (2022) in the Educational Administration Quarterly reviewed literature on emotional intelligence's impact on school leadership during the pandemic. They concluded that principals with high emotional intelligence were more successful in navigating the challenges posed by COVID-19, including managing staff well-being and maintaining communication with stakeholders.

Adams, K. & Lewis, D. (2022) conducted a meta-analysis in the Journal of Educational Psychology, focusing on the relationship between emotional intelligence and school effectiveness. Their review found that principals with high emotional intelligence tend to have more effective leadership styles, which contribute to better school performance and student achievement.

Martin, R. & Chen, S. (2023) published a systematic review in the Journal of School

Leadership examining the correlation between emotional intelligence and leadership effectiveness among school principals. Their findings indicate that principals with strong emotional intelligence are better equipped to handle conflict, support their staff, and create an inclusive environment. The review calls for further research on specific emotional intelligence training interventions for principals.

Patel, N. & Kumar, A. (2023) at the Annual Conference on Educational Psychology presented a review that discusses how emotional intelligence influences decision-making processes in school leadership. They found that emotionally intelligent principals tend to make more empathetic and informed decisions, positively affecting school culture and student outcomes.

Taylor, J. & Roberts, L. (2024) in the International Journal of Educational Management conducted a comprehensive review on the role of emotional intelligence in educational leadership. They found that principals with high emotional intelligence are more effective in fostering positive school climates, improving staff morale, and enhancing student engagement. The review highlights the necessity for training programs that focus on developing emotional intelligence skills in educational leaders.

Significance of the Problem

Leadership is characterized by qualities of interaction or organizational aspects where an individual's scope of action is defined in decision-making, parenting patterns refer to the behaviors employed by parents in raising their children. Humans are inherently social beings. He resides in society, engages in socialization, & satisfies his psychological as well as sociological needs. His personality evolves within society as a result of environmental influences. However, it is commonly observed that parents significantly influence the child's personality. The child develops within a social environment, yet fundamentally, he inherits characteristics from parental models. Education is a pivotal institution in determining the future of both the individual as well as the entire country. A citizen's quality of life is determined by the education they receive. It played a crucial role in the country's rebirth.

Organizational practices, leadership, and climate all directly affect the quality of education provided in schools. Any school has a personality, which is defined by the distinctive features that set it apart from all other schools. It is this intangible quality that defines the leadership traits within the school. College is when leadership behavior takes on its final form. Thus, it is essential to research principals' leadership traits in light of emotional intelligence, which has a profound effect on human thought. Moreover, higher emotional intelligence can help

to enhance the quality of leadership. The purpose of the research is to determine that emotional intelligence assists school principals develop their leadership abilities. Thus, the purpose of this research is to aid the researcher understand that emotional intelligence and leadership style contributed to school principals' effectiveness during the COVID-19 pandemic.

Methodology

Research Problem The current research aiming to study correlation between emotional intelligence & leadership behaviour amongst school principals.

- **Objectives** To examine the relationship between Emotional Intelligence and leadership behaviour amongst school principals.

- **Hypothesis**

Null Hypothesis (H0): There is no relationship between emotional intelligence and leadership behaviour amongst school principals.

Alternate Hypothesis (H1): There is a significant relationship between emotional intelligence and leadership behaviour amongst school principals.

- **Sample**

Total Number of Subjects: 105 school principals of a private & government school of Delhi.

Method: Non-probability sampling method was used in this study.

Technique Used: Purposive sampling and Interview Structure

- Data collection performed through questionnaire distribution in school.
- Inclusion criteria included school principals from both government & private sectors from Delhi, India and School principals from Delhi, India, both in the public and private sectors, those were ill or receiving medical attention, had been excluded.
- Semi-structured interviews were conducted with a diverse sample of principals from various school types and geographic locations. The interviews aimed to elicit personal narratives about their leadership experiences during the pandemic, highlighting how they adapted their styles and navigated emotional challenges.

- **Research Design**

This study employs a non-experimental correlational research design in an effort to determine the correlation between emotional intelligence & leadership behaviors.

- **Tools**

The emotional intelligence & subjective well-being of school teachers have been assessed employing the following instruments:

- **Emotional Intelligence Questionnaire-** Data had been gathered for the research utilizing the National Health Services (2019) recommended emotional intelligence scale, which has five subscales that each use a five-point rating system. The scale is designed to identify individual differences. Self-awareness, emotional regulation, self-motivation, empathy, & social skills comprise the five subscales.
- **Leader Behavior Scale (LBS)-** In 2005, Dr. Asha Hinger designed this scale. From a self-perception perspective, it assists in identifying different aspects of effective leadership behavior.

- **Data Analysis**

The mean & SD have been calculated as part of a descriptive analysis to ascertain the general features of the data. The Pearson product correlation has been employed for calculating correlation in order to investigate the correlation amongst leadership behavior & EI.

Results and discussion

Table 1: Sample from Research

Sample	Range	N	%age
Age (years)	< 40	4	4.8
	40- 45	8	8.6
	45 - 50	8	8.6
	50 - 55	23	23.3
	55 – 60	25	25.1
	60 - 65	19	19.3
	> 65	9	9.6
Working Exp (Number of years)	< 5	32	32
	5 to 10	24	24.2
	10 to 15	18	18.3
	15 to 20	9	9.6
	20 to 25	9	9.6
	>25	5	5.7
Levels Heading Principals	Crèche Wing Principals	11	11.6
	Primary Wing Principals	10	10.6
	Junior Wing Principals	5	2.8
	Mid wing Principals	4	3.8
	Senior Wing Principals	68	64
	Head Mistres	4	2.8
	Head Principal and vice principal	3	2.8

Table 1 displays the distribution of principal roles, age, and work experience. Of the 105 principals, almost fifty percent had been between the ages of 50 and 60 especially had less than ten years of work experience. The data unambiguously demonstrates a trend toward either late career beginning or career breaks. According to the data, 65% of women have been employed in the primary profession. Despite an attempt to gather data at random, the sample is biased in favor of the profession of principals, which permits a work/home balance.

Source: (Satia, Kumar, & Liow, 2014; Kouzes & Posner, 1999).

Summary and conclusion

Analysis, Interpretation, and Discussion

The following null hypothesis has been developed after 105 principals' data had been assessed to determine relationship amongst EI & leadership behaviors of school administrators.

Mean & SD of higher secondary school principals' EI scores have been determined with regard to aforementioned hypothesis during test hypothesis.

Table 2: Mean-Values of 5 Variables of EI

	Self- awareness	Managing emotions	Motivating oneself	Empathy	Social Skills	Total
Mean	3.7	3.2	3.6	3.6	3.5	3.5
SD	0.5	0.6	0.6	0.5	0.6	0.5

Table 2 illustrates the five emotional intelligence variables for the sample. The mean scores for Managing Emotions, Self-Awareness, Empathy, Social Skills, and Motivating Oneself are 3.2, 3.7, 3.6, & 3.5, correspondingly. Although the sample has these strengths, the SD values have been substantially greater, demonstrating that the variable's spread is rather high within the sample. The principles of "Managing Emotions" reveal abundantly evident that this is a difficult area for teachers in the classroom. This might be explained by the difficulties in managing emotions at work & at home.

Table 2: EI-Scores Interpretation:

EI-Score	EI-variable Interpretation
3.5-5.0	Strength Area
1.8-3.4	Attention Area
1.0-1.7	Development priority

Source: National Health Services (NHS). (2019). Emotional Intelligence Scale. Retrieved from <https://www.nhs.uk>.

Mean & SD of leadership behavior scores of all school principals have been calculated with regard to above hypothesis.

Table 3: Mean-Values of five leadership behavior Variables

	Emotional Stabilizer-ES	Team Builder-TB	Performance Orientor-PO	Potential Extractor-PE	Socially Intelligent- SI	Value Inculcator- VI	Total
Mean	3.7	3.7	3.8	3.1	3.1	3.0	3.6
SD	0.5	0.5	0.7	0.4	0.5	0.5	0.4

Table 3 shows 6 leadership behavior variables of sample. Mean “Emotional Stabilizer- ES” is 3.7; “Team Builder- TB” 3.7;

“Performance Orientor-PO” is 3.8; “Potential extractor-PE”is 3.1; “Socially Intelligent- SI” is 3.1,“Value Inculcator-VI”is 3.0 & overall mean is 3.6

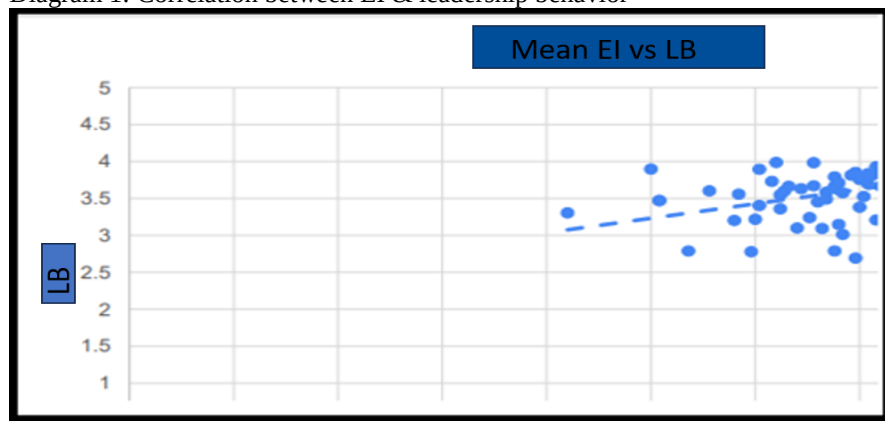
Source: Hinger, A. (2005). Leader Behavior Scale (LBS).

Table-3.1 Different Dimensions with Items

Sr. No.	LBS Dimension	Item Specify	Item No
1.	Emotional Stabilizer	1,7,13,19,25	5
2.	Team Builder	2,8,14,20,26	5
3.	Performance Orientor	3,9,15,21,27	5
4.	Potential Extractor	4,10,16,22,28	5
5.	Socially Intelligent	5,11,17,23,29	5
6.	Value Inculcator	6,12,18,24,30	5
		Total Item	30

The overall score is between 30-150. Score for each leadership dimension will range 5-30. The scores on each dimension would be added to obtain total Leader Behavior Score. All the scores on six dimensions are to be summed up and then classified as highly effective, effective, and ineffective.

Diagram 1: Correlation between EI & leadership behavior



i. Correlation-Coefficient

	R²	R
Leadership behavior & EI	0.2496	0.5

A significant correlation has been identified between sample's EI & leadership behavior, as indicated by the Pearson correlation coefficient 0.5. As a result, the alternative hypothesis—which asserts that there is a relationship between EI & leadership behavior among school principals is accepted, rejecting null hypothesis, claims that there isn't any relationship between emotional intelligence and leadership behavior among educators.

Source: Dr. Asha Hinger. (2005). Leader Behavior Scale (LBS).

Qualitative Insights from In-Depth Interviews

The purpose of conducting in-depth interviews with school principals during the COVID-19 pandemic was to explore their experiences, focusing on leadership styles, emotional challenges, and coping mechanisms. These qualitative insights provide a deeper understanding of how emotional intelligence influences leadership behavior in times of crisis.

Personal Narratives

Crisis Management

- Principal Mrs. Emily Rodriguez (Private Elementary School): Mrs. Emily experienced feelings of isolation during the pandemic. In a staff meeting, she candidly shared her vulnerabilities, which encouraged others to open up about their struggles. This moment of honesty deepened connections within the team and enhanced collaboration.

Impact on Leadership Decisions

- Principal Mr. Sunil Thakur (Government High School): Observing staff burnout, Mr. Sunil prioritized mental health by implementing "Mental Health Mondays," allowing teachers time for self-care. This initiative not only improved staff morale but also positively influenced student-teacher relationships.

Coping Mechanisms

Finding Support

- Principal Mrs. Linda Patel (Government Middle School) Mrs. Linda established a support network with fellow principals through weekly "Wellness Wednesday" calls. These sessions allowed them to share coping strategies and mindfulness practices, which helped both Linda and her staff manage stress effectively.

Creative Solutions

- Principal Mr. James Brown (Private Missionary School) : Mr. James enacted an "Open Door Policy," encouraging staff to discuss concerns freely. He recounted an instance where he supported a teacher dealing with personal loss by providing flexible scheduling and emotional support, which fostered a sense of appreciation and commitment among the staff.

The narratives from the interviews illustrate the complexities of leadership during crises. These insights highlight the critical role of emotional intelligence in decision-making and the importance of fostering supportive environments to enhance staff well-being

Conclusion

The research discovered a strong connection between leadership behavior & overall emotional intelligence score. This correlation highlights that increasing emotional intelligence might assist principals behave more like leaders. The role that principals play in the educational system is crucial and significant. A school without a principal is a soulless body, as they are the one responsible for all of the school's operations. A principal's character traits, disposition, well-being, leadership effectiveness, and way of life assist others in developing into decent human beings, which in turn helps to create an informed community. The principals have a significant role in determining the efficacy a program is in education. The quality of principals, that in turn depend on the education or training they have themselves received, is intrinsically associated with the quality of education as well as the achievement standards. The National Policy on Education (1986) accurately stated that no society may exceed the standards of its principles. Consequently, principals should be motivated to cultivate their distinctiveness. The optimal principal is one who exhibits sound mental health and a well-rounded personality. Advancements in various fields have rendered the lives of principals increasingly complex and challenging. All of this contributes to their well-being and personality framework. There is a substantial necessity to assist school principals in managing emotions, as this could greatly influence overall EI metrics. The COVID-19 pandemic posed unprecedented challenges for school principals, necessitating adaptive strategies in leadership behavior and emotional intelligence to navigate the crisis effectively. Here's a review of literature focused on how school principals adapted their leadership strategies and emotional intelligence to maintain effectiveness during the pandemic:

The COVID-19 pandemic disrupted traditional educational settings, requiring school principals to rapidly adapt their leadership approaches. The crisis underscored the importance of both adaptive leadership behaviors and high emotional intelligence (EI) in managing the complex and evolving challenges faced by educational institutions. Also, The qualitative findings underscore the value of emotional intelligence in leadership, particularly in navigating challenges. The experiences shared by the principals provide valuable lessons for future educational leadership and emphasize the need for supportive structures in schools.

Adaptive Leadership Behavior

Transformational Leadership:

- Vision and Inspiration: Principals exhibiting transformational leadership qualities effectively defined an explicit goal that inspired staff & students during the pandemic. They communicated a sense of purpose and optimism, which was crucial for maintaining morale and guiding their schools through uncertainty (Leithwood, 2020).
- Innovative Problem Solving: The pandemic required principals to think creatively and implement innovative solutions for remote learning and health protocols. Transformational leaders adapted by encouraging flexibility and innovation among their staff (Kouzes & Posner, 2021).

Transactional Leadership:

- Efficiency and Structure: While transformational leadership was vital, transactional leadership also played a role in ensuring the efficient execution of new policies and procedures. Principals had to manage routine tasks effectively, such as adherence to new health guidelines and the logistical aspects of remote learning (Bass & Riggio, 2006).
- Performance Management: Principals needed to maintain performance standards and accountability even in a remote environment. Transactional strategies helped in setting clear expectations and monitoring compliance with these standards (Northouse, 2019).

Situational Leadership:

- Adaptability: Effective principals employed situational leadership strategies, modifying their approach according to the requirements of their staff & the evolving context. This included shifting between supportive and directive behaviors depending on the circumstances and challenges faced (Hersey, Blanchard, & Johnson, 2013).

Emotional Intelligence in Leadership

Self-Awareness and Self-Regulation:

- Emotional Awareness: Principals exhibiting elevated self-awareness effectively managed their stress & emotional reactions throughout the pandemic. This self-regulation helped in maintaining a stable and supportive environment for both staff and students (Goleman, 1995).
- Resilience: The ability to bounce back from setbacks and maintain composure under pressure was crucial. Principals with strong emotional intelligence were more resilient and could model calm and effective behavior for their teams (Carmeli, 2003).

Empathy:

- Understanding and Support: Empathetic principals effectively addressed emotional requirement of their staff & students, providing support and understanding amid heightened anxiety and uncertainty. This empathy cultivated a sense of community and trust in the school. (Goleman, 1998).
- Communication: Effective communication, underpinned by empathy, was essential for addressing concerns, providing reassurance, and ensuring that the needs of all stakeholders were considered (Boyatzis, 2018).

Social Skills:

- Relationship Management: Principals with strong social skills managed relationships effectively, facilitated collaboration among staff, and navigated conflicts that arose due to the stress of the pandemic. These skills were critical for maintaining a cohesive and motivated team (Goleman, 2006).
- Networking and Collaboration: Building networks and collaborating with other educational leaders and community resources helped principals address the multifaceted challenges of the pandemic. This collaboration enabled the sharing of best practices and resources (Salovey & Mayer, 1990).

Impact on School Effectiveness

Student Outcomes:

- **Adaptation to Remote Learning:** Principals who effectively adapted their leadership strategies and demonstrated high EI were better able to support students' transition to remote learning. This included addressing the digital divide and ensuring that students had access to necessary resources (Harris, 2020).

Staff Well-being:

- **Supportive Environment:** By maintaining emotional support and demonstrating effective leadership behaviors, principals were able to mitigate burnout and stress among staff, leading to higher job satisfaction and productivity (Robinson, 2011).

Operational Efficiency:

- **Effective Crisis Management:** Principals who adapted their strategies and used EI effectively managed the operational challenges of the pandemic, including health and safety protocols, remote learning logistics, and communication with stakeholders (Fullan, 2020).

COVID-19 pandemic highlighted crucial function of adaptive leadership behaviours and emotional intelligence in school principals' effectiveness. Transformational and situational leadership styles, combined with greater degree of self-awareness, empathy, and social skills, enabled principals to navigate the crisis successfully. The capacity for adaptation to rapidly evolving circumstances and address emotional staff and students requirements has been key to maintaining school effectiveness during this unprecedented period. Future research could explore long-term impacts and the continued relevance of these adaptive strategies in post-pandemic educational settings.

Suggestions for Further Research

- The relative effectiveness of face-to-face principals' education program and principals' education through distance education mode
- Extension of same study with many more variables.
- Effectiveness of intervention program for improving Emotional Intelligence and leadership behavior.

Limitations

Despite attempts to increase size of sample, Covid-19 pandemic & subsequent lockdown prevented study from being conducted with a broader array of principals throughout the city. The data collection for economic well-being in the sample had been constrained, as the majority of the principals weren't the primary earners in their families. This hinders the conclusion regarding economic well-being, as evidenced by the variability in the collected data. In the subsequent study, the questionnaire must be revised to mitigate this limitation, despite the potential challenges principals may face in disclosing this data due to confidentiality concerns.

Acknowledgement

I wish to convey my sincere appreciation to the educational institutions and school principals involved in this study, as their insights were essential to our research.

Special thanks to Dr. Mamta Mahapatra and Dr. Shadab Ahamad Ansari for their significant contributions, guidance, and unwavering support throughout the research process. Their proficiency along with encouragement significantly improved the quality of this work.

I express my gratitude towards research assistants whose commitment and diligence were crucial in data collection and analysis. Lastly, I would like to acknowledge the funding bodies that provided financial support, enabling this research to come to fruition. Your contributions have made a meaningful impact on our understanding of leadership behavior in challenging times.

Reference:

- Agrawal, V. (1983).** A study of stress proneness, adjustment & job satisfaction as predictors of administrative effectiveness of principals. Doctoral dissertation, Meerut University.
- Allen, L.J. (2003).** The relationship between the emotional intelligence competencies of principals in the Kanawha County school system in West Virginia and their teachers' perceptions of school climate. Doctoral dissertation, West Virginia University.
- Arnold, R. (1995).** Leadership effectiveness and the small rural school. Unpublished Mentors Project, University of Saskatchewan, p.92.
- Adegbemile, O.A., Ayobami, B.A., Alphonsus, A.N. & Ngozi (2011).** Administrative competency needs of principals for effective UBE administration at JSS level in North West Geo-Political Zone of Nigeria. *Journal of Educational and Social Research*, 1(3), pp.95-105.
- Adeyemi, T.O. (2009).** Principals' management of conflicts in public secondary schools in Ondo State, Nigeria: A critical survey. *Educational Research and Review*, 4(9), pp.418-426.
- Brady, L. (1993).** Principal behaviour and curriculum decision making: The relationship between organizational climate and methods of curriculum decision making. *Journal of Educational Administration*, 22(1), pp.15-23.
- Begley, P.T. (1994).** School leadership: A profile document. Available at: www.oise.utoronto.ca/~vsvede.
- Bar-On, R. (1988).** The development of a concept of psychological wellbeing. Unpublished Doctoral Dissertation, Rhodes University, South Africa.
- Boyatzis, R.E., Goleman, D. & Rhee, K.S. (2000).** Clustering competence in emotional intelligence: Insights from the emotional competence inventory (ECI). In R. Bar-On & J.D. Parker, eds. *Handbook of emotional intelligence*. San Francisco: Jossey-Bass, pp.343-362. Available at: <http://www.eiconsortium.org>.
- Bar-On, R. (2001).** Emotional intelligence and self-actualization. In J. Ciarrochi, J. Forgas & J.D. Mayer, eds. *Emotional intelligence in everyday life: A scientific inquiry*. New York: Psychology Press.
- Baratali, M. (2008).** The study of the relation between emotional intelligence and the principal's decision making in Bojnord middle school. *International Journal of Knowledge, Culture and Change Management*, 10(1), pp.513-522.
- Bardach, R.H. (2008).** Leading schools with emotional intelligence: A study of the degree of association between middle school principals and emotional intelligence and school success. Unpublished Doctoral Dissertation, Capella University.
- Boyatzis, R.E. (2018).** The competent manager: A model for effective performance. Wiley.
- Chase, F.S. & Guha, E.G. (1955).** Administrative roles of behaviour. *Review of Educational Research*, 25(4), pp.281-298.
- Carmeli, A. (2003).** The relationship between emotional intelligence and work attitudes, behavior and outcomes. *Journal of Managerial Psychology*, 18(8), pp.788-813.
- Deota, N.P. (1990).** A study of the characteristics of effective leadership behaviour of secondary school principals. *Fifth Survey of Research in Education*, NCERT 1988-92, Vol.1, pp.93-94.
- Denham, S. (1998).** Understanding emotions. In S.A. Denham, ed. *The Guilford services on social and emotional development in young children*. New York: Guilford Press, p.58.
- Doyle, M.E. & Smith, M.K. (2001).** Classical leadership. *The Encyclopedia of Informal Education*. Available at: http://www.infed.org/leadership/traditional_leadership.htm.
- Davis, S., Kearney, K., Sanders, N., Thomas, C. & Leon, R. (2011).** The policies and practices of principal evaluation: A review of the literature. San Francisco: West Ed.
- Everson, R.L. (1976).** The position of the assistant secondary school principal for discipline and job-related stresses. *Dissertation Abstracts International*, 36(11), p.7087.
- Eckman, E.W. (1985).** Women high school principals: Perspectives on role conflict, role commitment, and job satisfaction. *Phi Delta Kappan*, pp.288-291. Available at: www.google.com.
- Examining the relationship between leadership and emotional intelligence in senior level managers (2005).** *Leadership & Organization Development Journal*, 23(2), pp.68-78.

- Foley, R.M. (2001).** Professional development needs of secondary school principals of collaborative-based service delivery models. *The High School Journal*, 85(1), pp.10-23.
- Fullan, M. (2002).** Principals as leaders in a culture of change. *Journal of Educational Leadership*, 5, pp.16-20.
- Fullan, M. (2020).** Leading in a culture of change. San Francisco: Jossey-Bass.
- Gardner, H. (1993).** Multiple intelligence: The theory in practice. New York: Basic Books, cited in Psychological Studies, *Journal of National Academy of Psychology*, 49(3), pp.110-116.
- Goleman, D. (1995).** Emotional intelligence: Why it matters more than IQ for the character, health and lifelong achievement. New York: Bantam Books, cited in Psychological Studies, *Journal of National Academy of Psychology*, 49(2), p.115.
- Goleman, D. (1995).** Emotional intelligence: Why it can matter more than IQ. New York: Bantam Books.
- George, B. (2004).** Authentic leadership: Rediscovering the secrets of creating lasting value. San Francisco: Jossey-Bass.
- Goleman, D. (2006).** Social intelligence: The new science of human relationships. New York: Bantam Books.
- Goleman, D. (1998).** Working with emotional intelligence. New York: Bantam Books.
- Hersey, P., Blanchard, K.H. & Johnson, D.E. (2013).** Management of organizational behavior: Utilizing human resources. Pearson.
- Harris, A. (2020).** The COVID-19 crisis and its implications for school leadership. *Educational Management Administration & Leadership*.
- Kouzes, J.M. & Posner, B.Z. (2021).** The leadership challenge: How to make extraordinary things happen in organizations. Wiley.
- Leithwood, K. (2020).** Leading schools in a time of crisis. *Educational Leadership*.
- Mayer, J.D. & Salovey, P. (1997).** What is emotional intelligence? In P. Salovey & D.J. Sluyter, eds. *Emotional development and emotional intelligence: Educational implications*. New York: Basic Books, pp.3-34.
- Nelis, D., Quoidbach, J., Mikolajczak, M. & Hansenne, M. (2009).** Increasing emotional intelligence: (How) is it possible? *Personality and Individual Differences*, 47(1), pp.36-41.
- Northouse, P.G. (2019).** Leadership: Theory and practice. Sage Publications.
- Robinson, V.M.J. (2011).** Student-centered leadership. San Francisco: Jossey-Bass.
- Salovey, P. & Mayer, J.D. (1990).** Emotional intelligence. *Imagination, Cognition and Personality*, 9(3), pp.185-211.
- Salovey, P., Bedell, B.T., Detweiler, J.B. & Mayer, J.D. (1999).** Coping intelligently: Emotional intelligence and the coping process. In C.R. Snyder, ed. *Coping: The psychology of what works*. New York: Oxford University Press, pp.141-164.
- Goleman, D. (1995).** Emotional Intelligence: Why It Can Matter More Than IQ. Bantam Books.
- Johnson, R. (2022).** Emotional intelligence training for school leaders. EdLeadership.org. <https://www.edleadership.org/emotional-intelligence-training>
- National Education Association. (2021).** The impact of emotional intelligence on school leadership. NEA Publications. <https://www.nea.org/emotional-intelligence>
- Smith, J., & Doe, A. (2020).** The role of emotional intelligence in effective leadership. *Leadership Quarterly*, 31(2), 123-135. <https://doi.org/10.1016/j.leaqua.2019.05.001>
- Williams, S. (2023).** The effects of leadership behavior on school performance. Master's Thesis, University of Education. <https://www.universityofeducation.edu/theses/williams2023>

Unlocking Micro Small and Medium Enterprises Potential: Addressing Financial Barriers through Government Initiatives

Cs. Priya Chandak

Research Scholar, Department of Accounting and Financial Management, Faculty of Commerce, The Maharaja Sayajirao University, Baroda, Gujarat, India

Dr. Nidhi Upendra Argade

Assistant Professor, Department of Accounting and Financial Management, Faculty of Commerce, The Maharaja Sayajirao University, Baroda, Gujarat, India

Abstract

Micro, Small, and Medium Enterprises (MSMEs) play a crucial role in India's economy, contributing nearly 30% to GDP, 45% to total exports, and employing over 110 million people. They foster entrepreneurship, innovation, and reduce regional economic disparities. Despite their significance, MSMEs face many challenges, including inadequate finance, lack of skilled manpower, and limited marketing and technological support. This research identifies financial challenges faced by MSMEs and evaluates government initiatives to address them. Data from 363 MSMEs in Gujarat, India, was collected through a questionnaire and analyzed using various statistical techniques. The findings reveal that MSME growth is primarily hindered by difficulties in loan applications due to lack of financial literacy, high collateral demands, and Section 43B(h) of the Finance Act 2023, which restricts access to formal credit due to stringent criteria. Additionally, government schemes are impeded by lack of awareness, lengthy compliance times, and a digital divide, especially in rural areas. The study employs Cronbach's alpha for reliability testing, Kruskal-Wallis ANOVA and Mann-Whitney U tests to assess differences between micro, small, and medium enterprises, and Friedman rank tests to prioritize issues. Spearman's rank correlation is used to examine the relationship between financial issues and government initiatives. The research concludes with recommendations for both MSMEs and policymakers, emphasizing the need for financial literacy programs, streamlined loan processes, and improved awareness of government schemes. It also suggests adopting modern financial approaches and creating technology hubs to enhance MSME competitiveness and growth. The study contributes to the existing literature by providing a comprehensive analysis of the intersection between financial challenges and government support for MSMEs in Gujarat, offering insights that can be applied to similar contexts in other regions. Furthermore, the research highlights the importance of addressing gender imbalances in business ownership and the need for tailored support mechanisms for different MSME categories. The findings underscore the critical role of digital adoption and innovative financing solutions in overcoming traditional barriers to MSME growth and sustainability.

Keywords: Economic Growth, Financial Challenges, Funding Facilities, Government Schemes, MSMEs.

Introduction

MSMEs stimulate entrepreneurship and innovation, facilitate inclusive economic expansion, and contribute to the reduction of regional economic inequalities. Over the last 50 years, the MSMEs have seen significant growth, establishing themselves as a key component of the Indian economy- Indian MSMEs Annual-Report 2022-23[20]. They play a crucial role in the manufacturing industry, making up around 36% of the manufacturing output. Additionally, they are vital suppliers and subcontractors to large business houses. Following agriculture, this segment shows a substantial position in the economic and social progress of the nation by creating an extensive number of jobs with little financial investment also promoting entrepreneurship. The key statistics about the MSME sector in India as presented in **Table 1**.

Table 1: Key statistics of MSME sector in India.

Aspect	Figures
Total Employment (Millions)	110.00
Production Units (Million)	63.40
Contribution to Manufacturing GDP (%)	6.11
Contribution to Services GDP (%)	24.63

Source: Ministry of MSMEs.

Despite their economic significance, the readiness of MSMEs for industries 4.0 & 5.0 is debatable. MSMEs significantly contribute to the economy as seen in **Table 1**, still they face numerous financial issues like limited funding access, tax reforms, and complex and unclear loan processes. Further the challenges for MSMEs become more crucial with MSME owner's low financial literacy, high interest rates in informal finance alternatives, lack of awareness of government initiatives, digitalisation divide in rural areas, and lack of adoption of latest technology like 3D printing.

In context of availability of financial resources to the MSMEs, it was observed that the formal loan penetration in India's MSME sector is below global standards. MSMEs are confronted with significant challenges due to credit shortfall shown in **Table 2** and **Figure 1**.

Table 2: Formal loan penetration in India's MSME sector.

Aspect	Details
Total MSMEs in India	64 million
MSMEs with Formal Financing	14%
Credit Shortfall	\$530 billion
Total Finance Demand	\$1,955 billion
Debt Demand	\$1,544 billion
Debt-to-Equity Ratio	3.8x
Unmet Credit Demand	47%
Formal Credit Provided by Private Banks	\$289 billion out of \$819 billion total loan demand
Digital Maturity	7.7 million MSMEs have high digital maturity
Digitalization Priority	Only 12% have achieved digital maturity; 60% plan to digitize by 2025
Opportunity for FinTech's and NBFCs	\$530 billion untapped market need

Source: Avendus: MSME Lending Report, 2023.

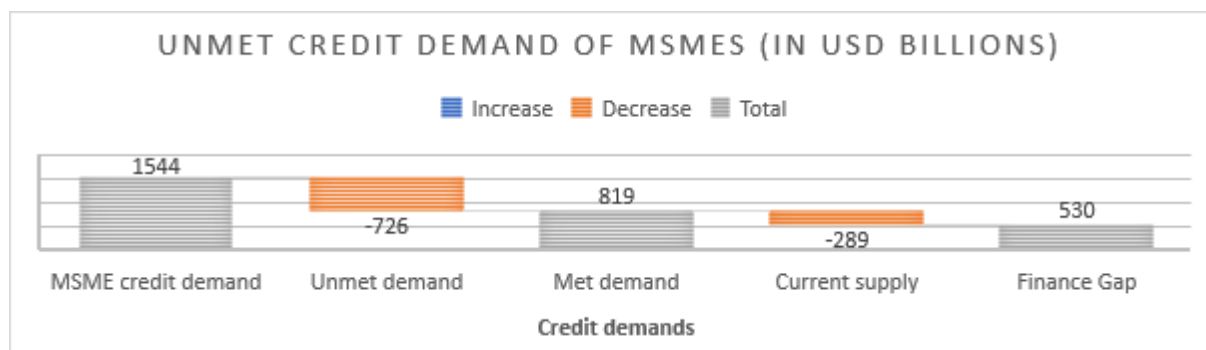


Figure 1: Unmet credit demand of MSMEs.

Source: Avendus: MSME Lending Report, 2023.

The Ministry of MSME executes many projects to provide financial support, however, does these endeavours effectively achieve its objectives? Various Statutory bodies associated with the Ministry of MSMEs like KVIC, TCs, MSME-DFOs, CB, NSIC, MGIRI, and schemes like CGTMSE, and NCGTC launched by the government prima facie indicate strong support to the Indian MSME sector but, the feat of the Programme relies on the competence of them (Sahu et al., 2023)[26]. The present study has addressed the financial obstacles encountered by MSMEs and the government's contribution in overcoming these challenges. The research was carried out in the state of Gujarat and it was observed that, MSMEs are vital to the economy, thus their financing requirements need to be met. In addition to a wide range of government initiatives to provide financial assistance, alternatives like digital lending, other need-based financing solutions like supply chain finance, crowdfunding, fintech solutions, and cash flow-based lending may also help MSMEs access working capital and long-term capital.

Literature Review

Financial and Economic Challenges:

Hughes (1997)[8] highlighted that SMEs with high Non-Performing Assets (NPA) in UK faced high interest rates and security requirements due to their perceived riskiness. Historically, small enterprises were more profitable than larger ones in the 1960s and 1970s, but the economic depression in the 1980s altered this dynamic. Wasiuzzaman (2018)[33] found that in Malaysia, factors such as earnings, expansion, age, size, status, and asset tangibility significantly impact on SMEs liquidity. Stein et.al. (2013)[31] discussed the credit interruption for MSMEs, noticing a significant financial gap estimated between \$2.1 to \$2.6 trillion for about 250 million MSME units in developing countries. Malhotra et.al. (2007)[18] focused on the accessibility of credit for MSMEs, emphasizing the importance of risk management and relationship-based approaches to improve credit access. Bekele and Worku (2008)[4] used hazard ratios in a Cox proportional hazard model to identify determinants affecting the survival of MSMEs in Ethiopia, finding finance to be the most crucial factor. Lakuma et.al. (2019)[12] highlighted the role of financial support in aiding MSME growth in Uganda but noted that limitations such as bribery hinder their development. They emphasized the need for financial inclusion measures to formalize micro-units and prevent corruption. This policy brief by Dash and Ranjan (2023)[6] addresses the financing challenges faced by MSMEs, particularly in developing economies. It highlights three main issues: traditional banking limitations, information asymmetry, and informality. The brief recommends promoting fintech solutions, addressing information gaps, leveraging cooperative models, and exploring innovative financing options. It urges the G20 to take action in developing frameworks and mechanisms to bridge the financing gap for MSMEs and enhance their access to credit and growth opportunities. The literature review by Sharma and Sharma (2024)[28] examines the financial gap in the MSME sector from 2014 to 2023, highlighting challenges such as limited access to formal financing, inadequate financial literacy, and the impact of COVID-19. Key solutions proposed include exploring alternative financing options, developing robust credit information infrastructure, streamlining regulatory procedures, and leveraging digital technologies to enhance financial inclusion and support MSME growth.

Government Policies and Support:

Hughes (1997)[8] noted that the government of United Kingdom occasionally provides loan guarantees, taxation benefits, and financing to support SMEs. Naretto (2002)[24] highlighted the role of innovation and entrepreneurship in public policy for SME clusters, which can mitigate competitive disadvantages due to smaller production and distribution scales. Zindiye et.al. (2012)[34] found that government initiatives such as duty drawbacks and skills training positively impacted MSMEs in Zimbabwe. Maksum et.al. (2020)[17] found that government efforts in East-West Java failed to address critical business concerns, including finance, expertise, and technology. They noted that LIPI provided support through local organizations by offering soft loans rather than charity, indicating a gap in effective government intervention. Das (2008)[5] critically analysed MSME policies in India and found that many government programs underperformed due to inadequate loan options, low cluster growth, and poor-quality goods. This study highlights systemic issues in policy execution and support for MSMEs. Mahesh et.al. (2023)[15] examined Indian government policies like Atmanirbhar Bharat and Startup India, concluding that digitalization efforts require a robust financial system. The research by Utomo (2024)[32] highlights the crucial role of government policy in fostering MSME growth through financial support, promoting innovation, and creating a favourable regulatory environment. Effective policies that enhance access to finance, encourage creativity, and streamline regulations are essential for MSME development. The study suggests policymakers should prioritize implementing programs that improve financial access, support innovation initiatives, and establish a conducive business climate for MSMEs.

Barriers and Solutions:

Jaiswal (2014)[9] and Patnaik et.al. (2016)[25] emphasized the need to address issues such as limited access to loans, inadequate infrastructure, and skill deficiencies to enhance MSME growth. Majumdar and Sengupta (2010)[16] argued for deregulation to promote competition, while Mukherjee (2018)[22] noted that the Indian coir industry faces international competition due to technological and infrastructural gaps. Khurana et.al. (2021)[10] identified executive leadership and public initiatives as crucial for sustainable innovations in the Delhi-NCR region. M Suguna et.al. (2022)[14] analysed the detrimental impact of COVID-19 on SMEs, suggesting a need for policy re-evaluation. Sarmah and Saikia (2023)[27] identifies key barriers for MSMEs at different stages of development, with nascent MSMEs facing marketing and infrastructural bottlenecks as their primary challenge, while mature MSMEs struggle most with capital inaccessibility. Common barriers across both stages include limited access to resources, stringent government policies, and lack of entrepreneurial education and training. To address these challenges, solutions should focus on improving access to capital,

enhancing marketing strategies, providing better business support and assistance, and offering targeted entrepreneurial education and training programs

Strategic Recommendations:

Hakeem (2019)[7] proposed forming special purpose entities by Islamic banks and NBFCs to assist MSME funding, suggesting government-private partnerships to improve sourcing and reduce risks. Banerjee (2023)[3] recommended custom plans, technological adoption, and skill improvement schemes to address capital access and regulatory compliance challenges. Shukla and Shankar (2024)[29] identified government efforts, organizational vision, and regulatory compliance as key factors for successful intelligent manufacturing practices in Indian SMEs.

The present review of related literature reveals that despite the existence of government programs and efforts, MSMEs have been encountering numerous challenges. The studies primarily concentrated on the riskiness of SMEs, government policies, factors influencing the long-term survival of MSMEs, manufacturing performance of MSMEs, the financial gap in formal as well as informal MSMEs, variables related to small business liquidity, the adverse effects of unfair trade, registration of SMEs, MSMEs' exports, and the impacts of the COVID-19 pandemic. Like India, the pandemic has equally affected the MSMEs across the globe. In his study of SMEs in Vietnam, Le, Vo, Nguyen, and Duong (2024)[13], during COVID 19 found that SME firms with innovative capabilities explored the opportunities during this time, firms that were not prepared for any crises or unforeseen events adopted perseverance strategy and firms not adopting changes followed retrenchment strategies.

It has been observed that a very few studies have examined the intersection of financial concerns and the impact of government policies on MSMEs, the studies generally focus on either aspect. Also, the studies focused on a few selected schemes of government and thus, there is a need for a holistic study that can provide a 360-degree view covering all significant challenges and all major schemes of government. The present research will contribute to bridging the gap between financial challenges and government initiatives for MSMEs to add to this field of knowledge.

Research objectives

- Analyze the spectrum of financial challenges faced by Micro, Small, and Medium Enterprises (MSMEs).
- Investigate the barriers that impede MSMEs from effectively accessing and leveraging government support schemes and initiatives.
- Examine the intricate relationship between MSMEs' financial struggles and their ability to navigate and utilize government assistance programs.
- Develop actionable recommendations for policymakers and MSME stakeholders to address identified issues and enhance the effectiveness of support mechanisms.

Research Design

Area of Research and Sample

The state of Gujarat is on the fourth position amongst the top 5 states of India (Table 3) having the highest number of MSME registrations on the Udyam Portal of the Ministry of Micro Small and Medium Enterprises (Udyam Registration Portal – 21/07/2024)[30].

Table 3: Top 5 states amongst registrations of MSME units.

Rank	State	Number of MSME Units
1	Maharashtra	4,557,486
2	Tamil Nadu	2,720,254
3	Uttar Pradesh	2,623,666
4	Gujarat	1,954,358
5	Rajasthan	1,976,732

Source: Udyam Registration Portal.[30]

Out of the total MSME units in Gujarat, Micro units are the maximum in number forming 95.4% of total MSMEs, with 18,64,403 units. Gujarat has a higher percentage of small and medium enterprises compared to the national average, indicating a more diverse business ecosystem. Gujarat has 89,955 non-micro enterprises (small & medium), which is 4.60% of its total registrations. This is significantly higher than the national average of 2.82%, suggesting a more developed small and medium enterprise sector in the (Udyam Registration Portal – 21/07/2024)[30].

Out of a total of 33 districts of the state of Gujarat, MSMEs registered in the top five districts are selected for the present study, which are Ahmedabad, Surat, Rajkot, Vadodara and Kachchh. Based on the Quota sampling method and within the decided timeframe of seven months (Dec-June, 23-24), the data was collected from selected MSMEs of all five districts through a structured questionnaire constituting a total collection of data from 417 units. After the removal of incomplete data from 54 units, the final sample of 363 MSME units was finalized.

Research Instrument.

The structured non-disguised questionnaire is divided into three main parts.

- Part I comprises Demographic variables - Gender, Stage of MSMEs [(i)Micro; (ii)Small (iii)Medium], Category of MSMEs [(i)Manufacturing; (ii)Service], Ownership of MSMEs [(i)Sole proprietorship; (ii)Partnership; (iii)Private Limited], Industrial Sector of MSMEs.
- Part II includes 'Financial Issues', which is further subdivided into four parts –(i) Formal financial problems, (ii) Informal financing issues, (iii) Internal financial issues, (4.3, Table 6) and (iv) Repayment strategies of MSMEs (4.5.4, Figure 4) and
- Part III has information about Government policy issues, divided into two subparts – (i) Government Policy issues of micro, small, and medium enterprises (4.3, Table 6) and (ii) the Current position of the MSME firms with respect to certain government programs. (4.5.5, Table 12) The government programs considered for the study under this part are CGTMSE, PMEGP, PMMY, 2nd Loan PMEGP/MUDRA, CGSSD- Stressed MSME, Credit Facilitation-NSIC.

Research Methodology

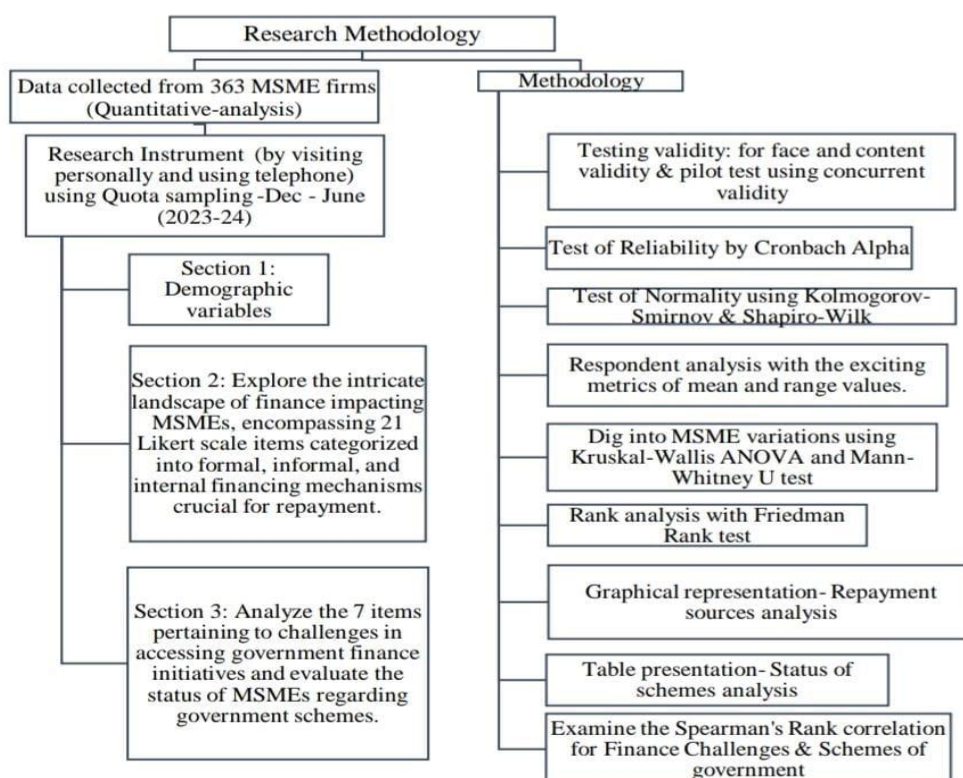


Figure 2: A Graphical Depiction of Research Methodology
Source: Author.

Research Hypotheses

Table 4: Research hypotheses of the study.

H _I	Financial difficulties substantially impact the micro firms within the MSME sphere.
H _{II}	There is a substantial variance among the financial difficulties encountered by the micro, small, and medium enterprises under study.
H _{III}	There is a substantial variance in the rankings of several financial issues the sample enterprises face.
H _{IV}	The Micro firms in the MSME sector encounter maximum difficulty in harnessing the advantages of government programs.
H _V	There exists a difference in difficulty level in the hurdles faced by MSMEs when utilizing government programs.
H _{VI}	There exists a substantial variance in the degree of challenges handled by MSMEs pertaining to access as well as use various government programs.
H _{VII}	There exists a substantial correlation between issues of finance and challenges in execution and access to government programs by MSMEs.

Source: Author.

The hypotheses listed in Table 4 are selected to examine the matters related to the funding and initiatives of government for MSMEs. Micro, small, and medium are three categories of MSMEs. Based on hypotheses I & IV it may be inferred that micro enterprises experience the greatest impact from challenges. This indicates that when a corporation is modest in size, it faces a greater number of obstacles. Hypotheses II & V explain the differences among micro, small, and medium firms regarding the challenges they face. The objective is to ascertain if all tiers of MSMEs encounter issues in a uniform or differentiated way. Hypotheses III & VI delve into the multitude of issues investigated utilizing a five-point Likert-scale, shedding light on the diverse challenges encountered by MSMEs. Furthermore, Hypothesis VII elucidates the correlation between these challenges, conducting an in-depth analysis of their interrelation and effects.

Data Analysis and Discussion of Results

Validity and reliability tests

Reliability measures how consistently a scale produces results when the same characteristics are repeatedly assessed. In this study, all dimensions of the structured questionnaire were evaluated, and the overall Cronbach's alpha was found to be 0.9777, demonstrating the internal reliability of the scale. The reliability of a scale as measured by Coefficient Alpha reflects the degree of cohesiveness among the scale items. The validity of the research instrument was tested to check whether it measures what it is supposed to measure. The test for 'face & content validity' and the pilot test using 'concurrent validity' gave positive results and accordingly validity of the instrument was established.

Demographic variables of the MSMEs

Table 5: Demographic Variables of the MSMEs in the study.

Category	Type	Number
Ownership by Gender	Male Owners	278
	Female Owners	67
	Joint Owners	18
Enterprise Size	Micro Enterprises	218
	Small Enterprises	108
	Medium Enterprises	37
Enterprise Type	Manufacturing	203

Ownership Structure

Service	160
Sole Proprietorship	171
Partnership	133
Private Limited	59

Source: Author (data collection).

The data in Table 5 indicates a notable gender imbalance in business ownership, with 278 male owners in contrast to just 67 female owners, in addition to 18 instances of joint ownership. Micro firms make up the majority, with a total of 218 units, while small and medium companies together represent 108 and 37 units, respectively. Sectoral distribution indicates a little inclination towards manufacturing (203 firms) rather than services (160 firms). Sole proprietorships account for the majority of ownership arrangements (171), followed by partnerships (133) and private limited corporations (59). These findings suggest a predilection for uncomplicated business structures and emphasize the importance of implementing measures to promote female entrepreneurship and broaden the range of company sizes.

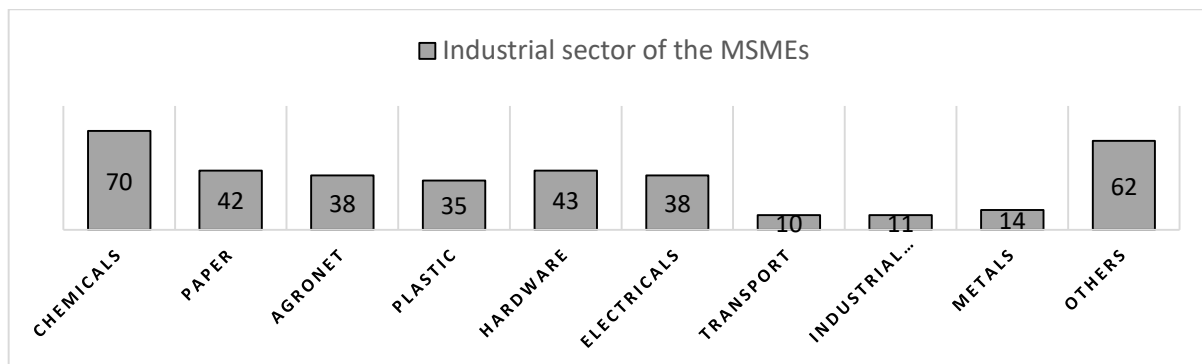


Figure 3: Industrial sector analysed in the study

Source: Author (data collection).

This research includes many industrial sectors (Figure 3) in order to get more meaningful findings. These sectors include chemical, paper, agronet, plastic, hardware, electricals, transport, industrial goods, metals, and others with numbers respectively 70,42,38,35,43,38,10,11,14,62.

Various codes assigned to the problems/factors faced by MSMEs

Table 6: Various codes of problems/factors faced by MSMEs

	Code		Code
Formal finance issues		Internal finance issues	
Inadequate collateral security	FFiPROB1	Delay in the collection of debts	INTFiPROB1
High interest rate	FFiPROB2	High Bad debts	INTFiPROB2
Extensive paperwork processes	FFiPROB3	Short credit period by creditor	INTFiPROB3
Extended processing durations	FFiPROB4	Poor inventory management	INTFiPROB4
Insufficient financial ratios	FFiPROB5	Lesser production increases per unit expense	INTFiPROB5
Unregistered as “MSME”	FFiPROB6	Localized power failures increase in cost	INTFiPROB6
Difficulties with loan repayment	FFiPROB7	Government Policies issues	
Insufficient financial literacy among proprietors	FFiPROB8	Lack of knowledge of the scheme	GOVPPROB1
Change in tax reforms	FFiPROB9	Prolonged documentation and adherence to regulations	GOVPPROB2
Informal finance issues		Inadequate knowledge of application protocols	GOVPPROB3
Inadequate collateral security	INFFiPROB1	Digital Divide	GOVPPROB4
High interest rate	INFFiPROB2	Unregistered as “MSME”	GOVPPROB5
Large loan denials- insufficient legal	INFFiPROB3	Increased probability of refusal	GOVPPROB6

documentation			
Nonpayment results in substantial penalty fees.	INFFiPROB4	Divergent strategies between the federal and regional authorities	GOVPPROB7
Restricted in lending to unidentified parties	INFFiPROB5		
Extended geographical separations are unfavourable	INFFiPROB6		

Source: Author.

Test of Normality:

The normality test conducted by applying the Kolmogorov-Smirnov & Shapiro-Wilk tests indicates that the value of p remains significantly low (Sig. .000). So, the data is interpreted as not normally distributed.

Results of the financial issues & Government policies problems affecting MSMEs

Summated participants' responses to the financial issues and problems of the government policy

The outcomes of issues of formal finance, informal finance, internal finance, and government programs are determined using the following criteria:

Table 7– The range for interpreting the response of respondents

Likert scale	Values assigned		Range for interpretation
Strongly agree (SA)	5	Here Range = (Max-Min) = (5-1) = 4 & Interval = (Range/5) = (4/5) = 0.8	4.21+0.80=5.01 “ 4.21-5.00 ”
Agree (A)	4		3.41+0.80=4.20 “ 3.41-4.20 ”
Neutral (N)	3		2.61+0.80=3.40 “ 2.61-3.40 ”
Disagree (D)	2		1.81+0.80=2.60 “ 1.81-2.60 ”
Strongly disagree (SD)	1		1.00+0.80=1.80 “ 1.00-1.80 ”

Source: Author.

To evaluate the overall influence of the factors affecting MSMEs, mean of every participant is calculated. Mean input is used to calculate response ranging from strongly agree - strongly disagree. As an illustration:

Problems/Factors	Mean values			Respondent's response		
	Micro	Small	Medium	Micro	Small	Medium
GOVPPROB1	4.82	3.42	1.90	SA	A	D

Table 7 summarises the responses of micro, small, and medium-level firms. The responses of micro-level enterprises are mostly categorized as "SA & A," while small-level companies exhibit responses categorized as "SA, A, N, & D." Medium-level enterprises, on the other hand, display responses categorized as "A, N, D, SD." These findings indicate that micro-enterprises encounter a greater number of challenges compared to small enterprises. Medium firms have fewer challenges in comparison to micro & small enterprises. Therefore, Hypothesis I “Financial difficulties substantially impact the micro firms within the MSME sphere.” and Hypothesis IV “The Micro firms in the MSME sector encounter maximum difficulty in harnessing the advantages of government programs.” are **accepted**. To determine the significance of these changes, further tests are conducted.

Variation in the degree of Financial and Government Initiatives issues/factors faced by MSMEs.

Kruskal-Wallis ANOVA test applied indicates p-value < 0.05, implying significant differences between Micro enterprises, Small enterprises, and Medium enterprises (MSMEs) on various issues.

Additionally, a paired Mann-Whitney U test is used to evaluate the variations among Micro-small units, Small-medium units, and Micro-medium units as depicted in Tables 8 and 9. The addition of all the issues faced by two specific groups was computed. Subsequently, the tests were administered with the use of the summated

output of the two specific groups. In all three examples, statistically significant differences are indicated by a p-value of less than 0.05. Here, Hypothesis II “There is a substantial variance among the financial difficulties encountered by the different forms of MSMEs under study.” and Hypothesis V “There exists a difference in difficulty level in the hurdles faced by the sample MSMEs when utilizing government programs.” are accepted.

Table 8 – Results of Mann Whitney U test on Financial problems of MSMEs.

Groups	Micro & Small	Small & medium	Micro & medium
N	326	145	255
Mann Whitney U	155.500	14.000	.000
Wilcoxon W	651.500	69.000	55.000
Asymptotic Sig. (2-sided test)	.000	.000	.000

Source: Author (Results of SPSS tool).

Table 9- Results of Mann Whitney U test on Government initiatives problems of MSMEs.

Groups	Micro & Small	Small & medium	Micro & medium
N	326	145	255
Mann Whitney U	210.500	21.000	2.000
Wilcoxon W	706.500	76.000	57.000
Asymptotic Sig. (2-sided test)	.000	.000	.000

Source: Author (Results of SPSS tool).

Ranking evaluation of Issues/factors faced by MSMEs

Table 10- Results of Friedman Rank test on Financial problems of MSMEs

Ranks

Formal financing	Mean Rank	Informal financing	Mean Rank	Internal financing	Mean Rank
FFiPROB1	6.68	INFFiPROB1	4.71	INTFiPROB1	4.72
FFiPROB2	6.30	INFFiPROB2	4.38	INTFiPROB2	4.37
FFiPROB3	6.12	INFFiPROB3	3.81	INTFiPROB3	3.98
FFiPROB4	5.56	INFFiPROB4	3.58	INTFiPROB4	3.55
FFiPROB5	5.07	INFFiPROB5	2.69	INTFiPROB5	2.38
FFiPROB6	5.57	INFFiPROB6	1.83	INTFiPROB6	1.99
FFiPROB7	3.28				
FFiPROB8	3.11				
FFiPROB9	3.31				

Test Statistics

N	363	N	363	N	363
Chi-Square	376.197	Chi-Square	260.555	Chi-Square	261.099
df	8	df	5	df	5
Asymp. Sig.	.000	Asymp. Sig.	.000	Asymp. Sig.	.000

Source: Author (Results of SPSS tool).

Table 11 Results of Friedman Rank test on Government Initiatives of MSMEs

Ranks

	Mean Rank
GOVPPROB1	5.38
GOVPPROB2	5.04
GOVPPROB3	4.65
GOVPPROB4	4.36
GOVPPROB5	3.50
GOVPPROB6	2.80
GOVPPROB7	2.27

Test Statistics	
N	363
Chi-Square	266.749
df	6
Asymp. Sig.	.000

Source: Author (Results of SPSS tool).

The ranking of issues assessed by the Friedman rank method as displayed in Table 10 and 11. Individual variables from the three financing groups—formal, informal, and internal—as well as variables of government initiatives are examined in this study in order to conduct a rank analysis. To find the mean rank, add up the rankings for every item and divide it by the total no. of observations. A higher ranking indicates superiority across all variables.

Formal finance (1>2>3>4>5>6), informal finance (1>2>3>4>5>6), internal finance (1>2>3>4>5>6), and government efforts (1>2>3>4>5>6) are ranked in the event of issues or factors. Issues with "Inadequate collateral security," "Tax reforms", and "Extensive paperwork processes" are the most significant in the realm of formal finance. "Insufficient financial literacy among proprietors" is the least prominent concern. "Inadequate collateral security", "high interest rate", "Large loan denials- insufficient legal documentation," are the most impactful problems with informal finance, and "Extended geographical separations are unfavourable," are the least identified. Problems with "Delay in the collection of debts," "High Bad debts," and "Short credit period by a creditor," are the most challenging aspects of internal finance and the least noticeable issue is, "Localized power failures increase in costing,". The most impactful issue with government initiatives is "Lack of knowledge on the scheme," then "Prolonged documentation and adherence to regulations," "Inadequate knowledge of application protocols," "digital divide" and lastly, "Divergent strategies between the federal and regional authorities," which is the least prominent concern. Here, Hypothesis III "There is a substantial variance in the rankings of several financial issues the sample enterprises face." and Hypothesis VI "There exists a substantial variance in level of challenges handled by MSMEs in relation to accessing & using various government programs." are accepted.

Examining the repayment strategies used by companies to settle their credit obligations

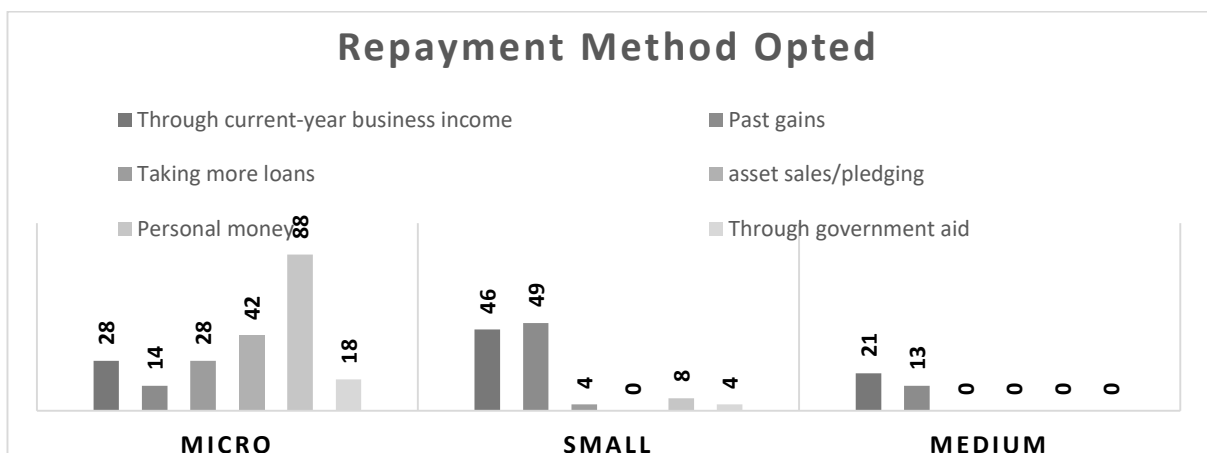


Figure 4: Various repayment method opted by MSMEs

Source: Author (data collection).

The bar graph illustrates the different repayment mechanisms used by MSMEs (**Figure 4**). For micro enterprises, the predominant means of repaying is taking more loans, then by sales & pledges of assets, and finally government aid. The most significant method of reimbursement for small & medium businesses is the use of current & past gains. Limited money affects repayment techniques, resulting in larger financing challenges for micro enterprises also seen in **Table 3** as compared to small & medium-sized organizations.

Current positions of the firms concerning certain government programs.

Table 12: Current positions of the firms towards certain government programs.

For below table- (Not eligible= NE; Not Applied= NA; Applied= A; Received= R; Denied= D; Unaware= U) & (Micro units: mi; Small-units: S; Medium-units: Me).

		NE	NA	A	R	D	U
		Mi S Me	Mi S Me	Mi S Me	Mi S Me	Mi S Me	Mi S Me
1	CGTMSE.	0 0 35	25 0 0	7 11 0	18 42 0	42 0 0	127 56 0
2	PMEGP	0 0 35	18 0 0	14 18 0	11 32 0	52 25 0	123 35 0
3	PMMY	0 0 0	0 0 0	18 7 4	74 81 25	32 0 0	92 21 9
4	2nd Loan PMEGP/MUDRA	0 0 0	0 0 0	25 32 4	28 25 14	42 11 0	123 42 17
5	ISO 9000/ISO 14000	0 0 0	0 0 0	14 14 0	11 11 0	25 11 14	166 76 21
6	CGSSD-Stressed MSME	0 0 0	0 0 0	18 0 0	95 74 28	28 0 0	78 35 7
7	Credit Facilitation-NSIC	0 0 0	0 0 0	18 18 14	28 11 7	48 4 0	123 78 14
	Total	0 0 70	43 0 0	114 100 22	265 276 74	269 51 14	832 343 68

Source: Author (data collection).

According to Table 12 Major factor in micro units is “inadequate knowledge about the policies” then by “refusal of officers” and then followed by “gaining advantage of the policies”. In this the “inadequate knowledge” shows greater than 50% which evaluates the significant issue is inadequate knowledge among the respondents. Seeing the ranks also the same is ranked as major variable for problems in schemes.

For small businesses, “inadequate knowledge about the policies” and “gaining advantage of the policies” rank highest, respectively. It may be argued that inadequate knowledge is once again at play here, but in contrast to micro firms, “refusal of officers” is not a problem. In comparison to micro-enterprises, small businesses are better off.

The most important issue for medium-sized businesses is whether they have “reaped gaining advantage of the policies,” while “Inadequate knowledge” ranks second. When compared to MSMEs, the “unawareness factor” is lower in this context. In addition, the rate of accounts receivable is rather high.

Association between financial issues and governmental programs

Table 13 – Results of Spearman’s Rank correlation in finance & government composite

		Finance composite	Government composite
Spearman's rho	Correlation Coefficient	1.000	.910**
	Sig. (2-tailed)	.	.000
	N	363	363
	Correlation Coefficient	.910**	1.000
	Sig. (2-tailed)	.000	.
	N	363	363

Source: Author (Results of SPSS tool).

Spearman's rank correlation analysed finance concerns and government efforts in Table 13. Based on the highlighted issues, 2 composite scores are initially generated for this examination: one related to financial concerns and another for challenges in obtaining government policies. According to the statistics provided above, the correlation coefficient, which quantifies the forte & trend of the connection, is 0.91. Additionally, the

value of p is less than 0.01, suggesting a strong association between the variables. There is a sturdy constructive connection among them. Due to the substantial obstacle of funding for MSMEs, they rely on initiatives of government as a remedy, yet the problems persist. Here Hypothesis VII “There exists a substantial correlation between issues of finance and challenges in execution and access to government programs by MSMEs.” is accepted.

Conclusion

India's economy significantly depends on MSMEs, which are essential for driving economic growth through manufacturing, exports, job creation, and innovation. However, these enterprises face numerous challenges that impede their growth and sustainability. The present study examines the MSMEs in the state of Gujarat to assess the financial issues and difficulties faced by them in accessing the benefits of government initiatives and programs. The issues and factors affecting the same were identified through primary data collected via questionnaires from 363 MSMEs across five districts in Gujarat, India.

It is observed that tax reforms and Section 43B(h) of the Finance Act 2023, limited access to formal credit due to strict criteria of financial institutions, high collateral demands, difficulty in loan application due to lack of financial literacy, and working capital management, hinder MSME growth. Despite numerous policies and schemes from the Government and the RBI, the MSME sector continues to struggle with accessing timely and adequate financing. Both entrepreneurs and bankers face challenges that contribute to this issue. In the context of Digital India and Atmanirbhar Bharat, many innovative small start-ups in the manufacturing and service sector require risk capital and timely credit. Although many enterprises are becoming financially distressed, the rate of NPAs in this sector is lower than that of larger enterprises, which should be taken into account by banks while providing funding to MSMEs. (Mund, 2020)[23]. Kromidha, Yadav, and Ilavarasan (2023)[11] discovered that the success of projects is more heavily influenced by external environmental factors than by the specific characteristics of the projects themselves. This holds true even when there is a digital and social disconnect between borrowers and their funders. The government should also encourage women entrepreneurs in MSMEs. The Government must implement reforms in policies and regulations to better support MSMEs and should ensure that these programs are reaching and utilized by MSMEs.

The government formulates policies to tackle financial issues, but these schemes are inaccessible due to various factors, including limited awareness, cumbersome paperwork, inadequate understanding of the schemes, digital divide in rural areas, restrictions on eligibility and funding, the need to register as MSMEs, a higher likelihood of refusal, low financial literacy and competition from state and central programs. These industries should register themselves in the portal under the proper head and follow established norms and standardized practices to operate more effectively and face local as well as global competition, they should be digitally connected to be aware of and take advantage of various government schemes. Furthermore, MSMEs should collaborate with larger firms to introduce competitive products to the market.

Suggestions and Recommendations (Figure 5)

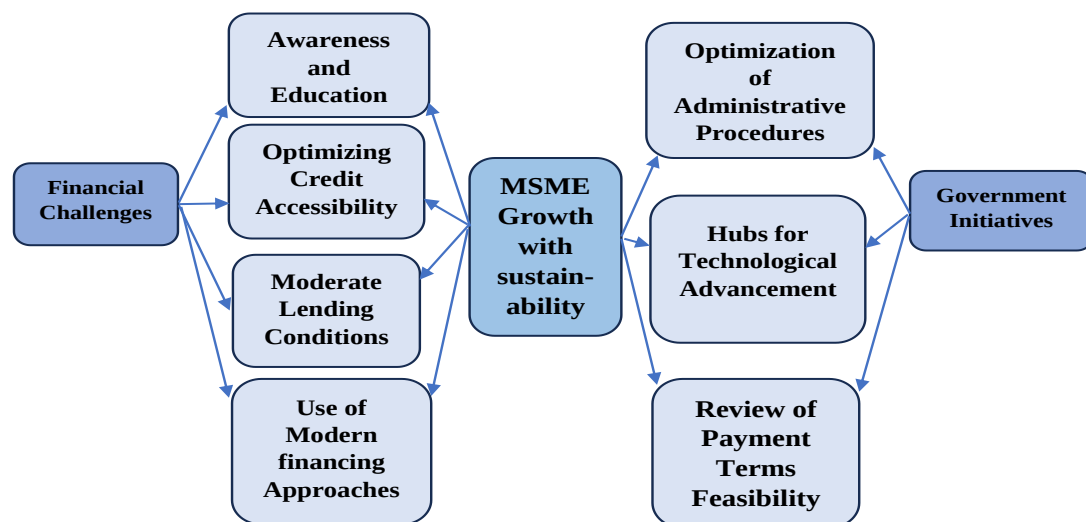


Figure 5: Framework for MSMEs growth.
Source: Author

Strategies for MSMEs to overcome financial challenges

- **Awareness and Education Campaigns:** Develop and execute focused financial literacy initiatives to educate MSMEs on the numerous financial products and services that are accessible. This encompasses comprehending repayment conditions, interest rates, and the significance of sustaining favourable credit ratings. Engage in partnerships with financial institutions and fintech businesses to provide workshops and seminars that specifically target the acquisition of practical financial management skills and the effective use of digital financial instruments.
- **Optimizing Credit Accessibility:** Simplify the loan application procedure to enhance its accessibility for MSMEs. Promote the use of financial technology platforms that provide alternative credit scoring models, which utilize non-conventional data sources to evaluate creditworthiness. This can assist MSMEs with restricted credit histories in obtaining essential funding.
- **Moderate Lending Conditions:** Promote credit providers to give more advantageous loan conditions to MSMEs. Develop precise criteria for lenders to evaluate MSME loan applications, emphasising the reduction of collateral requirements and the provision of competitive interest rates. Implement risk-sharing structures, such as the Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE), to lower perceived risks.
- **Use of Modern financing Approaches:** MSMEs should adopt modern financial methodologies to enhance growth and resilience. Key strategies include using digital tools for cash flow management, exploring alternative financing options like crowdfunding, and implementing robust financial planning. These methodologies optimize financial performance and help MSMEs adapt to market changes, ensuring sustainable growth (Mittal et.al., 2024)[21].

Strategies for MSMEs to address gaps in Government Initiatives/schemes of MSMEs

- **Optimization of Administrative Procedures:** Streamlining the registration and compliance procedures for MSMEs in order to alleviate administrative workloads is needed. To guarantee convenient access to registration and compliance information, it is essential to consistently update the MSME site. This entails including feedback systems to facilitate ongoing improvement.
- **Hubs for Technological Advancement:** Create technology centres to facilitate the adoption of advanced manufacturing technologies by MSMEs. Establish district-level facilities furnished with technologies such as 3D printing to provide MSMEs access to cutting-edge manufacturing methods which can benefit in more profitable business alternatively increasing finance by optimizing product quality and saving manufacturing expenses (Argade & Mazumdar, 2023)[1].
- **Review of Payment Terms Feasibility:** Reassess the 45-day payment criteria to guarantee prompt payments to MSMEs. Enforce more stringent sanctions for late payments and encourage the use of digital platforms such as TReDS (Trade Receivables Discounting System) to expedite payment processing.
- The use of these pragmatic and precise measures enables MSMEs to effectively manage financial obstacles and use government programs to promote development and long-term viability.

Reference:

- Argade, N. & Mazumdar, H., (2023).** '3D Printing: a game changer for Indian MSME sector in industry 4.0.' In Springer eBooks, pp. 295–329. Available from: https://doi.org/10.1007/978-3-031-20443-2_14
- Avendus. (2023b),** MSME lending landscape in India. (pp. 1–8) [Report]. Available from: https://www.avendus.com/encrypted_pdf_path/msme-lending-report-formattedvf-img-642a719b97ccc-.pdf
- Banerjee, B.L. (2023).** Challenges and Opportunities for Micro, Small, and Medium Enterprises: Navigating the Business Landscape. *The American Journal of Interdisciplinary Innovations and Research*, 05(05): 13–17. Available from: <https://doi.org/10.37547/tajir/volume05issue05-04>
- Bekele, E. & Worku, Z. (2008).** Factors that Affect the Long-Term Survival of Micro, Small and Medium Enterprises in Ethiopia. *South African Journal of Economics/South African Journal of Economics*, 76(3): 548–568. Available from: <https://doi.org/10.1111/j.1813-6982.2008.00207.x>
- Das, K (2008),** 'Micro Small Medium Enterprises in India: Unfair Trade'. Proceedings of GIDR- Gujarat Institute of Development Research Working Paper Series, Gujarat.
- Dash, P., Ranjan, R., and Task Force 5 (2023).** Addressing MSMEs' Financing Challenges Through G20 Action,' T20 Policy Brief. Available from: https://www.global-solutions-initiative.org/wp-content/uploads/2023/12/T20_PB_TF5_6_Addressing_MSMEs_Financing_Challenges_Through_G20_Action.pdf.
- Hakeem, M.M. (2019).** Innovative solutions to tap “Micro, Small and Medium Enterprises” (MSME) market. *Islamic Economic Studies - I.R.T.I.*, 27(1): 38–52. Available from: <https://doi.org/10.1108/ies-05-2019-0002>
- Hughes, A. (1997).** Finance for SMEs: A U.K. Perspective. *Small Business Economics*, 9(2): 151–166. Available from: <https://www.jstor.org/stable/40228637>
- Jaiswal, S.S. (2014).** Problems and Prospects of Micro, Small and Medium Enterprises (MSMEs) in India. *International Journal of Innovative Research and Studies*, 11(2): 45-52.
- Khurana, S., Haleem, A., Luthra, S. & Mannan, B. (2021).** Evaluating critical factors to implement sustainable oriented innovation practices: An analysis of micro, small, and medium manufacturing enterprises. *Journal of Cleaner Production*, 285: 125-377. Available from: <https://doi.org/10.1016/j.jclepro.2020.125377>
- Kromidha, E., Yadav, N., & Ilavarasan, P.V. (2023).** Digital Microfinance Crowdfunding for Women Entrepreneurs in India. *International Journal of Entrepreneurship and Small Business*, 2023, 50(4): 459 – 481. Available from: <http://doi.org/10.1504/IJESB.2023.134687>
- Lakuma, C.P., Marty, R. & Muhumuza, F. (2019).** Financial inclusion and micro, small, and medium enterprises (MSMEs) growth in Uganda. *Journal of Innovation and Entrepreneurship*, 8(15). Available from: <https://doi.org/10.1186/s13731-019-0110-2>.
- Le, L.H., Vo, A.H., Nguyen, D.T. & Duong, G.H. (2024).** How do SMEs' strategies change under the impacts of a critical external shock? The case of Vietnamese SMEs under the COVID-19 pandemic. *International Journal of Entrepreneurship and Small Business*, 52(3): 352 – 378. Available from: <http://doi.org/10.1504/IJESB.2024.138772>
- Suguna M., Bhavin S., Sivakami B. U., & Suresh M. (2022).** Factors affecting repurposing operations in Micro Small and Medium Enterprises during Covid-19 emergency. *Operations Management Research: Advancing Practice Through Research*, 15(3–4): 1181–1197. Available from: <https://doi.org/10.1007/s12063-022-00253-z>
- Mahesh K. M., Aithal P. S. & Sharma K. R. S., (2023).** Government initiatives and digital innovation for Atma Nirbhar MSMEs/SMEs: To Achieve Sustainable and Inclusive Economic Growth. *International Journal of Management, Technology, and Social Sciences*, 8(1): 68-82. Available from: <https://doi.org/10.5281/zenodo.7583000>
- Majumdar, M. & Sengupta, S. (2010).** Declining Registration by Small Manufacturing Units: A Case Study of Durgapur. *Economic and Political Weekly*, 45(25): 64–72. Available from: <https://www.jstor.org/stable/40736669>

Maksum, I.R., Rahayu, A. & Kusumawardhani, D. (2020). A social enterprise approach to empowering micro, small and medium enterprises (SMEs) in Indonesia. *Journal of Open Innovation*, 6(3): 50-58. Available from: <https://doi.org/10.3390/joitmc6030050>

Malhotra, M., Chen, Y., Criscuolo, A., Fan, Q., Hamel, I.I & Savchenko, Y. (2007), Expanding access to finance, The World Bank eBooks. Available from: <https://doi.org/10.1596/978-0-8213-7177-0>

Ministry of Micro, Small & Medium Enterprises. Available from: <https://msme.gov.in/>

Ministry of MSME, Government of India (22-23). Annual report 2022-23: MSMEs. Government of India. Available from: <https://msme.gov.in/sites/default/files/MSMEANNUALREPORT2022-23ENGLISH.pdf>

Mittal, V., Raman, T.V. & Bhardwaj, G.N. (2024), Financing Preferences and Decisions - The Case of Entrepreneurs of Micro, Small and Medium Enterprises. *International Journal of Business Excellence* (Print), 32(3): 296–319. Available from: <https://doi.org/10.1504/ijbex.2024.137254>

Mukherjee, S. (2018). Challenges to Indian micro small scale and medium enterprises in the era of globalization. *Journal of Global Entrepreneurship Research*, 8(1). Available from: <https://doi.org/10.1186/s40497-018-0115-5>

Mund, C.S. (2020). Problems of MSME Finance in India and Role of Credit Guarantee Fund Trust for Micro and Small Enterprises. *Journal of Economics and Finance*, 11(4):1-6.

Naretto, N., (2002), Government support for small and medium-size enterprise's clusters in Brazil. Doctoral dissertation, The George Washington University.

Patnaik, C. Satpathy, I. & Rachayeeta, P. (2016). Issues of Micro, Small and Medium Enterprises (MSME) in India. *International Journal of Innovative Research and Development*, 5(6): 1-5.

Sahu, T.N., Agarwala, V. & Maity, S. (2023). Social welfare through Mudra Yojana: how did the public sector banks perform in realizing the dream. *International Journal of Business Excellence*, 31(3): 450–467. Available from: <https://doi.org/10.1504/ijbex.2023.134850>

Sarmah, A. and Saikia, B. (2023). Business challenges of the nascent and mature micro small and medium enterprises (MSMEs): a comparative analysis from India. *Journal of Global Entrepreneurship Research*, 13(1). <https://doi.org/10.1007/s40497-023-00364-2>.

Sharma, P. & Sharma, R. (2024). The Financial Gap in MSME Sector: A Review of Literature for the Period of 2014 to 2023. *Educational Administration: Theory and Practice*, 30(5): 3120–3127. Available from: <https://doi.org/10.53555/kuey.v30i5.3396>.

Shukla, M. & Shankar, R. (2024). Analyzing critical success factors for smart manufacturing system adoption in Indian SMEs. *International Journal of Business Excellence*, 32(4): 522–544. Available from: <https://doi.org/10.1504/ijbex.2024.137572>

State wise Udyam registration. Available from: https://dashboard.msme.gov.in/Udyam_Statewise.aspx

Stein, P. Pinar, A. O. & Martin, H. (2013). 'Closing the credit gap for formal and informal micro, small, and medium enterprises.' *Proceedings of International Financial Corporation*. Available from: <http://hdl.handle.net/10986/21728>

Utomo, N.B. (2024). The effect of financial support, creativity, and regulatory environment on the growth of MSMEs. *International Journal of Integrative Sciences*, 3(9): 1007–1018. Available from: <https://doi.org/10.55927/ijis.v3i9.11643>.

Wasiuzzaman, S. (2018). Determinants of liquidity in Malaysian SMEs: a quantile regression approach. *The International Journal of Productivity and Performance Management*, 67(9): 1566–1584. Available from: <https://doi.org/10.1108/ijppm-12-2017-0354>

Zindiye, S. Chiliya, N. & Masocha, R. (2012). The impact of Government and other Institutions' support on the Performance of Small and Medium Enterprises in the Manufacturing Sector in Harare, Zimbabwe. *International Journal of Business Management and Economic Resource*, 3(6): 655–667.

Influence of Personality Traits of Celebrity Endorsers on Buying Decisions of Gen-Z Girls: A Study

Mr. Nandita Dey
Ph.D. Research Scholar,
Department of Commerce,
Assam University, Silchar,
Assam, India

Dr. Kingshuk Adhikari
Associate Professor,
Department of Commerce,
Assam University, Silchar,
Assam, India

Dr. Dinesh Kumar Pandiya
Former Professor, Department
of Commerce, Assam
University, Silchar, Assam,
India

Abstract

The significance of celebrity endorsement for advertisements and brands cannot be underestimated. In order to encourage consumers to choose a specific brand over other options, the marketing attributes and imagery of the brand are complemented by celebrities. The study targets to identify the various personality traits of celebrities endorsing beauty and cosmetic products and to compare how these select personality traits of celebrity endorsers influence the buying decisions of Generation-Z girls in Silchar town of Assam. To perform the study, 330 girl students attending government-funded colleges in Silchar town were surveyed using the convenience sampling technique. The findings reveal that the traits Trustworthiness, and Expertise of celebrities influence the buying decision of Gen-Z girl students under consideration.

Keywords: Attractiveness, Cosmetic Product, Extraversion, Marketing, Trustworthiness

JEL CODE: M3, M30, M31, M37

Introduction

The popularity and acceptance of cosmetic industries in India are largely due to their beauty and skin care products (Banerjee, 2014). Various Indian brands create a huge presence in both domestic and global markets (Akwasi, 2014). Some big branded cosmetic companies are Mac, Huda Beauty, L'Oreal, Lakme, Lotus, Pac, Faces Canada, Maybelline New York, Sugar and so on. Similarly, there are enormous smaller brands like Colorbar, Forest Essentials, Kay Beauty, Charmacy, Coloressence, Plum, MyGlamm, etc. that also perform well in the domestic market. The increase in consciousness about appearing more beautiful and handsome among both women and men has resulted in the inclusion of diverse types of cosmetic products, including skin care, hair care, fragrances, make-up and more (Kwan et al., 2019). This indicates a significant increase in the cosmetic industry in India (Serban, 2020). This growth has been extreme in the past few years (Alsmadi, 2006). Many cosmetic industries have proven their efficiency in emerging markets throughout the world (Fatima and Lodhi, 2015). Likewise, the rapid launch of new products in this industry is adding some more fuel to the growth of cosmetic industries (Horsky and Simon, 1983). The interest of every individual in grooming and beauty is the reason why the cosmetic industries have grown so much (Bechan and Hoque, 2016). The cosmetic industry in India is highly competitive, with challenges coming from both domestic and foreign brands (Thakur, 2020). Due to the high competition in cosmetic products, it becomes extremely challenging to establish a special place in the minds of consumers (Fatima and Lodhi, 2015). Marketers are employing various tactics to expand their sales and attract more consumers (Singh and Banerjee, 2018).

In India, advertising products and services with the help of celebrities or famous personalities is considered to be the most effective and useful strategy (Anandarajan and Sivagami, 2016). As these celebrities are seen as idols by today's youth because of their social status and fame (Erdogan, 1999). These celebrities' lifestyles, including their clothing and physical appearance, are often imitated by Generation-Z (Ibitayo & Tejumaiye, 2015; Fauzee and Dada, 2021). When celebrities (such as movie stars, players and social media influencers) act as the brand's spokesperson and validate the brand's claims and position by entrusting their personality, popularity, stature in society or expertise in the field, it is known as celebrity endorsement or celebrity branding (Zipporah & Mberia, 2014). Endorsement from such celebrities is not only effective as it captures the attention of the targeted audience and creates a long-lasting memory in the minds of the consumers (Desai, 2014), but it also influences them to purchase the products being endorsed (Ibitayo & Tejumaiye, 2015). Companies spend enormous amounts of money on celebrities to endorse their products in the hope that such endorsements will influence favourable attitudes towards the brand (Khalid & Siddiqui, 2018; Alsmadi, 2006), ultimately resulting in increased sales and profits (Atkin and Block, 1983). The process of choosing celebrities to endorse cosmetic products is a delicate task (Mazzini et al., 2014). Different factors (such as celebrity-brand match-up, popularity, loyalty, past history of celebrity, controversies, etc.) need to be considered while selecting celebrities as endorsers (Breen et al., 2003; Maran & Rani, 2013). Personality traits of celebrities are one of those factors that play a significant role in endorsing cosmetic products (Majeed et al., 2020). Therefore, the present study is

designed to analyse the amount to which celebrity personality traits, such as Expertise, Extraversion, Physical Attractiveness and Trustworthiness, are influencing the buying decisions of cosmetic products among Generation-Z girls' students of four government-funded colleges at Silchar town of Assam, India.

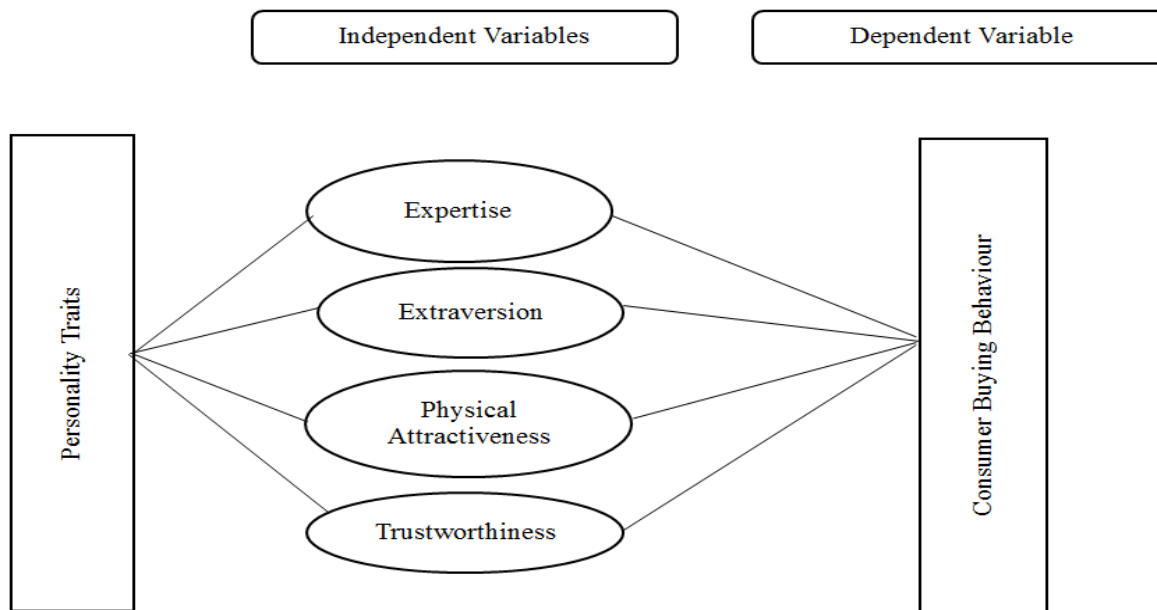


Figure 1: Conceptual Framework showing the influence of Personality Traits on Consumer Purchasing Behaviour Source: Developed by Researchers

Review of Literature

Endorsement is a method of brand communication in which a celebrity serves as the brand spokesperson and validates the brand's claims and position by utilizing their name, personality, popularity, status in society to endorse the brand (Fleck et al., 2014). Celebrity endorsement is the most prevalent technique of advertising today. Advertisers can use celebrities to attract and charm their audience by stimulating their buying behaviour. In India, where Bollywood stars, cricketers, and social media influencers are adored, advertisers perceive this obsession as a chance to expand their markets and promote their brands (Bansal, 2023). McCracken (1989) stated that Celebrity endorsement is used to improve a product's image by transferring the symbolism of the celebrity to it. Different categories of celebrities are employed as endorsers for marketing campaigns. The majority of celebrities come from Bollywood and sports industries because their popularity reaches a wider audience. Bollywood stars are commonly employed as endorsers and have been the dominant players in all product categories (Abdussalam and Johnson, 2016). The purchase intentions of consumers can be greatly impacted by celebrity endorsements for a product or service. Such feelings have made it necessary to identify the specific qualities of celebrities that have the most positive impact on an advertiser's target audience (Willing and Fruchter, 2013). In India, TV commercials are highly appealing to young people, particularly teenage girls, who tend to purchase the products featured in those commercials (Vyas & Parmar, 2019). Baker and Churchill, (1977) stated that advertisements featuring models are more preferred by viewers who have a high preference for commercials than viewers who don't have a high preference for advertisements featuring models. Individuals who are fond of commercials tend to retain more information about brands and celebrities, but there is no distinction between those who do and those who do not have the desire to recall information presented in commercials. To get the most out of celebrity endorsements on Gen-Z consumers, businesses should ensure that their partners are selected carefully and their campaigns are relatable (Satria et al., 2019). To be successful in a consumer-oriented market, a service provider needs to employ a psychological approach to attract consumers. Acknowledging the influencing factors may lead to improve things and achieve consumer satisfaction. Successful market outcomes can be achieved by studying consumer buying behaviour (Chandan, 2019). Rojhe and Hosaini, (2020) stated that there are four primary factors that affect consumers' buying behaviour, including personal, psychological, social and economic factors. Therefore, understanding consumers' behaviour is one of the most difficult and challenging tasks for marketers. Marketing experts have recognized the significant positive impact of celebrities on influencing consumer buying behaviour. Celebrities are able to change consumer attitudes, expand purchasing intentions and increase profits. So, it is important to select the right celebrity for the right company. Using a celebrity with unique characteristics that can truly affect consumers'

buying behaviour is crucial for grabbing consumers' attention and interest among similar advertisements (Adam and Hussain, 2017).

During the review of existing literature, it was observed that although perception-based studies on celebrity endorsement have been conducted from various viewpoints and encompassed different expectations, very few studies have been conducted on the personality traits of celebrities who endorse beauty and cosmetic products. Furthermore, no research has been conducted in the eight states of North-East India related to the subject of this study so far. So, it is possible that this gap will be addressed by this research work, and it could be viewed as a groundbreaking work on the subject in the North-Eastern states of India.

Table 1: Select Personality Traits of Celebrity Endorsers

Traits	Authors
Physical Attractiveness	Araabi, Hickman and McClymont (2022), Britton and Marie (2012), Baranczuk (2019),
Expertise	Dolan (2017), O'Neill (2002), Dimitrov and Kroumpouzos (2023)
Extraversion	Baranczuk (2021), Widiger and Crego (2019)
Trustworthiness	O'Doherty (2022), O'Neill (2002), Dimitrov and Kroumpouzos (2023)

Source: Extracted from Literature

Need of the Study

In this study, the authors aim to analyse the influence of celebrity personality traits on the buying decision of consumers regarding various categories of cosmetic products. The study will analyse the perception of young female college students, identified as Generation Z, based on their selected personal backgrounds. As marketers allocate a significant amount of funds towards this marketing strategy, known as celebrity endorsement, the purpose of this study is to analyse whether this strategy is genuinely effective or not.

Objectives of the Study

- To compare how the personality traits of celebrity endorsers influence Generation-Z Girls in buying decision of cosmetic products based on their colleges.
- To compare how the personality traits of celebrity endorsers influence Generation-Z Girls in buying decision of cosmetic products based on their streams.
- To compare how the personality traits of celebrity endorsers influence Generation-Z Girls in buying decision of cosmetic products based on their monthly family income.

Hypotheses of the Study

- Celebrities' personality traits have no influence on Generation-Z girls in buying decision of cosmetics products based on their colleges.
- Celebrities' personality traits have no influence on Generation-Z girls in buying decision of cosmetics products based on their streams.
- Celebrities' personality traits have no influence on Generation-Z girls in buying decision of cosmetics products based on their monthly family income.

Research Methodology

The present study is descriptive in nature. The population of the study is 3782 Generation-Z girl students of four government-funded colleges i.e., Cachar College, Gurucharan College, Radhamadhab College, and Women's College at Silchar, Assam. Using Yamane (1967) formula, the sample size has been initially decided at 362 with a confidence interval of 5%. However, after a scrutiny of the responses, it has been found that some of the questionnaires are not completely filled up and some important information is missing. After rejecting those responses, the final sample size for the present study is 330. The convenience sampling technique is used for the study. The respondents' opinions have been collected through a well-structured questionnaire with five-point Likert type scale. Statistical tools, such as mean and standard deviation have been used. Since the data set does not follow normal distribution, non-parametric approach has been adopted and accordingly Kruskal Wallis Test has been employed.

Table 2: Profile of the Respondents

Variables	Distribution	Frequency	Percentage
College	Cachar College	83	25.15
	Gurucharan College	83	25.15
	Radhamadhab College	82	24.85
	Women's College	82	24.85
Stream in Under-graduation	Arts	110	33.33
	Commerce	110	33.33
	Science	110	33.33
Monthly Family Income (in Rupees)	Up to 40,000	103	31.21
	40,001 to 80,000	217	65.76
	80,001 and above	10	3.03

Source: Field Survey

Scope of the Study

- The respondents' responses are based on their personal experiences.
- The present study relies on the opinion of college-going girl students at Silchar town, Assam.

Results and Discussions

In this section, the influence of celebrities' personality traits on buying decisions of cosmetic products has been analysed.

Table 3: Influence of Celebrities' Personality Traits on Buying Decision according to Respondents College

Traits	College								Kruskal Wallis Test	
	Cachar College		Gurucharan College		Radhamadhab College		Women's College			
	Mean Score	SD	Mean Score	SD	Mean Score	SD	Mean Score	SD	Chi-square	p-value
Physical Attractiveness	2.92	1.25	2.32	1.14	1.89	1.18	2.38	1.16	11.561	.006
Expertise	2.98	1.10	1.92	1.27	1.90	1.23	3.12	2.17	7.618	.034
Extraversion	1.76	1.26	2.02	1.25	1.80	1.32	3.37	2.22	2.149	.657
Trustworthiness	1.88	1.18	2.73	1.27	2.71	1.17	2.71	1.27	1.269	.736

Source: Field survey

Table 3 shows the respondents' perceptions across their colleges. The purchase decisions of Generation-Z girls attending Cachar College are influenced by 'Physical Attractiveness' of celebrities. 'Expertise' and 'Extraversion' of celebrity endorsers influence the buying decision of girls enrolled in Women's College. The 'Trustworthiness' of celebrity endorsers influences the buying decisions of girl students belonging to Gurucharan College the most out of all the respondents categorized under four different colleges. The computed value of chi-square and its corresponding p-value clearly depicts that there is no statistically significant influence of the select personality traits of celebrities on the purchasing decision of Generation-Z girls.

Table 4 shows the respondents' perceptions across their stream of education. In this scenario, the purchase decisions of generation-Z girls enrolled in the Science stream are influenced by 'Physical Attractiveness' and 'Trustworthiness' of celebrities. Whereas, 'Expertise' and 'Extraversion' play a major role in the buying choices of female students who are enrolled in the commerce stream at different colleges in Silchar town.

Table 4: Influence of Celebrities' Personality Traits on Buying Decision according to Respondents Stream

Traits	Stream						Kruskal Test	Wallis
	Arts		Commerce		Science			
	Mean Score	SD	Mean Score	SD	Mean Score	SD	Chi-square	p-value
Physical Attractiveness	2.13	1.06	2.22	1.08	2.87	1.14	.658	.609
Expertise	3.16	2.08	3.83	2.05	1.87	1.31	3.343	.065
Extraversion	2.17	1.17	3.76	2.29	1.89	1.06	4.707	.061
Trustworthiness	2.73	1.10	2.74	1.26	2.88	1.39	.406	.816

Source: Field survey

The computed value of chi-square and its corresponding p-value Clearly depicts that there is no statistically significant influence of the select personality traits of celebrities on the purchasing decision of consumers.

Table 5: Influence of the Personality Traits of Celebrities in Buying Decision of Cosmetic Products according to Respondents Monthly Family Income

Traits	Monthly family income (in Rupees)						Kruskal Test	Wallis Test
	Up to 40,000		40,001 to 80,000		80,001 and above			
	Mean Score	SD	Mean Score	SD	Mean Score	SD	Chi-square	p-value
Physical Attractiveness	2.13	2.11	2.22	2.08	2.31	1.11	.658	.719
Expertise	2.17	1.43	1.83	1.03	1.86	1.02	3.343	.114
Extraversion	1.28	1.19	3.07	2.37	1.76	1.03	4.707	.062
Trustworthiness	2.73	1.10	2.74	1.26	2.88	1.39	.406	.816

Source: Field survey

Table 5 shows the respondents' perceptions across their monthly family income. In this scenario, the purchasing decisions of girls with monthly family income of Rs. 80,000 and above are influenced by 'Physical Attractiveness' and 'Trustworthiness' of celebrity endorsers. On the other hand, the 'Expertise' and 'Extraversion' of celebrity endorsers highly influence the purchasing decisions of Generation-Z girls with a monthly family income of up to Rs. 40,000 and Rs. 40,001 to Rs. 80,000 respectively. The computed value of chi-square and its corresponding p-value Clearly shows that there is no statistically significant influence of the select personality traits of celebrity endorsers and purchasing decision of Generation-Z girls.

Summary of Key Findings

- The study reveals that the physical attractiveness and expertise of celebrities have a significant influence on the buying decision of cosmetics products by Generation-Z girls across the colleges selected for the study. However other personality traits of celebrities considered in this study have no significant influence on the buying decision of cosmetics products by Generation-Z girls across the colleges under consideration.
- The study reveals that the personality traits of celebrities have no significant influence on the buying decision of cosmetics products by Generation-Z girls across the stream of education. This implies that there is no divergent response of Generation-Z girls hailing from Art, Science and Commerce backgrounds.

- The study reveals that the personality traits of celebrities have no significant influence on the buying decision of cosmetics products by Generation-Z girls across their monthly family income. This implies that the response of Generation-Z girls hailing from different economic background by and large move in the similar direction.

Recommendation and Conclusion

In India, celebrity endorsements are now a common strategy for marketers to endorse products or services. The present study focuses on the influence of celebrity endorsers' personality traits on consumer purchasing decisions. After conducting the study, it is recommended that before making any endorsement related to cosmetic products, the company must give a careful thought and conduct adequate research. Companies need to be aware of the preferences and purchasing habits of their intended clients. In order to capture the attention and interest of the target market, advertising agencies must hire appropriate celebrity endorsers, keeping the personality traits of the celebrity in mind.

It has been concluded that their personalities have a considerable impact on the decision-making process of Generation-Z girls. Personality traits such as physical Attractiveness, Expertise, Extraversion, and Trustworthiness of celebrity endorsers all have a significant influence on the consumers buying decisions. Cosmetic products can be perceived as more trustworthy and credible when celebrities endorse them. Gen-Z girls hold the belief that if celebrities they adore have agreed to associate their name and image with a certain brand, the product needs to be trusted and of superior quality. Therefore, marketers should employ celebrities who possess the skills to present the product in a way that can entice their targeted consumers and increase the sales of cosmetic products.

Implications of the Study

The findings of the study can assist marketers in understanding Generation-Z girls' reactions to celebrity endorsements and identifying which personality traits of celebrity endorsers of cosmetic products genuinely influence the buying decisions of Generation-Z girls. Understanding the influence of celebrity personality traits on Generation-Z consumers can assist cosmetic companies in predicting consumer behaviour and preferences, thereby enabling these companies to create more effective advertising campaigns. The study will additionally serve as a foundation for future research examining the influence of celebrity's personality traits on consumer buying behaviour in various industries or contexts.

Limitations of the Study

- The study relies on consumer responses and purchasing decisions that may change over time.
- The study incorporated a specific gender, sample size, and area, its findings cannot be applied to the entire Gen-Z populations.

Scope for Future Study

Celebrity endorsement is a highly controversial and diverse topic. Single research would not be able to provide comprehensive findings. Hence, there is always a room for more research. As the study is focused only consumers who are college going girl students, also considered as Gen-Z; future research can be undertaken targeting consumer from different occupations and age groups, which would probably bring to light different perceptions regarding the topic in hand. Also, the study is limited to only cosmetic products, therefore future studies should attempt to examine broader areas across different categories of products and services. While celebrity endorsements can be influential, but they are not the only factor that influences Gen-Z girls' purchasing habits. The significance of factors like price, quality, quantity, brand reputation and ethical considerations cannot be overstated. Therefore, in order to achieve long-term success, marketers must ensure that the products they endorse matches the value and preference of Generation-Z girls.

Reference:

- Abdussalam, P. K. & Johnson, B. (2016).** Celebrity endorsement in India: Pattern and trends. *Indian Journal of Commerce and Management Studies*, 7(2): 19-24.
- Adam, M. A. & Hussain, N. (2017).** Impact of celebrity endorsement on consumers buying behaviour. *British Journal of Marketing Studies*, 5(3): 79-121.
- Akwasi, A., (2014).** Effects of advertising on consumer buying behaviour with reference to demand for cosmetic products in Bangalore, India. *New Media and Mass Communication*, 27: 22-37.
- Alsmadi, S., (2006).** The power of celebrity endorsement in brand choice behavior: An empirical study of consumer attitudes in Jordan. *Journal of Accounting-Business & Management*, 13: 69-84.
- Anandarajan, S. & Sivagami, T. (2016).** Consumer purchase decision behaviour towards cosmetics marketing. *Asia Specific Journal of Research*, 1(37): 144-149.
- Araabi, H.F., Hickman, H. & McClymont, K. (2022).** On beauty. *Planning Theory and Practice*, 23(4): 601-633.
- Atkin, C. & Block, M. P. (1983).** Effectiveness of celebrity endorsers. *Journal of Advertising Research*, 23(1):57-61.
- Baker, M. & Churchill, G. A. (1977).** The impact of physical attractiveness models on advertising evaluations. *Journal of Marketing Research*, 14(4): 538-555.
- Banerjee, S., (2014).** Brand loyalty - influencing consumer buying behaviour. *Educed Global Management Research*, 1(1): 22-26.
- Bansal, N., (2023).** A study on gen z consumer perception towards celebrity endorsement and its impact on brand building. *International Journal of Multidisciplinary Research*, 5(4): 1-14.
- Baranczuk, U., (2019).** The five factor model of personality and sense of coherence: A meta-analysis. *Journal of Health Psychology*, 26(1): 12-25.
- Baranczuk, U., (2021).** The five-factor model of personality and generalized self efficacy: A meta-analysis. *Journal of Individual Differences*, 42(4): 183-193.
- Bechan, K. & Hoque, M. E. (2016).** Influence of income growth on purchasing patterns of luxury cosmetic products. *International Journal in Management and Social Sciences*, 3(7): 25-34.
- Breen, S., Whitehead, M. & Byrne, A. (2003).** The naked truth of celebrity endorsement. *British Food Journal*, 15(4/5): 288-296.
- Britton, A. & Marie, A. (2012).** The beauty industry's influence on women in society. *Honors Theses and Capstones*, 86: 4-40.
- Chandan, A., (2019).** Factors affecting consumer buying behaviour. *International Journal of Advanced Research*, 7(1): 563-568.
- Desai, K., (2014).** A study of consumer buying behavior of cosmetic products in Kolhapur. *Reviews of Literature*, 1(10).
- Dimitrov, D. & Kroumpouzos, G. (2023).** Beauty perception: A historical and contemporary review. *Clinics in Dermatology*, 41(1): 33-40.
- Dolan, R., (2017).** Effective presentation skills. *FEMS Microbiology Letters*, 364(24).
- Erdogan, B. J., (1999).** Celebrity endorsement: A literature review. *Journal of Marketing Management*, 15(4): 291-314.
- Fatima, S. & Lodhi, S. (2015).** Impact of advertising on buying behaviour of the consumers: Study of cosmetic industry in Karachi city. *International Journal in Management and Social Sciences*, 4(10): 125-137.
- Fauzee, Z. O. & Dada, M. (2021).** The effect of celebrity endorsement on consumer behaviour in Klang Valley Malaysia. *Electronic Journal of Business Management*, 6(4): 1-17.

- Fleck, N., Michel, G. & Zeitoum, V. (2014).** Brand personification through the use of spoke people: An exploratory study of ordinary employees, ceo's and celebrities featured in advertising. *Psychology and Marketing*, 31(1): 84-92.
- Horsky, D. & Simon, L. S. (1983).** Advertising and the diffusion of new products. *Marketing Sciences*, 2(1): 1-17.
- Ibitayo, F. A. & Tejumaiye, J. A. (2015).** Influence of celebrity in television advertising: A study of Pepsi consumers among Unilag undergraduate. *IOSR Journal of Humanities and Social Science*, 20(10): 26-31.
- Khalid, M. & Siddiqui, D. A. (2018).** Impact of celebrity endorsement on consumer buying behaviour towards beauty soap in Karachi city. *Journal of Customer Behaviour*, 11(1): 33-52.
- Kwan, V. L., Ahmad, R. & Ahmad R. (2019).** Cosmetic advertisements: A study on self-esteem and buying behaviour of young women in Kuala Lumpur, Malaysia. *International Journal of Recent Technology and Engineering (IJRTE)*, 7(5): 261-266.
- Majeed, M., Tijani, A. & Yaquob, A. (2020).** Factors predicting the effectiveness of celebrity endorsement advertising: HND Marketing Students Perceptive. *Global Journal of Management and Business Research*, 20(1): 5-13.
- Maran, K. & Rani J. (2013).** An impact of demographic variables on consumers preference with reference to air conditioner. *Paripex- Indian Journal of Research*, 2(7): 197-199.
- Mazzini, M., Rosidah, M., Rozita, N. M. & Halimahton, B. (2014).** Celebrity entrepreneur endorsement and advertising effectiveness. *Procedia-Social and Behavioral Science*, 130: 11-20.
- McCracken, G., (1989).** Who is the celebrity endorser? Cultural foundations of the endorsement process. *Journal of Consumer Research*, 16(3): 310-321.
- O'Doherty, K. C., (2022).** Trust, trustworthiness, and relationships: Ontological reflections on public trust in science. *Journal of Responsible Innovation*, 10(1): 1-22.
- Rojhe, K. C. & Hosaini, A. (2020).** Review paper on factors influencing consumer behaviour. *Test Engineering & Management*, The Mattingley Publishing Co. Inc., pp.7059-7066.
- Satria, A. D., Jatipuri, Sarah., Hartanti, A. D. & Sanny, L. (2019).** The impact of celebrity endorsement by social influencer celebgram on purchase intention of generation z in fashion industry. *International Journal of Recent Technology and Engineering*, 8(25): 397-404.
- Serban, C., (2010).** Marketing communication in online social programs: Ohanian model of source credibility. *Strategic Marketing in Practice*, Butterworth-Heinemann, pp.105.
- Singh, R. P. & Banerjee, N. (2018).** Exploring the influence of celebrity credibility on brand attitude, advertisement attitude & purchase intention. *Global Business Review*, 19(6): 1622-1639.
- Thakur, J. (2020).** Role of celebrity endorsement in advertising for promotion and awareness. *International Journal of Application or Innovation in Engineering and Management*, 9(6): 100-112.
- Vyas, R. & Parmar, G. (2019).** A study on role of television advertisement on cosmetic purchase among youth. *Global Journal of Research in Management*, 9(1): 1-11.
- Widiger, T. A. & Crego, C. (2019).** The five factor model of personality structure: An update. *World Psychiatry*, 18(3): 271-272.
- Willing, M. Z. & Fruchter, G. E. (2013).** Matching product attributes to celebrities who reinforce the brand: An innovative algorithmic selection model. *Journal of Advertising Research*, 53(4): 391-410.
- Yamane, T., (1967).** Statistics: An introductory analysis. 2nd Edition, New York: Harper and Row.
- Zipporah, M. M., & Mberia, H. K. (2014).** The effect of celebrity endorsement in advertisements. *International Journal of Academic Research in Economics and Management Sciences*, 3(5): 178-187.

Micro Celebrities as Influencers by Self Presentation on Social Media Online: Gaining Consumer Equilibrium

Ms. Amla K.K

Research Scholar (Ph.D) Jamal Mohammed
College, Affiliated to Bharathidasan
University, Tiruchirappalli, Tamilnadu, India

Dr. A. Khaleelur Rahman

Associate Professor, Jamal Mohammed
College, Affiliated to Bharathidasan
University, Tiruchirappalli, Tamilnadu, India

Abstract

A lot of research on communication and persuasion has been done using the source credibility model, especially in areas like public relations, political communication, and advertising. In order to better understand how a micro celebrity presents themselves online, the study will look at their influence of factors such as attractiveness, reliability, and experience on what reviews and ratings they post. Respondents received a Google form (online) with a structured questionnaire with seventeen statements. The investigation's final data, which included 231 samples ranging in age from 17 to over 45, was examined. To attempt to achieve the goals of the study, a null hypothesis was generated and tested. Regression analysis was used as a statistical tool to examine the hypothesis. It is evident from the investigation's findings that every null hypothesis was rejected. This research shows that a micro celebrity's level of attractiveness, trustworthiness, and expertise are all major determinants of their online reviews and ratings. The findings also show that, if micro celebrities follow specific guidelines for online activity and self-presentation, customers find them attractive, reliable, and knowledgeable.

Keywords: Brand Image, Micro-Celebrity, Reviews, Rating, Source Credibility.

Introduction

Online influencer endorsement has been the focus of recent marketing and information systems research. Celebrity endorsement has been regularly used for years by businesses of all kinds and in a variety of sectors to draw clients and market goods (Erdogan 1999). Social media platforms have been utilized by multiple sectors and industries as a marketing approach for developing brand values (Christodoulides 2011). Influencers on social media are people who have developed a reputation for themselves and following on social media frequently by specialising in a certain field of interest (Wibisono, m et.al 2023). A study by Djafavora and Trofimenko, O(2019) on how micro-celebrities express themselves on social media is also available. Influencers on Chinese Gen Z's intention to buy through social media are also documented (Chiu, CL and Ho, HC 2023). Electronic word of mouth (eWoM), according to Jin and Phua (2014), influenced consumers' buying intentions based on their attractiveness and expertise as well as their reviews and rating at some extend. According to Ohanian, (1990) Source Credibility is analysed by favorable characteristics of user that affect the receiver's acceptance towards the message conveyed.

In a micro celebrity endorsement, the micro celebrity serves as the brand's spokesperson on their preferred social media channels, encouraging their followers to purchase the products they recommend and The new breed of fame brought forth by social media is referred to as micro celebrities (Khamis et al., 2017). Client testimonials are one approach to get the attention of customers who get overwhelmed with information (Weber L 2009). Macheke, T., Quaye, E. S., & Ligaraba, N. (2024) found a significant correlation between female consumers' buy intentions and celebrity endorsements, reviews, and ratings.

When a consumer decides to buy anything after reading online evaluations and ratings from micro-celebrities, it helps a business or brand acquire customer value, which allows advertisers to improve the perception of their brand (Mythili, G., & Vanitha, P. 2024). Eisend, M. (2006) documents an analysis of source credibility characteristics in marketing communication. According to Jin and Phua's (2014) research, a person's perceived social influence increases with the number of followers they have. One of the key factors influencing microcelebrities is customer attitude towards social media advertising (Chen et al., 2011). Wilcox and Stephen, (2013) refers that, buying tendency is greater in female users compared to male users to buy products that were endorsed by their favourite celebrities. Malek and Ligaraba N (2020) propose that the online activity of Generation Y in the fashion sector influences consumers' purchasing intentions, with online bloggers having a significantly greater influence than traditional media outlets.

Theoretical Background

Micro Celebrity

Micro celebrities are social media influencers who have built a reputation for their knowledge and expertise on a specific topic (Erdogan, 1999). Micro celebrities are micro influencers who can make regular posts videos about

a particular brand or topic on their preferred social media channels to encourage their followers to buy a products they promote (Cheung, 2012). According to Roy, 2006 micro celebrities are having large following of enthusiastic, engaged people who pay close attention their views. According to Khamis et al (2017) micro celebrities are new type of celebrity created by social media who have built up more significant followers. Micro celebrities are generally have high profile and can be excellent at raising awareness among public as one of the profitable marketing communication strategies. Micro-celebrities, sometimes referred to as internet celebrities or social media influencers, are people who have developed a sizable fan base on social media sites like Instagram, TikTok, YouTube, or Twitter.

Source Credibility Model

Source credibility model is considered to be the most powerful and most suitably applicable for the purpose of this research. Ohanian, (1990) detailed that source credibility model is the most known model among various models attempted to explain the dimensions of celebrity endorsement and attractiveness, trustworthiness and expertise are the major dimensions of source credibility model in terms of celebrity endorsement. Various studies suggested that (Djafarova&Rushworth, 2017; Ohanian, 1990), audience perceives the source as knowledgeable and can gain expertise in terms of product knowledge through source credibility up to some extent. Electronic word of mouth (eWOM) communications has created appropriate influence on brand attitude in terms of perceived credibility.

Fifteen sub-credibility factors are considered highly significant in context of visuals in social media and in terms of issue of trust within the online platform (Till &Busler, 2000). According to Ohanian (1991), the details of the sub-credibility factors are as follows.

- Attractiveness/Similarity; attractive, beautiful, classy, sexy and elegant.
- Trustworthiness; trustworthy, dependable, sincere, reliable and honest.
- Expertise; expert, knowledgeable, qualified, experienced and skilled.

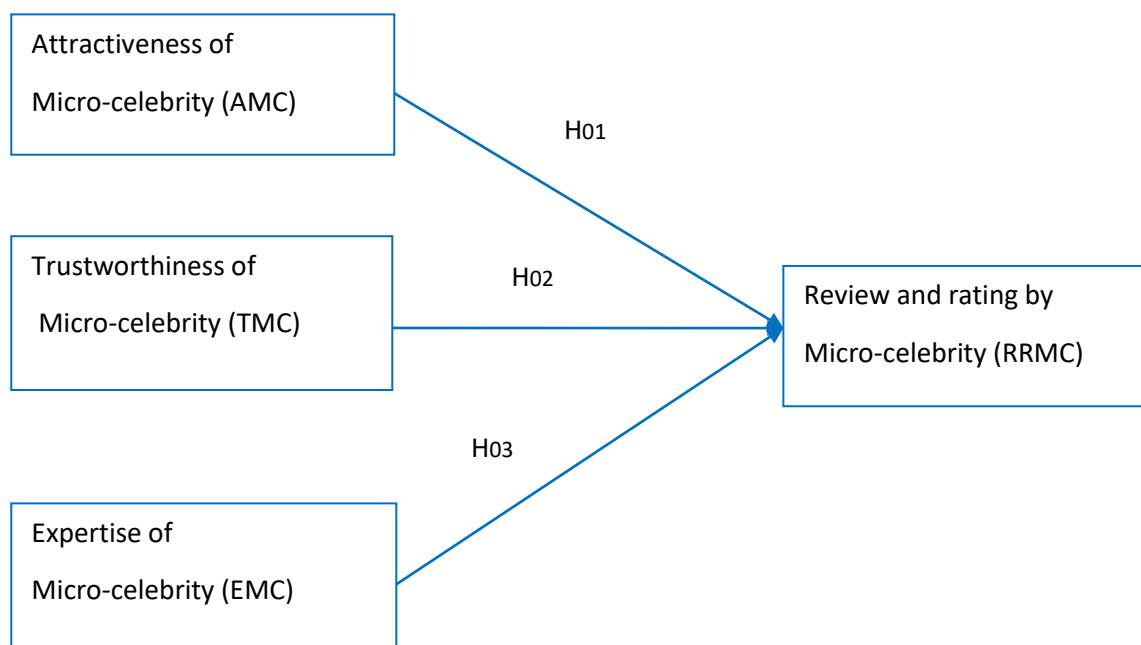


Figure 1. Source Credibility Mode

Research Methodology

Participants

The present study is based on the primary data collected from respondents of different age groups located in the rural and urban areas of South Kerala. This place attracts consumers to buy the different branded products and services.

Table 1. Demographic details of the respondents

	Groups	Frequency	Percentage
Gender	Female	93	40.3
	male	138	59.7
Age	17-25	68	29.4
	26-35	86	37.2
	36-45	52	22.5
	More than 45	25	10.8
Education	Any Other	61	26.4
	PG	59	25.5
	UG	111	48.1
Region of Residence	Rural	153	66.2
	Urban	78	33.8

Source: Author work

Demographic details of the respondent are given in Table.1. The gender profile is categorised in to males and females, which constitutes the percentage of 59.7 and 40.3 respectively. Four categories of age groups are included i.e., 17-25, 26-35, 36-45 and more than 45 years of age. The participation percentage is 29.4, 37.2, 22.5 and 10.8 respectively. Educational qualification of respondent is divided in to three categories namely UG, PG and any other, which constitutes the percentage of 48.1, 25.5 and 26.4 respectively. Region of residence is divided in to two categories i.e. rural and urban, which constitutes 66.2 and 33.8 percentage respectively. Table1 shows that age group of 17 to 45 are most active in social media and involves in brand selection and purchasing things.

Construct Measurement

There are three constructs to analyse the study based on source credibility model i.e construct attractiveness, construct trustworthiness and construct expertise respectively. Construct attractiveness comprises sub-credibility sources like similarity, likeability and familiarity with respondent. Construct trustworthiness comprises sub-credibility sources like trustworthiness, dependability, sincerity, honesty and reliability. Construct expertise comprises sub-credibility sources like skills, experience, expertise, qualified and knowledge.

Table.2. Mean, SD, Factor Loading Statistics Measurement Items

	Mean	SD	FSW	SRW
Review and rating by micro-celebrity (RRMC)				
RRMC1	4.05	0.702	0.1308	0.5386
RRMC2	3.9	0.790	0.0825	0.4359
RRMC3	3.59	0.801	0.2204	0.7143
Attractiveness of micro-celebrity (AMC)				
AMC1	3.53	0.898	0.0802	0.4789
AMC2	3.51	0.859	0.1024	0.5387
AMC4	3.69	0.789	0.1299	0.5833
Trustworthiness of micro-celebrity (TMC)				
TMC1	3.53	0.848	0.1516	0.6546
TMC3	3.48	0.913	0.0981	0.5533
TMC4	3.49	0.854	0.1295	0.6139
TMC5	3.42	0.886	0.2329	0.7642
Expertise of micro-celebrity (EMC)				
EMC1	3.42	0.943	0.1679	0.695

EMC2	3.63	0.918	0.1923	0.7206
EMC3	3.67	0.827	0.1164	0.5607
EMC4	3.52	0.927	0.1613	0.6809
EMC5	3.81	0.777	0.1326	0.5805

Source: Author work

SD; standard deviation, SRW; standard regression weight, FSW; factor score weights

Research Instrument

In order to understand, whether the reviews and ratings given by micro-celebrities in social media as self-presentation are reliable, trustworthy, familiar, and similar and do the customers find these reviews and rating useful, clear and understandable, a structured questionnaire was used, which contain 17 statements to analyse the impact of review and rating given by micro celebrity as eWOM in social media on consumer endorsement and the data of this research is collected through Google forms. Each statement is analysed using Five-point Likert scale. First point being (strongly agree) and fifth point being (strongly disagree).

Data Collection and Sampling

More than 750 individuals were provided with the Google form (online) questionnaire. Out of 260 responses 231 responses were found appropriate for the current research. Only 30.8% of people have responded in the final. To evaluate the hypothesis, the researcher used confirmatory factor analysis and regression analysis.

Hypothesis of the Study

H01: The review and rating given by micro celebrity (RRMC) does not get affected by attractiveness of micro celebrity (AMC)

H1: The review and rating given by micro celebrity (RRMC) gets affected by attractiveness of micro celebrity (AMC)

H02: There is no significant impact of trustworthiness of micro celebrity (TMC) on review and rating given by micro celebrity (RRMC)

H2: There is a significant impact of trustworthiness of micro celebrity (TMC) on review and rating given by micro celebrity (RRMC)

H03: The review and rating given by micro celebrity (RRMC) does not get affected by expertise of micro celebrity (EMC)

H3: The review and rating given by micro celebrity (RRMC) gets affected by expertise of micro celebrity (EMC)

Table 3. Correlation matrix

	TMC	AMC	EMC	RRMC
TMC	1.000			
AMC	0.811**	1.000		
EMC	0.749**	0.809**	1.000	
RRMC	0.606**	0.786**	0.377**	1.000

Source: Author work

** indicates the values are significant for $\alpha = 0.05$.

Correlation values of the construct are given in Table 3. TMC, AMC and EMC are correlated with RRMC, which are significant with $\alpha = 0.05$. Table 3 confirm that, the correlation AMC and RRMC (0.786**), AMC and EMC (0.809**), TMC and AMC (0.811**).

Data Analysis and Interpretation

Reliability

The alpha value for the questionnaire utilised for this investigation is 0.913, which is thought to be sufficient to continue the planned study. According to Pooja and Sunil Kumar (2021) and other researchers investigations, even values of 0.7 in social sciences will be regarded as relevant. Alpha value of attractiveness AMC is 0.780, which is significant. The alpha value of trustworthiness TMC and expertise EMC is 0.836 and 0.852

respectively. The RRM C's alpha value is 0.811, which is acceptable. All of the alpha values were deemed significant to continue this study. The reliability score of the survey needs to be more than 0.75. Murphy and Davidshofer (1988) defined reliability as insufficient at 0.6, poor at 0.7, moderate to high at 0.8-0.9, and high at >0.9.

Table 4. Fit Indices of Attractiveness of micro-celebrity, Trustworthiness of micro-celebrity, Expertise of micro-celebrity and review and rating by micro celebrity

Fit Indices	Estimated Value	Recommended Value	Reference
Chi-Square	<i>P-Value = 0.00</i>	P-Value > 0.00	Meyers et al, 2005
CMIN/DF	2.1168	< 5.0	Marsh &Hocevar, 1985
GFI	0.9139	> 0.90	Chau, 1997
RMSEA	0.0697	< 0.80	Byrne, 2001
RMR	0.0448	< 0.05	Meyers et al, 2005
PNFI	0.6508	> 0.5	Meyers et al, 2005
AGFI	0.877	> 0.80	Hair et al, 2009

Source: Research Output

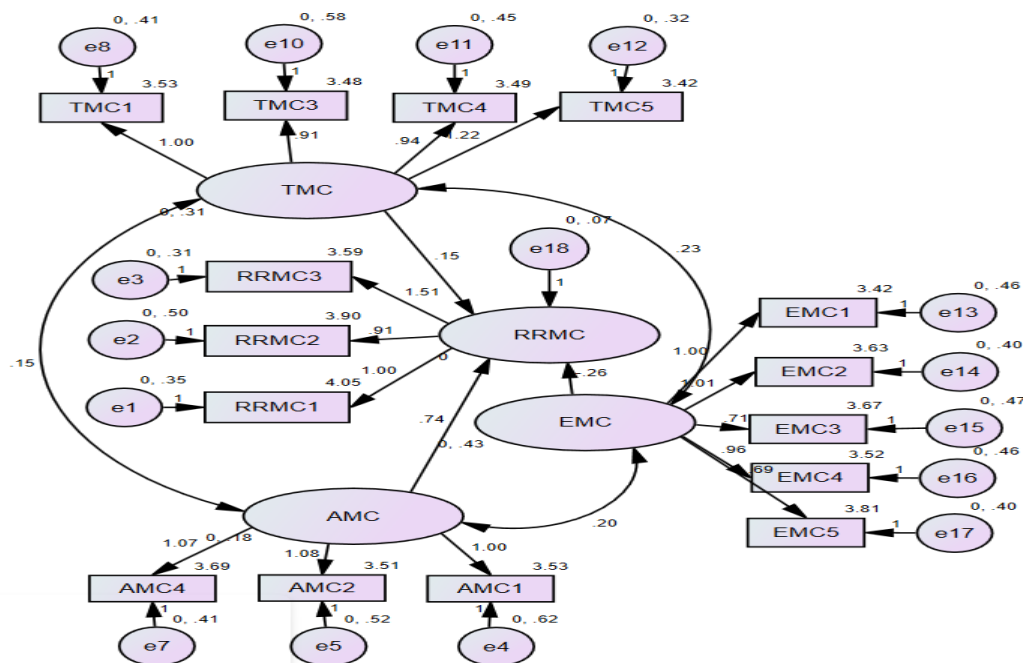


Figure.2. Path Analysis

These path analysis values are estimated using the goodness of fit and badness of fit indices. The GFI (Goodness of Fit Index) model fit value is 0.913, which is suitable for this model due to its value should be more than 0.90 according to Chaul, 1997. RMSEA (Root Mean Square Error Approximation) values should be less than 0.8 (Byrne, 2001) which denotes badness of fit index. The present study RMSEA value is 0.669, which satisfies the badness of fit. The value of CMN/DF is 2.11, which can be considerable for this model because its value should be less than 5.0 (Marsh and Hocover, 1995). The value of RMR(Root Mean Square Residuals) PNFI (Parsimony Normed Fit Index), AGFI (Adjusted Goodness of Fit Index) also satisfy goodness of fit index. The value of RMR is 0.044, which should be less than 0.05 (Meyers.et.al 2005).The value of PNFI is 0.650, which should be more than 0.5(Meyers et al 2005). The value of AGFI is 0.877; and its volume should be more than 0.8 (Hair et al 2009).

Regression Weight (CFA)

The regression weight denotes the importance of each statement in the questionnaire. Table 5 shows that, all the statements are significant and their p-values are less than 0.05. It indicates that, all the statements are appropriate for the purpose of the study. The mean value, median value along with its standard deviation, Skewness and Kurtosis are given in Table 6.

Table 5. Regression Weights of measurement items

			Estimate	S.E.	C.R.	P-Value
RRMC	<---	AMC	0.7418	0.2753	2.6942	0.0071
RRMC	<---	TMC	0.1515	0.1198	1.2649	0.2059
RRMC	<---	EMC	-0.2609	0.1263	-2.0666	0.0388
RRMC_1	<---	RRMC	1			
RRMC_2	<---	RRMC	0.9106	0.2006	4.5391	***
RRMC_3	<---	RRMC	1.5141	0.2859	5.2965	***
AMC_1	<---	AMC	1			
AMC_2	<---	AMC	1.0759	0.2091	5.1448	***
AMC_4	<---	AMC	1.0699	0.2001	5.3457	***
TMC_1	<---	TMC	1			
TMC_3	<---	TMC	0.9097	0.1326	6.8626	***
TMC_4	<---	TMC	0.9441	0.1266	7.4564	***
TMC_5	<---	TMC	1.2188	0.1426	8.546	***
EMC_1	<---	EMC	1			
EMC_2	<---	EMC	1.0092	0.1109	9.1007	***
EMC_3	<---	EMC	0.7077	0.0961	7.3634	***
EMC_4	<---	EMC	0.9632	0.1106	8.7103	***
EMC_5	<---	EMC	0.6887	0.0907	7.5966	***

Source: Research Output

Table 6. Sample size, Mean, Median, Std. deviation Skewness and Kurtosis

Variables	N	Mean	Median	Std. Deviation	Skewness	Kurtosis
TMC	231	3.75	3.81	0.59	-0.04	-0.07
AMC	231	2.83	2.83	0.37	-0.03	0.22
EMC	231	3.40	3.41	0.57	0.01	0.03
RRMC	231	2.25	2.28	0.31	-0.45	1.59

Source: Research Output

Hypothesis Testing

Table 7. Hypothesis test result of regression analysis

	R-Square	Unstandardi zed Beta (B)	Standardized Beta (B)	Std. Error	t	P-Value	Durbin- Watson
Predictors: (Constant), AMC and Dependent Variable: RRMC (H1: Rejected)	0.618	0.667	0.786	0.035	19.2	0	1.896

Predictors: (Constant), TME and Dependent Variable: RRCE (H2 : Rejected)	0.367	0.318	0.606	0.028	11.5	0	1.724
Predictors: (Constant), EMC and Dependent Variable: RRMCM (H3: Rejected)	0.142	0.206	0.377	0.033	6.16	0	1.795

Source: Research Output

The Table 7 shows that AMC has significant impact on RRMCM. In this case, the value of P is 0.000, indicating that, the null hypothesis H1 is rejected. The result of this study reveals that, attractiveness of micro celebrity has a significant impact on the reviews and rating given by micro celebrity. TMC also has significant impact on RRMCM. Here the p-value is 0.000 and hence the null hypothesis H2 is rejected. This results also reveals that, the trustworthiness of micro celebrity has a significant impacts on the reviews and rating given by micro celebrity. Table 7 also included that, EMC has also has inevitable impact on RRMCM. Here the value of P is again 0.000 and hence the null hypothesis H3 is rejected. This result reveals that, expertise of micro celebrity has a significant impact on the reviews and rating given by micro celebrity. Plot for regression analysis is given in Figure 1.

Findings

There are four set of questions in which first set is on reviews and rating given by micro celebrity, second set of questions is related to attractiveness of micro celebrity, third set of questions is on trustworthiness of micro celebrity and fourth set of questions is on expertise of micro celebrity. The result shows that, attractiveness of micro celebrity has significant impact on reviews and rating given by micro celebrity. $P=0.000$ and $R^2=0.618$ confirms null hypothesis has been rejected. It means the attractiveness of micro celebrity positively influences reviews and rating by micro celebrity. The result shows that trustworthiness of micro celebrity has substantial impact on reviews and rating by micro celebrity. $P=0.000$ and $R^2=0.367$ shows null hypothesis has been rejected. Trustworthiness has also positively influences the reviews and rating by micro celebrity. The result shows that expertise of micro celebrity has substantial impact on review and rating given by micro celebrity. $P=0.000$ and $R^2=0.142$ shows null hypothesis has been rejected. Expertise of micro celebrity has also an important attribute to decide the brand selection.

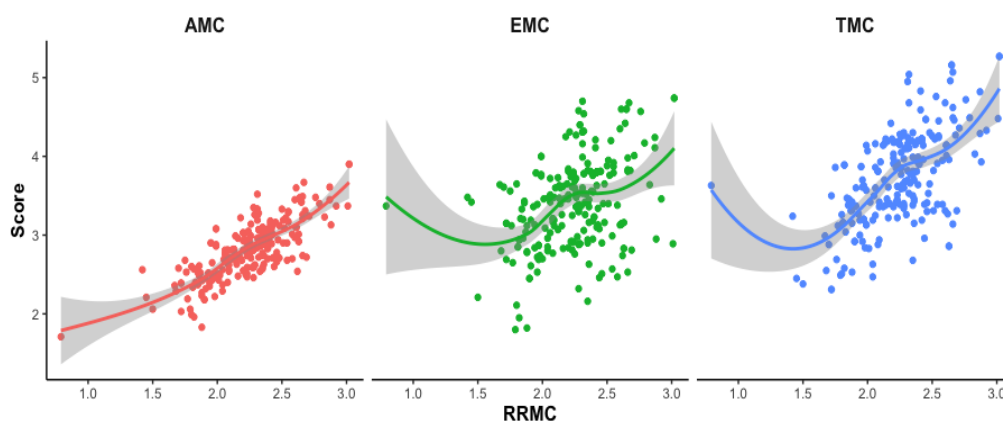


Figure 2.Plot for regression analysis

Discussion

For a business to succeed in a competitive marketplace, it is crucial to understand consumer behaviour patterns and the underlying causes. Understanding Consumer tastes and the marketing communication process can be used efficiently and forcefully to influence consumers' purchasing decisions. The main reason of adopting the concept of micro celebrity is that, the extent of the message among public especially among younger generations. According to Kumar, S. K. (2021) Zhang et al (2018), consumer prefer the brand or products based on the source credibility of the consumer endorser. The results of this research make it clear that trustworthiness, attractiveness, and expertise are positively correlated with reviews and ratings.

Micro celebrity is the one who has used the preferred social media platforms to encourage their large number of followers as well as other customers to buy products they promote. The aim of the study was to assess whether rating and reviews given by micro celebrity is advised by the followers or consumers and accordingly do they find it attractive, trustworthy and relevant expertise. The study used regression analysis to test the hypothesis. The aforementioned regression value clearly showed that all hypotheses were rejected. The finding of the study reveals that attractiveness, trustworthiness and expertise of micro celebrity influence the review and rating by micro celebrity. The finding of the study is useful for marketing managers in e-commerce; different firms engaged in advertisement planning and brand management. Companies frequently utilise reviews and ratings as part of their advertising because reviews and ratings are straightforward, accurate, credible, affordable, and time-efficient ways to influence customers' buying decisions.

Conclusion, Future Scope of the Study and Limitations

The results of this study illustrate that social media users follow microcelebrities on online platforms. Respondents believe that in order for micro celebrities to effectively advocate products, they would need to be credible, inspiring, clever, innovative, and professional in their posts. Researchers have used the source credibility model to explain how expertise, trustworthiness, and attractiveness affect reviews and ratings. The investigators of this study evaluated the attractiveness, trustworthiness, and expertise of three source credibility model components. Future research is concerned; this source credibility model can be used in different industries especially in tourism sectors. Region wise study can be added in future research. However, there are some shortcomings to this study as well. Only those individuals residing in the specific areas of South Kerala (both urban and rural) were selected for the sample using a Google form (online). The study examines empirically, because it totally based on consumer belief, attitude etc. Finally, another limitation is that, there is no quantitative information collected during the entire study, hence quantitative techniques can be applied in future research.

Reference:

- Brisson, N. T., Byon, K. K., & Baker III, T. A. (2016).** To tweet or not to tweet: the effects of social media endorsements on unfamiliar sport brands and athlete endorsers. *Innovation*, 18(3), 309-326. <https://doi.org/10.1080/14479338.2016.1237304>
- Byrne, B. M. (2001).** Structural equation modeling with AMOS, EQS, and LISREL: Comparative approaches to testing for the factorial validity of a measuring instrument. *International journal of testing*, 1(1), 55-86.
- Chen, Y., Fay, S., & Wang, Q. (2011).** The role of marketing in social media: How online consumer reviews evolve. *Journal of interactive marketing*, 25(2), 85-94. <https://doi.org/10.1016/j.intmar.2011.01.003>
- Cheung, C. M., & Thadani, D. R. (2012).** The impact of electronic word-of-mouth communication: A literature analysis and integrative model. *Decision support systems*, 54(1), 461-470.
- Chiu, C. L., & Ho, H. C. (2023).** Impact of celebrity, micro-celebrity, and virtual influencers on Chinese Gen Z's purchase intention through social media. *SAGE Open*, 13(1), 21582440231164034.
- Christodoulides, G., Jevons, C., & Blackshaw, P. (2011).** The voice of the consumer speaks forcefully in brand identity: User-generated content forces smart marketers to listen. *Journal of Advertising Research*, 51(1 50th Anniversary Supplement), 101-111. DOI: 10.2501/JAR-51-1-101-111
- Djafarova, E., & Rushworth, C. (2017).** Exploring the credibility of online celebrities' Instagram profiles in influencing the purchase decisions of young female users. *Computers in human behavior*, 68, 1-7. . <https://doi.org/10.1016/j.chb.2016.11.009>
- Djafarova, E., & Trofimenko, O. (2019).** 'Instafamous'—credibility and self-presentation of micro-celebrities on social media. *Information, communication & society*, 22(10), 1432-1446.
- Eisend, M. (2006).** Source credibility dimensions in marketing communication—A generalized solution. *Journal of Empirical Generalisations in Marketing Science*, 10(2).
- Erdogan, B. Z. (1999).** Celebrity endorsement: A literature review. *Journal of marketing management*, 15(4), 291-314.
- Erdogan, B. Z. (1999).** Celebrity endorsement: A literature review. *Journal of marketing management*, 15(4), 291-314. <https://doi.org/10.1362/026725799784870379>
- Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012).** An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the academy of marketing science*, 40, 414-433.
- Jin, S. A. A., & Phua, J. (2014).** Following celebrities' tweets about brands: The impact of twitter-based electronic word-of-mouth on consumers' source credibility perception, buying intention, and social identification with celebrities. *Journal of advertising*, 43(2), 181-195.
- Jin, S. A. A., & Phua, J. (2014).** Following celebrities' tweets about brands: The impact of twitter-based electronic word-of-mouth on consumers' source credibility perception, buying intention, and social identification with celebrities. *Journal of advertising*, 43(2), 181-195. <https://doi.org/10.1080/00913367.2013.827606>
- Khamis, S., Ang, L., & Welling, R. (2017).** Self-branding, 'micro-celebrity' and the rise of social media influencers. *Celebrity studies*, 8(2), 191-208. <https://doi.org/10.1080/19392397.2016.1218292>
- Kumar, S. K. (2021).** Reviews Posted and Ratings given by Consumer Endorsers: Gaining Customer Value. *Ramanujan International Journal of Business and Research*, 6, 144-155. <https://doi.org/10.51245/rijbr.v6i1.2021.477>
- Macheka, T., Quaye, E. S., & Ligaraba, N. (2024).** The effect of online customer reviews and celebrity endorsement on young female consumers' purchase intentions. *Young Consumers*, 25(4), 462-482.
- Malek, M., & Ligaraba, N. (2020).** How fashion bloggers can influence Generation Y's online behaviour. *The Retail and Marketing Review*, 16(1), 26-39.

Mythili, G., & Vanitha, P. (2024). IMPACT OF CELEBRITY ENDORSEMENT TOWARDS CONSUMER PACKAGED GOODS. *International Journal of Scientific Research in Modern Science and Technology*, 3(2), 47-56.

Ohanian, R. (1990). Construction and validation of a scale to measure celebrity endorsers' perceived expertise, trustworthiness, and attractiveness. *Journal of advertising*, 19(3), 39-52. <https://doi.org/10.1080/00913367.1990.10673191>

Roy, S. (2006). An exploratory study in celebrity endorsements. *Journal of creative communications*, 1(2), 139-153.

Weber, L. (2009). Marketing to the social web: How digital customer communities build your business. John Wiley & Sons.

Wibisono, M. M. B., Prasetyanto, H., Sitanggang, B., Dewangga, A., & Maryati, M. (2023). Impacts of Influencers on Customer's Purchase Intentions in Instagram. *Indonesian Business Review*, 6(1), 35-48.

Wilcox, K., & Stephen, A. T. (2013). Are close friends the enemy? Online social networks, self-esteem, and self-control. *Journal of Consumer research*, 40(1), 90-103. <https://doi.org/10.1086/668794>

Zhang, Y., Lin, Y., & Goh, K. H. (2018). Impact of Online Influencer Endorsement on Product Sales: Quantifying Value of Online Influencer. In *PACIS* (p. 201).

Technological Innovations in Indian Higher Education Institutions: A Regional Study of the Indian Subcontinent

Ms. Rashi Jain

Research Scholar, Bharati Vidyapeeth
(Deemed to be University), Pune, India

Prof. (Dr.) Broto Rauth Bhardwaj

Professor, Bharati Vidyapeeth Institute of
Management & Research, New Delhi, India

Abstract

This paper explores the determinants of online education adoption in higher education, with a particular focus on India. It investigates the implications of this adoption for the digital economy and entrepreneurial initiatives within the country. Using empirical analysis conducted through the Statistical Package for Social Sciences (SPSS) and Analysis of Moment Structures (AMOS), the research identifies five key factors via factor analysis. The study highlights the importance of online education platform usability and examines how user satisfaction, ease of use, technological infrastructure, quality, facilitating conditions and cost-efficiency contribute to its adoption. The findings suggest that expanding accessible and inclusive online education in India could significantly advance sustainable development goals, stimulate entrepreneurial ventures, and ultimately boost economic output and per capita income in the region.

Keywords: Online Education Adoption, Higher Education, India, Digital Economy.

Introduction

The onset of COVID-19 has profoundly transformed online education, pushing higher education institutions to adapt rapidly to online formats to curb the virus's spread. This abrupt transition, especially in countries like India, has exacerbated existing social and digital exclusion issues, impacting device accessibility and affordability. The pandemic has severely disrupted education, particularly in under-resourced areas with limited technology access (Khan et al., 2012). Online education, involving internet-mediated instruction through various technologies (Dabbagh and Bannan-Ritland, 2005), has become essential. However, developing countries face greater challenges in implementing these systems compared to their developed counterparts (Dawadi et al., 2020; Uddin, 2020; Saeed, 2020). Flexi-learning, e-learning, and blended learning are now standard in higher education, offering benefits like accessibility and affordability (Becker, 2017; Castro & Tumibay, 2021; Dhawan, 2020). Yet, challenges such as a lack of policies and guidelines persist (Mohammadi et al., 2021). Technology can overcome barriers of space and time, but its application remains difficult in resource-constrained settings (Baldwin, n.d.; Stantchev et al., 2014). Recent studies show that job-relevant online content with localized support enhances program completion rates, and automated feedback improves performance and reduces instructor workload (Littenberg-Tobias & Reich, 2020; Cavalcanti et al., 2021). The shift to online education, accelerated by the pandemic, addresses temporal and spatial challenges (Panigrahi, Srivastava, and Sharma 2018). Approximately 10 million academic hours were lost due to COVID-19 (Dutta, 2020). The University Grant Commission of India has promoted open-access tools, with many institutions using platforms like Google Meet, Zoom, and YouTube for live and recorded lectures. Despite its long-standing existence, online education's prominence has surged, particularly in postgraduate education (Allen et al., 2016). Gurunath et al. (2022) highlight that India's semester system faced significant hurdles during the pandemic, making the selection of effective online platforms a current priority for institutions (Gurunath et al., 2022).

Literature Review

The integration of online learning systems in higher education has expanded significantly worldwide (Allen, 2007). The acceptance of online learning by students and entrepreneurs varies with the nature of the course, whether theoretical or practical. Al-Adwan et al. (2013) found that the technology adoption model (TAM) effectively predicts e-learning acceptance. Despite the growth of online education (Seaman et al., 2018), challenges remain, such as high non-completion rates among students and entrepreneurs (Rovai, 2003; Simpson, 2010, 2013; Vossensteyn et al., 2015). Student satisfaction is crucial for evaluating online learning environments and often differs between Asian and Western cultures (Krouska et al., 2021; Parahoo et al., 2015). Satisfaction influences student retention and course quality (Alqurashi, 2018; Bolliger and Martindale, 2004). Research indicates that satisfied students are more likely to continue with the same instructor (Devinder and Datta, 2003). The literature supports that self-confidence, grit, self-efficacy, ease of use, and perceived usefulness are key predictors of digital tool adoption (Pagan, 2014; Hamid et al., 2016). Edumadze et al. (2022) highlighted that awareness and perceptions of online education are crucial for its acceptance and utilization. Digital education, facilitated by various ICT tools, overcomes traditional barriers of distance and location,

enhancing educational access (Oriji and Torunarigha, 2019; Renes, 2015). While online learning offers advantages such as accessibility and affordability (Castro & Tumibay, 2021; Dhawan, 2020), it cannot fully replace traditional in-person learning, which is essential for holistic development (Ahmed, 2022; Yiwen Li et al., 2021).

Based on the above literature review, we propose the following hypothesis:

HA1: Satisfaction influences Adoption of Online education significantly

HA2: Ease of use influences Adoption of Online education significantly.

HA3: Technology influences Adoption of Online education significantly.

HA4: Cost influences adoption of online education significantly.

HA5: Facilitating Conditions influences Adoption of Online education significantly.

HA6: Quality influences Adoption of Online education significantly.

Conceptual Model

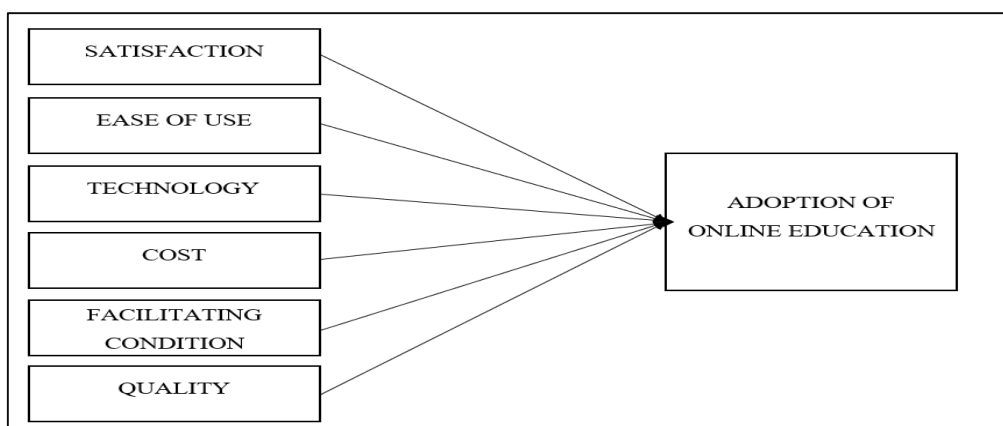


Figure 1 Conceptual Model

Source: Authors Own Compilation

Research Methodology

This study employs an empirical research design to explore relationships among variables and develop a framework for understanding the factors affecting online education and its role in enhancing the digital economy in India. Primary data is collected through a structured questionnaire, crafted based on a thorough literature review. This design supports the study's objectives by focusing on direct observation and measurement of phenomena, with findings rooted in real-world experiences. The study will gather data from 250 respondents, including students and entrepreneurs from higher education institutions in Delhi, using a structured questionnaire addressing five factors: Satisfaction, Ease of Use, Technology, and Cost. Random sampling will be used, with the sample size justified by Kline's (1998) recommendation of $21 \times 10 = 210$.

Data Analysis

Factor Analysis was run to obtain the results. Respondents included students of higher education institutes.

The adequacy, reliability and validity of the data were measured through KMO & Bartlett's Test and Cronbach Alpha. The following results are obtained as presented in the table below.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.752
Bartlett's Test of Sphericity	Approx. Chi-Square	6030.221
	Df	210
	Sig.	.000

Table 1: KMO and Bartlett's Test

Source: Authors Own Compilation through data analysis

The KMO test showed the value greater than 0.60 which is considered acceptable. The Bartlett 's test of sphericity provides a significant χ^2 value of 6030.221 ($p < .000$, $df = 210$). The sampling adequacy value of KMO was found to be 0.752, indicating that the sample was sufficiently decent.

Summary of Reliability Analysis of Individual Constructs				
S No.	Variables	Items	Cronbach's Alpha Coefficient	Reliability Results
1	Satisfaction	4	.896	Good
2	Ease of Use	4	.929	Excellent
3	Technology	4	.992	Excellent
4	Cost	5	.928	Excellent
5	Facilitating Condition	5	.897	Good
6	Quality		.867	Good
7	Adoption	4	.990	Excellent

Table 2: Summary of Reliability Analysis of Individual Constructs

Source: Authors Own Compilation through data analysis

The overall α for all factors are above .8 which is considered to be excellent for the study.

Factor Analysis

Factor analysis (FA) is generally used to discover the factor structure of a measure and to examine its internal reliability. EFA tries to uncover complex patterns by exploring the dataset and testing predictions (Child, 2006). The total variance explained showed the cumulative percentage of 88% which is considered good as per Hair et.al.,2006. Also the factors were rotated through varimax rotation and 7 factors or components were drawn out of them. Statement below 0.5 were deleted at this stage and the above were retained.

Structural Equation Modeling

Structural Equation Modeling is a multivariate statistical analysis technique that is used to analyze structural relationships. The metrics that ought to be reported are listed below, along with their acceptable thresholds. The table 3 below shows the recommended value of each indices.

Model Fit Indices	Author	Recommended Value
CMIN/DF	Marsh & Hocevar1985	<5 indicating a reasonable fit
	Kline 1998	< 3 indicates an acceptable fit
GFI	Byrne2001, Hair et.al2006	> 0.7 indicates an acceptable fit
CFI	Bentler 1990	close to 0.9, indicates a relatively good fit
	Hu and Bentler 1999	>0.80 is permissible, >0.90 indicates a good fit, >0.95 indicates a great fit
RMSEA	Bentler 1990	<0.05 indicates a good fit, 0.05-0.10 indicates moderate fit,
SRMR	Sharif & Nia2018, Bentler 1990	< .09 acceptable fit

Table 3: Model Fit indices recommended by Authors

Source: Authors Own Compilation

MODEL FIT INDICES				
CMIN/DF	CFI	GFI	RMSEA	SRMR
3.327	0.954	0.912	0.064	0.0356

Table 4: Model Fit indices for the above conceptual model

Source: Authors Own Compilation through data analysis

The Table 4 represents the model fit indices for the figure 2. All the indices are in the range as per table 8. Hence the model is considered to be fit. Also, the factors were found to be significant i.e., $p=0.000$

Path Analysis

MODEL FIT INDICES				
CMIN/DF	CFI	GFI	RMSEA	SRMR
4.658	0.997	0.997	0.080	0.0087

Table 5 :Model Fit indices for above conceptual model

Source: Authors Own Compilation through data analysis

The Table 5 represents the model fit indices for the figure 3. All the indices are in the range as per table 3. Hence the model is considered to be fit. Also, the factors were found to be significant i.e., $p=0.000$

Conclusion

The abrupt onset of COVID-19 and the ensuing lockdown caused a major disruption in traditional pedagogical approaches, leading to a swift transition to online learning. This study critically evaluates the impact of this shift on Indian students and entrepreneurs in higher education. The closure of educational institutions forced educators to adopt e-learning models to prevent academic loss. However, this rapid transition, without adequate infrastructural support, undermined key aspects of traditional pedagogy, such as learner engagement, access to study materials, attentiveness, time management, and assessment.

In India, where many individuals already face social exclusion, the sudden move to e-learning heightened digital exclusion issues, particularly in terms of device accessibility and affordability. This added to the stress experienced by students and entrepreneurs unfamiliar with the required technology. While online education was initially viewed as a means to boost the digital economy, the COVID-19 pandemic accelerated its adoption. This study aims to identify the key factors influencing the adoption of online education by students and entrepreneurs in the post-pandemic era.

Cost has emerged as a significant factor in this adoption, along with satisfaction, ease of use, and technology. While online education has provided a workable solution during the crisis, it cannot fully replace traditional in-person learning, which remains vital for the holistic development of students and the cultivation of a promising future.

Reference:

- Ahmed, M. M. (2022).** 'The Usefulness of ICT in Education During the Lockdown for COVID-19: Asian Perspective', in Handbook of Research on Asian Perspectives of the Educational Impact of COVID-19. IGI Global, pp. 242-253.
- Al-Adwan, A., Al-Adwan, A. and Smedley, J. (2013).** 'Exploring students and entrepreneurs acceptance of e-learning using Technology Acceptance Model in Jordanian universities', International Journal of Education and Development using ICT, 9(2).
- Aliyyah, R. R., Rachmadtullah, R., Samsudin, A., Syaodih, E., Nurtanto, M. and Tambunan, A. R. S. (2020).** 'The perceptions of primary school teachers of online learning during the COVID-19 pandemic period: A case study in Indonesia', Journal of Ethnic and Cultural Studies, 7(2), pp. 90-109.
- Allen, I. E. and Seaman, J. (2016).** 'Online report card: Tracking online education in the United States', Babson Survey Research Group, Babson College, 231 Forest Street, Babson Park, MA 02457.
- Alqurashi, E. (2018).** 'Predicting student satisfaction and perceived learning within online learning environments', Distance Education, 40(1), pp. 133-148.
- Al-Rahmi, A., Shamsuddin, A. and Alismaiel, O. (2020).** 'Unified Theory of Acceptance and Use of Technology (UTAUT) Theory: The factors affecting students and entrepreneurs' academic performance in higher education', Psychology and Education Journal, 57(9), pp. 2839-2848.
- Anderson, T. (2008).** 'Towards a theory of online learning', Theory and Practice of Online Learning, 2, pp. 109-119.
- Bonk, C. J. and Graham, C. R. (2012).** The Handbook of Blended Learning: Global Perspectives, Local Designs. John Wiley & Sons.
- Cao, F. and Cai, J. (2022).** 'Online and Offline Interaction Model of International Chinese Education Based on Few-Shot Learning', Computational Intelligence and Neuroscience, 2022.
- Castro, M. D. B. and Tumibay, G. M. (2021).** 'A literature review: Efficacy of online learning courses for higher education institution using meta-analysis', Education and Information Technologies, 26, pp. 1367-1385.
- Cavalcanti, A. P., Barbosa, A., Carvalho, R., Freitas, F., Tsai, Y.-S., Gašević, D. and Mello, R. F. (2021).** 'Automatic feedback in online learning environments: A systematic literature review', Computers and Education: Artificial Intelligence, 2, 100027.
- Dhawan, S. (2020).** 'Online learning: A panacea in the time of COVID-19 crisis', Journal of Educational Technology Systems, 49(1), pp. 5-22.
- Dutta, A. (2020).** 'Impact of digital social media on Indian higher education: Alternative approaches of online learning during COVID-19 pandemic crisis', International Journal of Scientific and Research Publications, 10(5), pp. 604-611.
- Edumadze, J. K. E., Barfi, K. A., Arkorful, V. and Baffour Jnr, N. O. (2022).** 'Undergraduate student's perception of using video conferencing tools under lockdown amidst COVID-19 pandemic in Ghana', Interactive Learning Environments, pp. 1-12.
- Fleming, A.R., Oertle, K.M., Plotner, A.J. and Hakun, J.G. (2017).** 'Influence of social factors on student satisfaction among college students and entrepreneurs with disabilities', Journal of College Student Development, 58(2), pp. 215-228.
- Gurunath, R. and Samanta, D. (2022).** 'A novel approach for semantic web application in online education based on steganography', International Journal of Web-Based Learning and Teaching Technologies, 17(4), pp. 1-13.
- Harsasi, M. and Sutawijaya, A. (2018).** 'Determinants of student satisfaction in online tutorial: A study of a distance education institution', Turkish Online Journal of Distance Education, 19(1), pp. 89-99.
- Jan, M. A. (2021).** Application of Big Data, Blockchain, and Internet of Things for Education Informatization. Springer Nature.

- Joo, Y. J., Lee, H. W. and Ham, Y. (2014).** 'Integrating user interface and personal innovativeness into the TAM for mobile learning in Cyber University', *Journal of Computing in Higher Education*, 26(2), pp. 143-158.
- Khan, M. H. S., Hasan, M. and Clement, C. K. (2012).** 'Barriers to the introduction of ICT into education in developing countries: The example of Bangladesh', *International Journal of Instruction*, 5(2), pp. 61-80.
- Krouska, A., Troussas, C. and Sgouropoulou, C. (2021).** 'Mobile Game-Based Learning as a Solution in COVID-19 Era: Modeling the Pedagogical Affordance and Student Interactions', *Education and Information Technologies*.
- Kuo, Y., Walker, A., Belland, B. and Schroder, K. (2013).** 'A predictive study of student satisfaction in online education programs', *International Review of Research in Open and Distance Learning*, 14(1), pp. 16.
- Li, X., Yang, Y., Chu, S.K., et al. (2020).** 'Applying blended synchronous teaching and learning for flexible learning in higher education: An action research study at a university in Hong Kong', *Higher Education*.
- Liaw, S.-S. and Huang, H.-M. (2013).** 'Perceived satisfaction, perceived usefulness and interactive learning environments as predictors to self-regulation in e-learning environments', *Computers & Education*, 60, pp. 14-24.
- Littenberg-Tobias, J. and Reich, J. (2020).** 'Evaluating access, quality, and equity in online learning: A case study of a MOOC-based blended professional degree program', *The Internet and Higher Education*, 47, 100759.
- Mohammadi, M. K., Mohibbi, A. A. and Hedayati, M. H. (2021).** 'Investigating the challenges and factors influencing the use of the learning management system during the Covid-19 pandemic in Afghanistan', *Education and Information Technologies*.
- Musselin, C. (2018).** 'New Forms of Competition in Higher Education', *Socio-Economic Review*, 16(3), pp. 657-683.
- Orij, A. and Torunarigha, Y. D. (2019).** 'Digitized education: Examining the challenges of digital immigrant educators in the face of net generation learners', *KIU Journal of Social Sciences*, 5(4), pp. 337-347.
- Pagán-Ortiz, M. E., Cortés, D. E., Rudloff, N., Weitzman, P. and Levkoff, S. (2014).** 'Use of an online community to provide support to caregivers of people with dementia', *Journal of Gerontological Social Work*, 57(6-7), pp. 694-709.
- Pani, S. C., Alaa, A. H., Hassona, Y., Silawi, A., Al Kayed, A., Edetanlen, E. B., ... and Alwadai, M. S. (2021).** 'Taking dental education online – A path to effective blended learning and learner equity', *Saudi Journal of Oral Sciences*, 8, pp. 1.
- Panigrahi, R., Srivastava, P. R. and Sharma, D. (2018).** 'Online learning: Adoption, continuance, and learning outcome – A review of literature', *International Journal of Information Management*, 43, pp. 1-14.
- Parahoo, S. K., Santally, M. I., Rajabalee, Y. and Harvey, H. L. (2015).** 'Designing a predictive model of student satisfaction in online learning', *Journal of Marketing for Higher Education*, 26(1), pp. 1-19.
- Rovai, A. P. (2003).** 'In search of higher persistence rates in distance education online programs', *Internet and Higher Education*, 6(1), pp. 1-16.
- Seaman, J. E., Allen, I. E. and Seaman, J. (2018).** 'Grade increase: Tracking distance education in the United States', *The Internet and Higher Education*, 28(2), pp. 105-119.
- Secundo, G., Mele, G., Del Vecchio, P., Elia, G., Margherita, A. and Ndou, V. (2021).** 'Threat or opportunity? A case study of digital-enabled redesign of entrepreneurship education in the COVID-19 emergency', *Technological Forecasting and Social Change*, 166, 12056.
- Stantchev, V., Colomo-Palacios, R., Soto-Acosta, P. and Misra, S. (2014).** 'Learning management systems and cloud file hosting services: A study on students' acceptance', *Computers in Human Behavior*, 31, pp. 612-619.
- Stern, J. (2018).** 'Introduction to online teaching and learning', *International Review of Research in Open and Distributed Learning*, 19(5), pp. 256-262.
- Tess, P. A. (2013).** 'The role of social media in higher education classes (real and virtual)—A literature review', *Computers in Human Behavior*, 29(5), pp. 60-68.

HR Analytics: A Quantitative Analysis of Employee Data and Business Outcomes in Private Sector Organizations in India

Mr. Atul Chanodkar

Research Scholar, Shri Vaishnav
Vidyapeeth Vishwavidyalaya, Indore, M.P.,
India

Dr. T. K. Mandal

Professor, Shri Vaishnav Vidyapeeth
Vishwavidyalaya, Indore, M.P., India

Abstract

Data is the form of evidence. In the business context, data is significant to derive organizational performance. Data is keynote for decision making by professionals in an organization. HR data in an organization is its internal data and can be utilized to understand the organizational performance insights and future predictions. Research in the recent past has shown that organizations are replying on HR analytics and evidence-based decisions through people data to understand the workforce parameters, practices, issues, and challenges.

Digital transformation is pushing HR departments to embrace data analysis. Organizations are using workforce data to inform critical decisions in areas like recruitment, performance management, diversity & inclusion, and workforce planning. With the availability of multiple tools in the market, it is easy for organizations to introduce HR metrics and initial practices of HR analytics among people.

Organizations have grown from initial levels of analytics like descriptive and diagnostic analytics to advance level analytics like predictive and prescriptive analytics. It is one of the important tools to understand role of people in value creation in organizations. People data is critical to define the connect between people and performance.

This paper focuses on finding the impact of HR analytics on organizational performance in private sector organizations in India.

Keywords: HR analytics (HRA), organizational performance, people data, people analytics

Introduction

There has been increasing attention on concept of data, analytics, and its application in recent times among professionals and researchers. Researchers and Professionals aim to understand how actionable insights can be derived from data. How these insights from the data lead to improve organizational performance (Chierici, Mazzucchelli, Garcia-Perez, & Vrontis, 2019).

This interest to transform the data into actionable insights is moved into the business domains like marketing, finance, HR and other business departments. This is recently started reflecting in the area of human resource management through implementing data practices in HR (McCartney, Murphy, & McCarthy, 2021).

Earlier the analysis was focused on domains of HR like recruitment and selection, performance management, engagement records etc. in the form of metrics and statistical tools. There has been a shift from working in silos to checking an overall impact of human resources on multiple organizational factors (Huselid, 2018). This research is also based on understanding whether there lies a relation between HR analytics and its factors on organizational performance.

Development of technology, introduction of HRIS systems, availability of cloud platforms, interoperability among different devices, large data storage facilities have provided significant growth to HR analytics (Kim, Wang, & Boon, 2021). With the recent technological advancements, organizations are willingly adopting the newer practices of HR analytics, analysis the data and taking decisions based on the evidence of data. Many of the organizations find it effective in the area of recruitment and selection. It has provided opportunities to address HR issues and improve performance (Simón & Ferreiro, 2018).

This study will identify if there is relation between HR analytics and its factors with organizational performance. Study is limited to private sector organizations.

Review of Literature

HR Analytics

With the information technology transformation, HR departments in the organizations have started to utilize employee data to make data driven decisions in HR areas like talent acquisition, performance appraisals, HR planning, retention etc. (Hamilton & Sodeman, 2020).

In the theoretical terms, HR analytics can be defined as systematic identification of people data and derive business decisions with technological and statistical approach (Margherita, 2022).

As defined by Minbaeva (2017), there are three dimensions to HR analytics, that are, high quality data, analytical competence & strategic ability. Data used in the study should be of high quality, it should be correct, data should be available in real time, there should be consistency in data reporting and should be collected on regular basis. Teams must be well competent in analysis of the data (McCartney, Murphy, & Mccarthy, 2021). For the strategic decisions and implementation of the decisions, managerial support is required.

Organizational performance

It is critical for the professionals and theorists to measure the organizational performance in rapidly changing economic word. In general sense, it is defined as to accomplish the required levels of major stakeholders in the organization (McNeese-Smith, 1996) and assesses the organization's accomplishment (Wall, et al., 2004).

Organizational performance management is a combination of analytical procedures and management into the business. It is supported by technology and allows organizations to define and meet its objectives, manage, and evaluate the performance based on the objectives.

In other terms, it is defined as the ability of an organization to get profit from the available resources and reach to the desired state (Terpilowski, 2022).

For defining the organizational performance, it is important that the organizations focus on objectives it would like to achieve. There are multiple metrics to reach on the exact objective organization wants to achieve. It may include costs, margin rates, people operations, contingency management, overheads etc. It is the mix of financial and non-financial heads. The next stage is to initiate the operations, monitor and optimize and adjust the predictions. This will require planning, statistical analysis, strategic and analytical capabilities (Gu & Luo, 2022).

Research Objectives

This study is to identify the relationship between factors of HR analytics and organizational performance.

Objective 1: To examine the relationship between HR analytics and organizational performance. To achieve the objective mentioned above, following sub-objectives can be stated:

- To examine the impact of HR analytics on organizational performance.
- To examine the impact of high-quality data on organizational performance.
- To examine the impact of analytical competency on organizational performance.
- To examine impact of strategic ability on organizational performance.

Hypotheses

Following hypotheses are derived to reach to objectives:

H₀(1): There is no significant impact of HR analytics on organizational performance.

H₀(2): There is no significant impact of high-quality data on organizational performance.

H₀(3): There is no significant impact of analytical competency on organizational performance.

H₀(4): There is no significant impact of strategic ability on organizational performance.

Research Methodology

Conceptual Framework

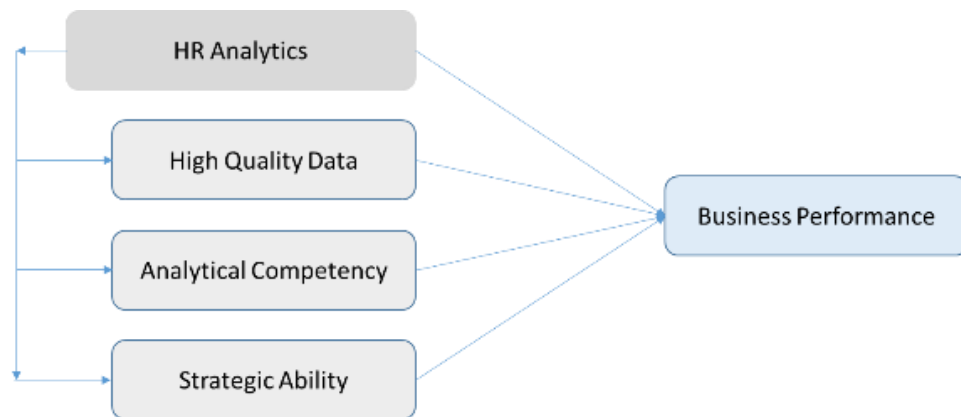


figure 1: Diagrammatic Representation – Conceptual Framework

As the objective suggests, the research finds the relationship between HR analytics and organizational performance, each factor of HR analytics is considered if there lies a relationship between organizational performance across the factors of HR analytics.

Diagrammatic representation (figure 1) above clears the fact that the overall relationship is with HR analytics. It is significant to study whether all the factors of HR analytics have relation with organizational performance or its few factors contributing to the relationship between HR analytics and organizational performance.

For the analysis, following variables are used in the research:

Table 1: Independent and Dependent Variables

Independent Variables	Dependent Variable
HR Analytics High Quality Data Analytical Competency Strategic Ability	Organizational Performance

Research Design

The study is conducted on the basis of quantitative data. The data is collected from respondents and will be calculated with statistical tools to find the relationship between independent variable and dependent variable. It will evaluate the relationship between the HR analytics with organizational performance. It will also assess the relationship between HR analytics factors like high quality data, analytical competency and strategic ability with organizational performance.

Population, Sample Size and Data Collection

The study focuses on individuals working in the field of HR analytics, including those in managerial positions who employ HR analytics and data analysts supporting HR analytics initiatives. This population selected are HR analytics professionals from private sector organizations in India.

Simple random sampling was used for the study as this is a straightforward and unbiased method for selecting samples. It ensures that every individual in the population has an equal chance of being selected.

Population size: The total number of 300 HR analytics professionals were reached to share the responses on the survey.

Desired level of confidence: 95%

Margin of error: The acceptable level of error between your sample estimate was 5%

Sample responded and considered: A total of 236 respondents responded the survey. After data cleaning, responses of 220 employees have been undertaken in the study (Table 1).

Table 2: Frequency Distribution of Questionnaire

Elements	No. of Questionnaire
No. of questionnaire distributed	300
No. of questionnaire collected	236
No. of questionnaire incomplete or with missing values	16
No. of questionnaire (responses) considered	220

Questionnaire on HR analytics and Organizational performance:

The HR analytics scale developed by (McCartney, Murphy, & McCarthy, 2021) was utilized. The HR analytics responses were collected on five-point Likert scale (1=Strongly Disagree to 5=Strongly Agree).

The organizational performance scale utilized in the study is developed by (Miah, 2018). The responses were collected on five-point Likert scale.

Data Analysis

Statistical test Pearson correlation and one-way ANOVA is utilized to study the hypotheses:

H₀(1): There is no significant relationship between HR analytics (HRA) and organizational performance.

Table below has two significant indicators. R value or Pearson correlation value demonstrate the strength of relationship among variables.

Table 3: Summary of Data – HRA and Organizational performance

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.443 ^a	.197	.193	.46868

a. Predictors: (Constant), HRA

There is moderate positive correlation between HR analytics and organizational performance with Pearson correlation (R) value of 0.443 (Table 3, Table 4).

Table 4: Correlation between HR Analytics and Organizational performance

Correlations			
		OP	HRA
Pearson Correlation	OP	1.000	.443
	HRA	.443	1.000
Sig. (1-tailed)	OP	.	.000
	HRA	.000	.
N	OP	220	220
	HRA	220	220

Following is the ANOVA table to understand if there is significant relationship between HR analytics and organizational performance.

Table 5: ANOVA – HR Analytics and Organizational performance

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.717	1	11.717	53.341	.000 ^b
	Residual	47.886	218	.220		
	Total	59.602	219			

a. Dependent Variable: OP

b. Predictors: (Constant), HRA

As per the ANOVA table (Table 5), the p value is less than 0.05. It is .000. The null hypothesis is rejected, and it indicates that there is significant relationship between HR analytics and organizational performance.

H₀(2): There is no significant relationship between high quality data and organizational performance.

The second hypothesis suggests that there is no significant relationship between high quality data and organizational performance. Finding the significance with the correlation table below:

Table 6: Correlation between High Quality Data and Organizational performance

Correlations			
		OP	HRA1
Pearson Correlation	OP	1.000	.428
	HRA1	.428	1.000
Sig. (1-tailed)	OP	.	.000
	HRA1	.000	.
N	OP	220	220
	HRA1	220	220

There is moderate correlation between high quality data and HR analytics (Table 6, Table 7). The same is also clear with summary below.

Table 7: Summary: High-Quality Data and Organizational performance

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.428 ^a	.183	.179	.47256

a. Predictors: (Constant), HRA1

Meanwhile, to find if there exists a relationship, following table of one-way ANOVA explains that:

Table 8: ANOVA: High-Quality Data and Organizational performance

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.920	1	10.920	48.900	.000 ^b
	Residual	48.682	218	.223		
	Total	59.602	219			

a. Dependent Variable: OP

b. Predictors: (Constant), HRA1

The significance value p is less than 0.05. Hence the null hypothesis is rejected and high-quality data and organizational performance are significantly related (Table 8).

H₀(3): There is no significant relation between analytical competency and organizational performance.

With Pearson correlation, let's find the correlation between analytical competency and organizational performance:

Table 9: Correlation: Analytical Competency and Organizational performance

Correlations			
		HRA2	OP
HRA2	Pearson Correlation	1	.352**
	Sig. (2-tailed)		.000
	N	220	220
BP	Pearson Correlation	.352**	1
	Sig. (2-tailed)	.000	
	N	220	220

**, Correlation is significant at the 0.01 level (2-tailed).

There is moderate correlation with values of .352 between analytical competency and organizational performance (Table 9).

The following table one-way ANOVA determined if there is significant relationship between analytical competency and organizational performance.

Table 10: Summary: Analytical Competency and Organizational performance

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.352 ^a	.124	.120	.48942

a. Predictors: (Constant), HRA2

With the R value .352, it verifies that analytical competency and organizational performance are moderately correlated (Table 10).

Table 11: ANOVA: Analytical Competency and Organizational performance

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.385	1	7.385	30.832	.000 ^b
	Residual	52.217	218	.240		
	Total	59.602	219			

a. Dependent Variable: OP

b. Predictors: (Constant), HRA2

With the p-value .000 which is less than 0.05 establishes that null hypothesis is rejected. There is significant relationship between analytical competency and organizational performance (Table 11).

H₀(4): There is no significant relation between strategic ability and organizational performance.

Initially, test the correlation with the Pearson correlation coefficient:

Table 12: Correlation between Strategic Ability and Organizational performance

Correlations			
		HRA3	OP
HRA3	Pearson Correlation	1	.355**
	Sig. (2-tailed)		.000
	N	220	220
OP	Pearson Correlation	.355**	1
	Sig. (2-tailed)	.000	
	N	220	220

** . Correlation is significant at the 0.01 level (2-tailed).

There is moderate correlation between strategic ability and organizational performance (Table 12).

To understand the significant relation between strategic ability and organizational performance, following ANOVA table may help:

Table 13: Summary: Strategic Ability and Organizational performance

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.355 ^a	.126	.122	.48891

a. Predictors: (Constant), HRA3

Model summary provides and verifies the correlation is moderate with a value of 0.355 (Table 13).

Table 14: ANOVA: Strategic Ability and Organizational performance

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.494	1	7.494	31.352	.000 ^b
	Residual	52.108	218	.239		
	Total	59.602	219			

a. Dependent Variable: OP

b. Predictors: (Constant), HRA3

The significance value (p) <0.05. Null hypothesis is rejected. There is significant relation between strategic ability and organizational performance (Table 14).

Research Findings and Discussion

This study demonstrates a significant relationship between HR analytics and organizational performance. It establishes that various factors within HR analytics are directly linked to positive outcomes for organizations. The findings highlight the importance of high-quality data, analytical capabilities, and strategic insights derived from HR analytics in making informed business decisions.

The study's analysis reveals a moderate correlation between specific factors of HR analytics and organizational performance. This suggests that while HR analytics can contribute to improved outcomes, the strength of the relationship may vary depending on the specific factors considered and the context of the organization.

As HR analytics continues to evolve, future studies can explore emerging trends and technologies that may enhance its effectiveness. This includes advancements in data analytics, machine learning, and artificial intelligence. By staying abreast of these developments, organizations can leverage the latest tools and techniques to extract maximum value from their HR data.

In conclusion, this study provides valuable insights into the relationship between HR analytics and organizational performance. While the findings highlight the potential benefits of HR analytics, further research is needed to fully understand its impact and identify best practices for implementation. By investing in HR analytics and leveraging its capabilities, organizations can make data-driven decisions that drive improved performance and achieve their strategic objectives.

Limitations and Conclusion

This study contributes to the growing body of research on the relationship between HR analytics and organizational performance. While limitations such as the duration of response collection and sample size should be acknowledged, the findings align with contemporary research in this field. The study's results provide further evidence supporting the positive correlation between HR analytics factors and organizational outcomes.

One area for future research is to delve deeper into specific organizational performance dimensions impacted by HR analytics. While previous studies have identified general correlations, future research could focus on more granular aspects such as productivity, employee satisfaction, or customer loyalty. This would provide a more nuanced understanding of how HR analytics can drive specific business outcomes.

Another area for future exploration is the development of alternative theoretical frameworks to explain the relationship between HR analytics and organizational performance. While existing theories provide valuable insights, new frameworks could offer fresh perspectives and deepen our understanding of this complex relationship.

In addition to theoretical frameworks, the development of more comprehensive and up-to-date scales to measure HR analytics implementation is essential. Existing scales may not fully capture the nuances of HR analytics practices in today's organizations. By developing more robust measurement tools, researchers can gain a more accurate assessment of the level of HR analytics adoption and its impact on organizational performance.

Overall, this study contributes to the ongoing research on HR analytics and its relationship with organizational performance. By addressing the identified limitations and exploring future research directions, researchers can continue to advance our understanding of this critical area and its implications for organizations.

Recommendations

To maximize the benefits of HR analytics and drive improved organizational performance, organizations should prioritize several key areas. First, investing in data quality is crucial for ensuring that HR data is accurate, consistent, and accessible for analysis. By implementing data governance practices and investing in data infrastructure, organizations can create a solid foundation for effective HR analytics.

Second, developing analytical capabilities within the HR team is essential for extracting meaningful insights from HR data. Training HR professionals in data analysis techniques and tools, fostering a data-driven culture, and collaborating with data scientists can enhance the organization's ability to leverage HR analytics effectively.

Third, focusing on key HR metrics that align with organizational objectives is critical for measuring the impact of HR initiatives. By tracking and analyzing key performance indicators (KPIs) related to employee engagement, talent acquisition and retention, and productivity, organizations can identify areas for improvement and make data-driven decisions.

Fourth, leveraging advanced analytics techniques, such as machine learning and artificial intelligence, can uncover hidden patterns and insights in HR data that may not be apparent through traditional analysis methods. By utilizing data mining techniques, organizations can identify trends and anomalies that may impact organizational performance.

Finally, integrating HR analytics into decision making at all levels of the organization is essential for driving positive change. By developing data-driven HR strategies and using HR analytics to support evidence-based decision making, organizations can ensure that HR initiatives are aligned with overall business objectives and contribute to organizational success.

By implementing these recommendations, organizations can enhance the impact of HR analytics on organizational performance, drive innovation, and achieve sustainable competitive advantage.

References

- Chierici, R., Mazzucchelli, F., Garcia-Perez, A., & Vrontis, D. (2019).** Data analytics and its impact on organizational performance. *Journal of Business Research*, 98, 34-45. <https://doi.org/10.1016/j.jbusres.2019.01.012>
- Gu, Y., & Luo, J. (2022).** Organizational performance: The interplay of financial and non-financial metrics. *International Journal of Productivity and Performance Management*, 71(5), 1501-1516. <https://doi.org/10.1108/IJPPM-05-2021-0216>
- Hamilton, K., & Sodeman, W. (2020).** The role of HR analytics in data-driven decision making. *Human Resource Management Review*, 30(2), 120-130. <https://doi.org/10.1016/j.hrmr.2019.100705>
- Huselid, M. A. (2018).** The workforce advantage: How to achieve competitive advantage through people. *Academy of Management Perspectives*, 32(1), 34-51. <https://doi.org/10.5465/amp.2016.0153>
- Kim, Y., Wang, Y., & Boon, J. (2021).** The evolution of HR analytics: Current trends and future directions. *Journal of Human Resource Management*, 9(3), 45-62. <https://doi.org/10.11648/j.jhrm.2021.09.03.12>
- Margherita, A. (2022).** HR analytics: The new frontier in talent management. *Journal of Business Research*, 130, 590-596. <https://doi.org/10.1016/j.jbusres.2021.03.019>
- McCartney, M., Murphy, E., & McCarthy, E. (2021).** HR analytics: The bridge between data and decision-making. *Human Resource Development Quarterly*, 32(2), 139-156. <https://doi.org/10.1002/hrdq.21430>
- Minbaeva, D. (2017).** The role of HR analytics in organizational performance. *Journal of Organizational Behavior*, 38(3), 401-417. <https://doi.org/10.1002/job.2190>
- McNeese-Smith, D. (1996).** The influence of professional practice on organizational performance. *International Journal of Human Resource Management*, 7(1), 82-94. <https://doi.org/10.1080/0958519960001>
- Simón, T., & Ferreira, J. (2018).** Leveraging HR analytics for strategic decision making. *Journal of Strategic Human Resource Management*, 7(1), 17-28. <https://doi.org/10.21654/jshrm.7.1.2>
- Terpilowski, M. (2022).** Understanding the metrics of organizational performance. *Management Review Quarterly*, 72(1), 79-100. <https://doi.org/10.1007/s11301-021-00232-7>
- Wall, T. D., Wood, S. J., & Michie, J. (2004).** The meaning of high-performance work system. *The International Journal of Human Resource Management*, 15(7), 1303-1321. <https://doi.org/10.1080/0958519042000253406>

Empowering Institutions and Clients: Unleashing Financial Innovation

Dr. Vishal Goel

Associate Professor, Head of the
Department of Innovation and
Entrepreneurship, Swarnim Startup and
Innovation University, Gandhinagar, India.

Abstract

The paradigm shift that has occurred in the financial industry is a direct result of recent advancements in the fields of finance and analytics. Customers of financial institutions have become more familiar with a wide range of possibilities and difficulties because of this scenario. Within the scope of this research, an attempt is made to comprehend the concept of financial innovation and how the alterations brought about by innovation affect both the clients of financial institutions and the institutions themselves. The entire investigation relies on past data. The research will concentrate on three core areas: the management of risk, the decision-making process about investments, and the provision of financial service and goods. The focus of this paper is to establish the framework for further inquiry into the ways in which releasing financial ingenuity accelerates institutions and empowers customers in the financial sector. According to the research findings, innovations within the finance discipline have significantly affected the financial industry. New financial goods and services, better methods of handling risks, and new ways of looking at investment strategy selection are all direct results of this. Additionally, new perspectives have emerged. However, this has also resulted in the emergence of new challenges for the firms that provide financial services and the customers they serve, particularly an increase in the level of complexity and the chance of risk.

Keywords: Financial Innovation, Financial Institutions, Risk Management, Financial Products and Services, Investment Decision-Making.

Introduction

The financial industry has been significantly affected by digitalization in recent years, as demonstrated by the emergence of "FinTech" (Zavolokina, Dolata and Schwabe, 2016a). In the age of digital transformation, fintech has effortlessly integrated into our daily lives (Cumming, Johan and Reardon, 2023). The term "fintech" is an amalgamation of the words "finance" and "information technology" (Zavolokina, Dolata and Schwabe, 2016b; Ojiaku et al., 2024). By illustrating the revolutionary impact of recent fintech advancements on the financial services industry, it underscores the importance of established businesses to adjust to changes in the industry (Gomber et al., 2018). Financial institutions have successfully expanded their presence into new sectors, reduced expenses, improved operational efficiency, and generated innovative new services (Leong, 2018; Ozili, 2018). Many of the recent developments that have taken place in the industry of finance are denoted as "financial innovations," which is a phrase that is used to refer to a wide variety of these developments. A lot of recent shifts in the financial sector may be traced back to developments in financial services. Because of these innovations, banks and other financial organisations are now better able to meet the ever-evolving expectations of their customers by providing better solutions to the problems that they face (Allen, Mcandrews and Strahan, 2002; Rajan, 2005; Gomber et al., 2018). In spite of this, new threats and challenges have materialised as a direct consequence of advances in the financial industry. Because of these dangers and problems, there have been substantial repercussions for financial institutions as well as for the customers that these institutions are tasked with serving (Frame and White, 2012; Gomber et al., 2018; Lee and Shin, 2018a). Academics and finance practitioners share a keen interest in the impact of new financial products and services on existing businesses and customers. Through an examination of secondary data, the aim of this paper is to explore the impact that technological advancements in the financial industry have had not only on businesses but also on the clients of such businesses. The investigation will centre on three crucial aspects: the management of risks, the process of making investment decisions, and financial services and products. What are the main areas of financial innovation, how have financial institutions and clients been affected by financial innovation, and what are the implications of financial innovation for institutions and clients are the research questions of this study? By answering these research questions, this study looks at the problems and potential of financial innovation, along with how financial institutions can use it to improve services and meet customer needs.

In the first section, we looked at the bigger picture of this study and the questions we set out to address. Section 2 discusses an analysis of the relevant work on financial innovation and its related aspects, as well as the

research gap. The research approach employed in the work is discussed in Section 3. The idea of financial innovation is explored in Section 4. In addition to outlining the many forms of financial innovation, this article analyzes and explores the three main areas of financial innovation: investment decision-making, financial goods and services, and risk management. Further, this section has also covered the effects and implications of financial innovation on institutions and clients. In Section 5, we talk about a discussion that came about because of the previous section's analysis. In Section 6, I draw attention to the study's shortcomings and offer some suggestions for future research. Future research in this field will greatly benefit from the study's findings, and the study's findings will add to financial innovation's impact on financial sector literature.

Review of Literature

As we have seen, financial innovation has changed the financial industry. This gives financial institutions and their clients both new opportunities and challenges. However, I was unable to locate a single research that dealt with all of the facets of financial innovation at once. However, there have been attempts to demonstrate some of the findings that the various research scholars have gathered, such as financial innovation (new goods and services), investment decision-making and risk management are as follows:

Financial Products and Services

Several studies have been conducted to study various elements of the effects that innovations in the financial sector have on institutions and the customers they serve. Much of the available literature focuses on how financial innovations have affected these types of goods and services. There have been tremendous shifts in the financial sector during the past few decades (Franklin. and Anthony, 1997), characterised by the emergence of novel services, products, and technologies in the financial sector (Arner, Barberis and Buckley, 2015). Because of technological progress, new goods and services in the financial sector have materialized, i.e., peer-to-peer lending, digital payments, and robo-advisory services. Other examples include securitization, derivatives, and digital trading platforms. These developments have allowed financial institutions to provide services that are more efficient and customised to each individual customer's demands (Chiu, 2016; Guo and Liang, 2016; Dabrowski, 2017; Gomber et al., 2018; Anshari, Almunawar and Masri, 2022). For instance, the advent of electronic trading platforms has resulted in decreased transaction costs and more transparency in financial markets. This has made it possible for investors to trade securities at reduced costs and with greater simplicity (Allen, Mcandrews and Strahan, 2002; Claessens, Glaessner and Klingebiel, 2002). As a consequence of the financial sector's constant innovation process, both possibilities and challenges have emerged (Gomber et al., 2018). However, difficulties with product complexity, information transparency, and consumer protection have also arisen due to the creation of innovative goods and facilities (Ahmed, 2009; Anagnostopoulos, 2018).

Risk Management

Research has also been done looking at how the introduction of new financial technologies impacts risk management. Technology advancements in the finance sector, such as algorithmic trading and machine learning (Hendershott et al., 2021), Value at Risk (VaR) and stress testing (Martinez Peria et al., 2001). The capacity of financial institutions to handle risk has increased as a result of new risk management strategies that have emerged in recent years (Leo, Sharma and Maddulety, 2019). An example of a statistical method is the VaR, or value at risk, technique, which calculates the maximum possible loss of a financial instrument or investment could incur over a specified time horizon with a defined level of confidence (Martinez Peria et al., 2001). The term "stress testing" is used to describe the process by which a financial organisation assesses the potential impact of extreme events on its balance sheet (Huang, Zhou and Zhu, 2009). Data privacy and cyber security threats have expanded in response to these innovative methods (Ahsan et al., 2022). One such example is the rise of new threats like flash crashes and market manipulations due to the popularity of algorithmic trading (Bhupathi, 2010; Lange, Lenglet and Seyfert, 2016; Dalko, V. and Wang, 2020). Financial institutions must therefore continuously improve their risk management procedures if they want to stay up with the financial market's dynamic character.

Investment Decision-Making

An additional area of inquiry focuses on the impact that financial innovation has on the investing decisions that individuals make. New investment alternatives, such as cryptocurrency and alternative investments, have emerged as a consequence of financial innovation, posing a challenge to conventional investing strategies (Lerner and Nanda, 2020; Xi, O'Brien and Irannezhad, 2020; Li et al., 2021). The emergence of new investment strategies, such as smart beta and factor investing, has made it possible for investors to improve the degree to which their portfolios are diversified and to earn higher returns (Fredrik Kristoffersson, 2017; Becker and Reinganum, 2018). The goal of smart beta approaches is to beat the conventional market capitalization-weighted indices by investing in a portfolio of companies that is differentiated from the benchmark by certain factors,

such as value or momentum (Siracusano, 2014; Silvasti, Grobys and Äijö, 2021). Concerns have been raised regarding quantitative investment strategies and the influence they may have on the financial markets (Joyce et al., 2011). Some academics, for example, have claimed that the growing popularity of passive investing may contribute to a loss in market efficiency and liquidity (Turner and Sushko, 2018; Anadu et al., 2020). So, it's important for financial institutions, and investors must carefully consider the potential rewards and drawbacks of employing new investment strategies.

Research Gaps

There are not many studies that use secondary data to examine how financial innovation affects businesses and consumers. There needs to be a more comprehensive look at the effects of financial innovation, as many previous studies have only covered certain topics. This research utilises secondary data analysis to fill the knowledge gap about how financial innovation affects companies and their clients.

Research Methodology

This research is undertaken to better understand the concept of financial innovation and its discourse in academic literature. As we explore the realms of financial innovation, institutional dynamics, and client empowerment, we navigate this research journey guided by the rich tapestry of secondary data sources that serve as the foundation for our investigation. The study has taken the secondary data on FinTech survey conducted by EY in 2019. This survey, which was conducted from February 4 to March 11, 2019, comprises 27,103 interactions with digitally active adults in 27 global markets, including the United States, United Kingdom, Australia, Brazil, China, India, and Argentina. Furthermore, this conceptual study investigates how financial innovation affects the clients of financial organizations. The data sources encompass scholarly journals, industry reports, and other relevant publications.

Financial Innovation

Many forms of financial services have begun to leverage fintech, or financial innovations made possible by digital technology. While financial technology breakthroughs are nothing new, (Dermine, 2016). The word "fintech" is shorthand for "financial technology," which encompasses a wide variety of innovations aimed at enhancing both the delivery and consumption of financial services by businesses (Mention, 2019). Nevertheless, Arner et al., (2015), identified and described three distinct phases of the emergence of FinTech. The traditional financial services sector is referred to as FinTech 1.0, while the digital sector is referred to as FinTech 2.0, and FinTech 3.0 denotes the subsequent iteration of financial technology. He stressed the fact that technology improvements play a big role in the financial services industry, which is highly dependent on those advancements. Market volatility, new laws, and technical developments are the key forces pushing the financial services sector towards innovation (Laeven, Levine and Michalopoulos, 2015; Chiu, 2016). Financial institutions have benefited from innovation in the financial sector since it has helped them boost profits, broaden their customer base, and lower operational expenses (Lee and Shin, 2018a; Ozili, 2018). The subsequent paragraphs will discuss the various forms that financial creativity i.e., innovations in the financial sector can take.

Types of Financial Innovation

Based on our newfound knowledge of the term, we can categorise financial innovations into four types: product, process, organisational, and marketing innovations (Atalay, Anafarta and Sarvan, 2013a; Lee, Lee and Garrett, 2019). Because there are four sub-types of innovative

financial practices, it is necessary for us to have an individual comprehension of each one. The process of developing new financial goods or improving upon those that already exist is referred to as "financial product innovation" in the banking and finance business. This is done to meet the ever-evolving requirements of clients. Developing new financial products or altering current ones to better meet changing customer needs is referred to as product innovation. The creation of innovative processes that improve the effectiveness and efficiency of financial services is known as process innovation. Changes to the structure, culture, or management procedures of financial institutions are a part of organisational innovation, which aims to make them more competitive. Utilizing fresh marketing tactics or distribution methods to advertise financial products and services is known as marketing innovation (Atalay, Anafarta and Sarvan, 2013b). The meaning of these various forms of financial breakthroughs can be made more clear by looking at their applications in the actual world. The different kinds of financial innovations that have come out in the past few years are listed in Table 1.

Table 1: Financial Innovation Examples

Innovation	Description
Mobile banking	Services provided by banks that are accessible via mobile devices and so make banking easier.
Crowd funding	A technique of financing that facilitates the raising of capital via numerous, comparatively small investments from a large number of people.
Crypto currencies	Cryptographic techniques are used to ensure the safety of digital currencies, which therefore make it possible to conduct decentralised transactions.
Robo-advisors	Financial advisory and portfolio management services provided by algorithm-based digital platforms.
Peer-to-peer lending	Online platforms that facilitate the connection between borrowers and lenders, bypassing traditional financial institutions.
High-frequency trading	Trading that is done by computer. Algorithms are used to analyse and make trades quickly, allowing for quick gains.
Machine learning	Investing decisions can be made using machine learning algorithms to analyse market trends and patterns in historical data.
Social trading	Investors can use social trading platforms to follow and replicate the investment tactics of other successful traders.
Blockchain Technology	Payments, contracts, and other areas can all benefit from distributed ledger technology, which allows for the transparent and secure recording of transactions involving numerous parties.
Quantum Computing in Finance	Maximizing the use of quantum computing to address intricate financial issues, such as risk assessment and portfolio optimization
Generative AI	Generative AI, represents a significant advancement in artificial intelligence technology that has been rapidly adopted in the financial sector due to its enhanced utility.

Source: Author Compilation

Financial innovation encompasses a wide variety of products and services, mobile banking (Al-Jabri and Sohail, 2012); Crowd funding (Rossi, 2014); Crypto currencies (Crosby et al., 2016); Robo-advisors (Dyba and Gernego, 2019); Peer-to-peer lending (Yuliya Komarova Loureiro and Laura Gonzalez, 2015); High-frequency trading (Goldstein, Kumar and Graves, 2014); Machine learning (Shah, Isah and Zulkernine, 2019); and Social trading (Berger, Wenzel and Wohlgemuth, 2018; Glaser and Risius, 2018), Blockchain Technology ((Gutlapalli, 2016; Mills et al., 2016; Natarajan, Krause and Gradstein, 2017; Li and Kassem, 2021), Quantum Computing in Finance (Egger et al., 2020; Bova, Goldfarb and Melko, 2021; Griffin, Sampat and Griffin, 2021; Herman et al., 2022; Naik et al., 2023) and Generative AI (Shabsigh and Boukherouaa, 2023). The table identifies the particular innovation and gives a brief overview of each. Examples of product innovation include crypto currencies and robo-advisors, where new financial products have been developed to meet shifting consumer needs. Peer-to-peer lending is an example of process innovation, where a new process has been developed to connect borrowers and lenders directly, and bypassing traditional financial institutions. Examples of organisational innovation that have led to the widespread adoption of computerised trading in the financial sector include high frequency trading and social trading. Blockchain technology signifies a technological innovation, introducing decentralized and transparent transactional systems. Similar to cryptocurrencies, blockchain technology revolutionizes traditional financial processes by providing secure and efficient methods of recording and verifying transactions. It demonstrates product innovation by presenting a new financial infrastructure that satisfies the requirement for transaction transparency, security, and decentralization. Quantum computing in finance uses quantum mechanics to optimize risk assessment and portfolio management, a technological breakthrough. Furthermore, GenAI has the potential to exacerbate existing risks and introduce new ones, which could impact the stability of the financial sector. Financial technology has improved, enabling more complicated analysis and decision-making. Quantum computing could change financial decision-making and meet modern finance's growing complexity. Finally, mobile banking promotes financial services via mobile devices, demonstrating marketing creativity.

These illustrations show how new ideas in the financial sector have resulted in game-changing products, procedures, and approaches that have benefited both the financial sector and its customers. Certain places across

the world are being recognised as innovation hotspots as innovation in finance has increased. The Global Financial Centers Index (GFCI 34) , the thirty-four version, came out on September 28, 2023. GFCI 34 ranks 121 financial centers around the world and rates their future competitiveness. Policymakers and people who make business decisions can use the GFCI as a useful guide. Based on the Global Financial Centers Index (GFCI 34), Table 2 lists the top international financial innovation centres along with regional rankings for each centre, along with the rank and ratings as per the GFCI 32 .

Table 2: Top Global Financial Innovation Hubs

Centre	GFCI 34 Rank	GFCI 34 Rating	Region	Centre	GFCI 32 Rank	GFCI 32 Rating	Region
New York	1	763	North America	New York	1	760	North America
London	2	744	Western Europe	London	2	731	Western Europe
Singapore	3	742	Asia/Pacific	Singapore	3	726	Asia/Pacific
Hong Kong	4	741	Asia/Pacific	Hong Kong	4	725	Asia/Pacific
San Francisco	5	735	North America	San Francisco	5	724	North America
Los Angeles	6	734	North America	Shanghai	6	723	Asia/Pacific
Shanghai	7	733	Asia/Pacific	Los Angeles	7	722	North America
Washington DC	8	732	North America	Beijing	8	721	Asia/Pacific
Chicago	9	731	North America	Shenzhen	9	720	Asia/Pacific
Geneva	10	730	Western Europe	Paris	10	719	Western Europe
Seoul	11	729	Asia/Pacific	Seoul	11	718	Asia/Pacific
Shenzhen	12	728	Asia/Pacific	Chicago	12	717	North America
Beijing	13	727	Asia/Pacific	Sydney	13	716	Asia/Pacific
Frankfurt	14	726	Western Europe	Boston	14	715	North America
Paris	15	725	Western Europe	Washington DC	15	714	North America
Luxembourg	16	724	Western Europe	Tokyo	16	713	Asia/Pacific
Boston	17	723	North America	Dubai	17	712	Middle East & Africa
Zurich	18	722	Western Europe	Frankfurt	18	711	Western Europe
Amsterdam	19	721	Western Europe	Amsterdam	19	710	Western Europe
Tokyo	20	720	Asia/Pacific	Geneva	20	709	Western Europe

Source: The Global Financial Centres Index 32 & 34 page 4

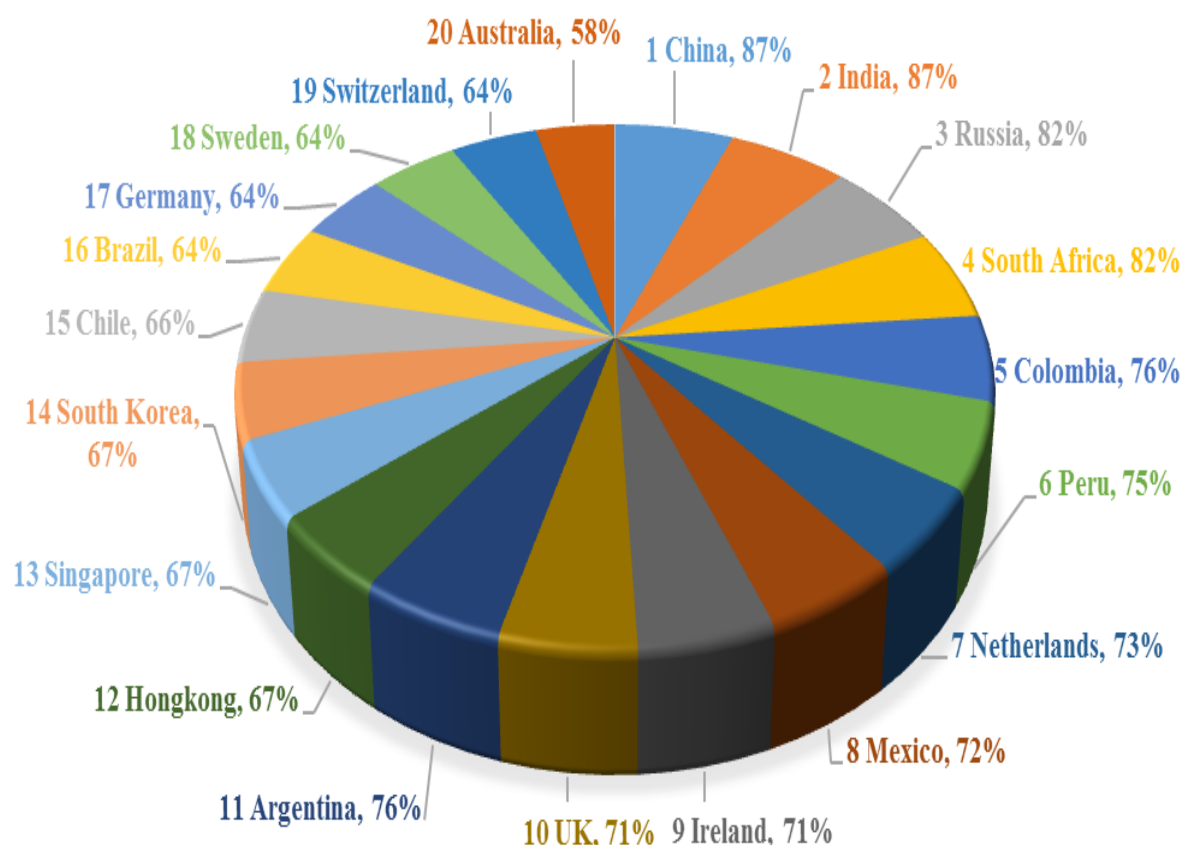
These financial innovation centres attract entrepreneurs, venture capitalists, and existing financial institutions. The Global Financial Centers Index (GFCI) ranks financial centers around the world by how competitive they are. There are many factors that go into the scores, such as human capital, the development of the financial sector, infrastructure, business environment, reputation, and a general measure (Wardle and Mainelli, 2023).

The table shows that New York retains its position as the top financial centre in the world with a score of 763. London, Singapore, Hong Kong, and San Francisco have retained their second, fourth and fifth positions with scores of 744, 742, 741 and 735 respectively. Los Angeles and Shanghai have slipped down to sixth and seventh positions with scores of 734 and 733, respectively. Washington DC, has taken the lead with 732 points, and it shifts to the eighth position instead of the 15th position as it was in the GFCI 32 ranking. In place of Shenzhen and Paris, Chicago and Geneva have emerged in the top ten position. Chicago and Geneva are placed in ninth and tenth positions with 731 and 730 points, respectively. The financial centres are categorised into five regions, i.e., Asia/Pacific region; Eastern Europe; North America; Western Europe and Central Asia; and the Middle

East and Africa. According to GFCI 34, seven centres in Western Europe rank among the top 20. With an additional rating point over Hong Kong, Singapore maintains its lead in the region. Additionally, Shanghai is among the top ten globally. Prominent Chinese centres maintained their positions in the rankings, whereas numerous centres within China experienced upward movement, whereas five centres outside of China experienced declines of ten places or more in the rankings. In the current edition of the index, Washington, DC, ranked alongside, Chicago, Los Angeles, New York and San Francisco among the top 10 globally (Wardle and Mainelli, 2023). The high rate of financial technology adoption by firms and consumers in these hubs is one of the main forces behind financial innovation (Mazambani and Mutambara, 2020; Carbó-Valverde, Cuadros-Solas and Rodríguez-Fernández, 2022; Muganyi *et al.*, 2022).

How the different countries adopted global financial technology is reflected in Figure 1, which thereby shows the global fintech adoption rate by country.

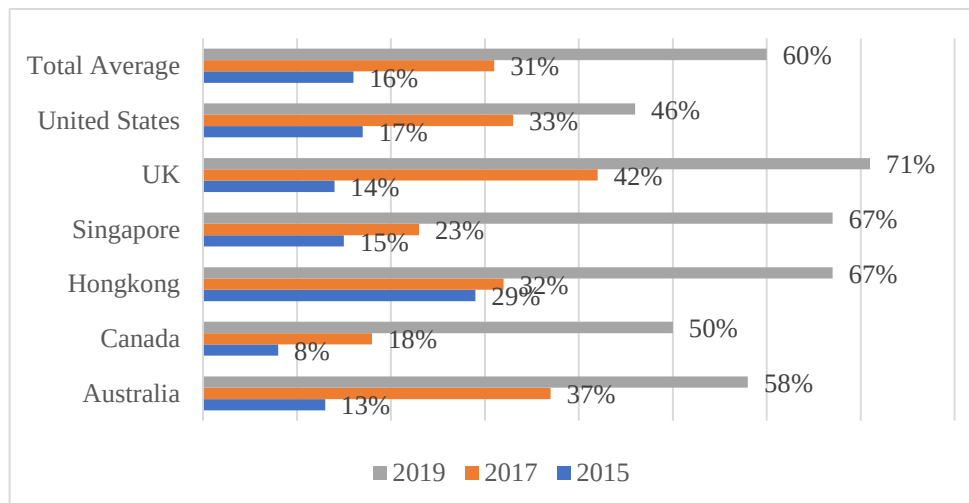
Figure 1: Fintech Adoption Rate (%)



Source: EY Global FinTech Adoption Index 2019

The figure 1 reflects the proportion of digitally perceptive customers who have utilised no less than two financial technology products in the preceding year. EY performed a global assessment on FinTech adoption trends across markets, demographics, and time. The study interviewed consumers in 27 markets across the globe, i.e., Hong Kong, India, Germany, Canada, Chile, Luxembourg, France, Belgium, China (mainland), Argentina, Brazil Australia, Colombia etc. (Ernst & Young, 2019b). The adoption rates of fintech are highest in India and China, at 87%, and lowest in South Africa and Russia at 82%. The figure shows that many emerging economies have high FinTech adoption rates, indicating a strong demand for financial innovation in these countries (Zalan and Toufaily, 2017; Kowalewski and Pisany, 2020). At 73%, the Netherlands has the greatest rate of FinTech adoption among developed economies. Other established economies, i.e., the United Kingdom, Ireland, and Germany, also have relatively high FinTech adoption rates, indicating that financial innovation is gaining momentum in these nations as well. Because of their advanced financial infrastructure, significant Asian economies like Hong Kong, Singapore, and South Korea have comparatively high adoption rates for fintech (Sedik *et al.*, 2019). Figure 2 displays the results of an EY comparison of the adoption of FinTech in six different major economies.

Figure-2 FinTech Adoption Patterns in Six Major Economies



Source: Global FinTech Adoption Index 2019 Page 8

The six markets surveyed by EY— the United Kingdom, Canada, Australia, the United States Hong Kong, and Singapore —had an adoption rate that increased from 16% in 2015 to 31% in 2017 and 60% in 2019. In general, the data indicates that FinTech is becoming more and more popular worldwide, with rising adoption rates in both emerging and developed nations. Risk management and financial innovation are covered in the discussion that follows.

Risk Management

The increased complexity and potential risks associated with new financial products and services have made effective risk management a top priority for financial institutions (Franklin. and Anthony, 1997). When it comes to addressing the complex risks that innovative financial products pose, conventional risk management techniques might not be sufficient. Due to the increased complexity and risk that are linked with these new financial innovations, it is necessary for financial institutions to adapt their strategies towards risk management (Arner, Barberis and Buckley, 2015; Gomber et al., 2018). As a direct consequence of this, financial institutions were required to adjust their risk management strategies so that they could remain competitive in the new climate (Guo and Liang, 2016; Gomber et al., 2018). The development of novel risk assessment methods, big data analytics for risk identification, and blockchain technology for increased security and transparency are examples of financial innovation in risk management (Dicuonzo et al., 2019; Etemadi et al., 2021; Lee et al., 2021).

Another way that financial institutions are enhancing their capability for risk management is through the use of artificial intelligence (AI) and machine learning (ML) (Kshetri, 2021; Pandey and Sergeeva, 2022; Sharbek, 2022). Specifically, both (Chitra and Subashini, 2013; Thennakoon et al., 2019) have pointed out how ML algorithms might aid in the detection and prevention of fraud by analysing patterns in financial transactions. Financial institutions are enhancing their risk management practises by, among other things, implementing ML or machine learning and AI. For instance, ML systems can help in the fight against fraud by analysing patterns in transaction data. The same is true for the specialist risk management advice that AI-powered chatbots can provide to their customers (Malali and Gopalakrishnan, 2020).

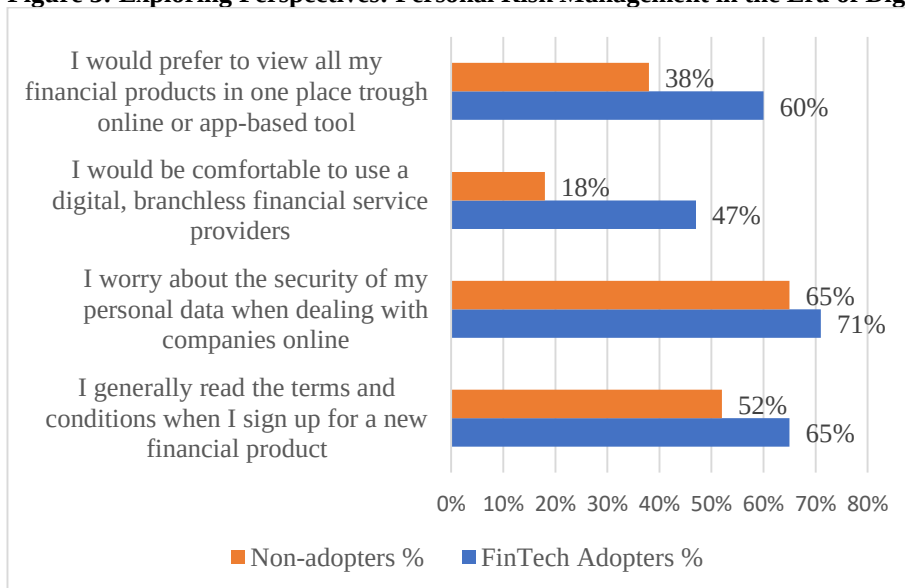
In order for financial institutions to keep up with the fast speed of change brought on by new financial innovations that raise both complexity and risk, these institutions have been required to make adjustments to the risk management strategies they employ. Financial organisations have used a variety of risk management approaches to efficiently manage the risks involved with new financial products and services. Examples of such techniques are presented in Table 3, including diversification (Hitt, 1994); hedging (Koonce, Lipe and McAnally, 2005; Ahmed, 2015); stress testing (Martinez Peria et al., 2001); value-at-risk (VaR) (Jorion, 1996; Benninga and Wiener, 1998); collateral management (Domanski and Neumann, 2001; Shaik, 2014); and Scenario analysis (Schoemaker, 1991). By assessing potential losses, keeping an eye on collateral that counterparties have pledged, and estimating probable losses, these techniques help to mitigate credit risk and reduce risk exposure. As innovative financial services and products continue to emerge, financial establishments will need to continually reassess and adapt their risk management strategies to ensure effective risk management.

Table 3: Examples of Risk Management Techniques in Financial Institutions

Technique of Risk Management	Description
Diversification	To lessen the impact of potential losses, diversifying investments across several industries, geographies, and asset classes
Hedging	Making use of financial tools to mitigate possible losses caused by unfavourable pricing changes
Stress testing	Evaluating the impact of hypothetical adverse events on a portfolio or institution
Value-at-Risk (VaR)	Calculating the probability of a portfolio's value decreasing throughout a specific time frame while maintaining a degree of certainty
Collateral management	Monitoring and valuing collateral pledged by counterparties to mitigate credit risk
Scenario analysis	Analyzing how various economic outcomes could affect financial decisions

Source: Author Compilation

Challengers are using technology and agility to deliver personalised and accessible FinTech solutions, altering financial services. Companies must understand FinTech adopters' preferences and security concerns to succeed in this changing landscape. Financial institutions must understand client risk management attitudes to stay up with innovative financial products and services (Ernst & Young, 2019b). As the world of innovative financial goods and services is constantly evolving, it is essential for financial institutions to understand client sentiment around risk management (Allioui & Mourdi, 2023; Y. Li, 2024; Shrestha et al., 2024). Our research reveals the dynamic interaction between digital financial innovation and risk perceptions. We found that financial institutions must instantly change their risk management procedures to address the challenges and uncertainties of new financial goods and services, but it also illuminates clients' changing tastes and fears. "Exploring Perspectives: Personal Risk Management in the Era of Digital Finance" (figure 3) graphically depicts various perspectives. Specifically, it shows that those who have adopted FinTech are more likely to use digital financial services, but they are more worried about the safety of their personal data than those who have not. This contrast highlights the fine line that banks and other financial organisations must walk between being innovative and being too cautious if they want to keep their customers' trust (Adarbah and Al-Badi, 2023; Uchenna Innocent Nnaomah *et al.*, 2024). Navigating this ever-changing market, resolving customer concerns, and encouraging increased acceptance of digital financial services can be achieved by financial institutions that leverage technology and agility to provide personalised and accessible FinTech solutions (Jabbar, 2023; Kayode, 2023).

Figure 3: Exploring Perspectives: Personal Risk Management in the Era of Digital Finance

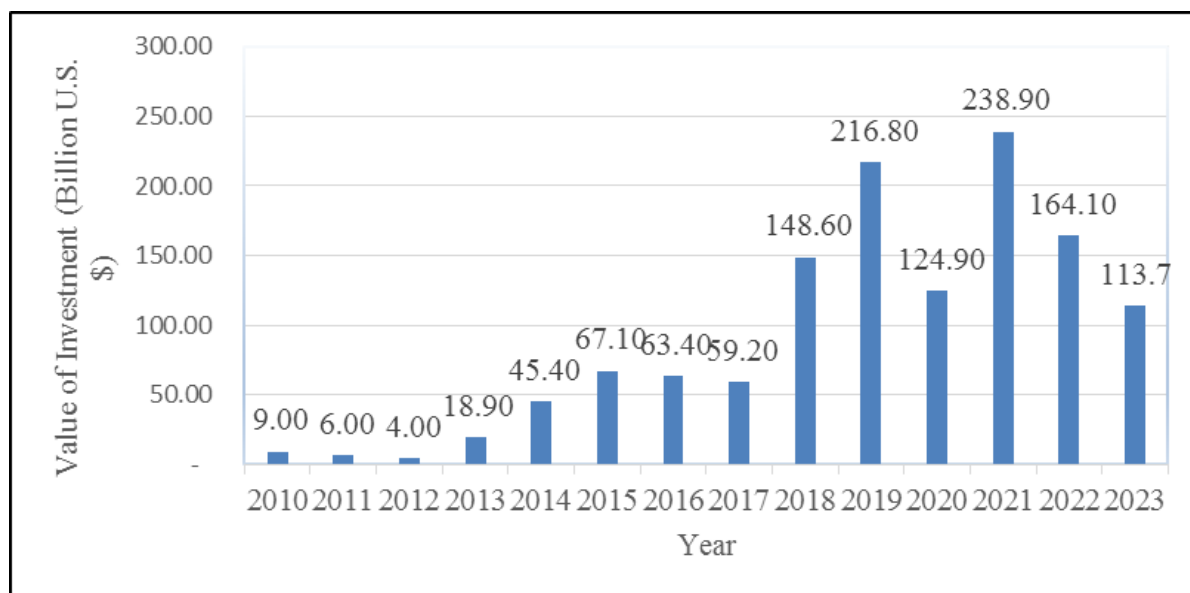
Source: Global FinTech Adoption Index 2019 page 11

Investment Decision Making

An integral part of effective risk management is forming well-informed investment strategies, in addition to recognising and eliminating potential threats (Errico, L., & Sundararajan, 2002). Risk management in financial institutions requires investment decision-making. Financial institutions must carefully consider investment risks and profitability. Hence, financial institutions must integrate risk management and investment decision-making to make an informed decisions that support their long-term goals while controlling risks (Cumming and Hirtle, 2001). Financial institutions can't achieve this integration without fast and reliable data on market developments, economic conditions, and new risks (Armstrong, 2005; Rajan, 2005). Big data analytics and AI have simplified the process by which banks and other financial organisations collect, analyse, and interpret massive volumes of data in order to better inform their investment and risk management choices (Seddon and Currie, 2017; Gomber et al., 2018). Financial institutions must thoroughly evaluate possible investments in order to assess their profitability and potential hazards (Errico, L., & Sundararajan, 2002). Financial institutions make investment decisions using a variety of methodologies, such as fundamental and technical analysis, and quantitative modelling (Schoemaker, 1991; Jackson, 2010). Furthermore, financial institutions must be informed of the most recent financial developments and how they affect investment decisions (Gomber et al., 2018; Lee and Shin, 2018b; Ozili, 2018). Exchange-traded funds, i.e., ETFs, which give investors an understanding of a wide range of asset classes, are one example of the new investment opportunities and products that have been made possible as a direct result of innovations in the field of finance (Kosev and Williams, 2011).

The introduction of new financial innovations has, on the other hand, resulted in the emergence of new dangers, such as the possibility of manipulating markets and of systemic risks (Rajan, 2005; Arner, Barberis and Buckley, 2015). KPMG reports that between 2017 and 2018, global investment in the financial technology sector increased to an all-time high of \$111.8 billion (Agarwal, 2019; Everhart, 2020). Figure 4 in the following section, however, shows global fintech investment from 2010 to 2023. This underlines how important it is to research the impact that financial innovation has on the decision-making process regarding investments. The long-term sustainability of financial institutions depends on effective risk management, which is a crucial aspect of investment decisions. Adopting diverse investment decision-making processes and staying abreast of the latest changes in the financial industry can help financial institutions lower their risk exposure and increase their returns on investment.

Figure 4: Global FinTech Investment



Source: Statista

Effects of Financial Innovation on Financial Institutions

The world of finance has seen the effects of innovation, both good and bad. Efficiency gains, profit maximization, and cost reductions are all good outcomes of recent financial innovations (Laeven, Levine and Michalopoulos, 2015; Beck et al., 2016). Automation of financial institutions' processes, reduced reliance on physical infrastructure, and expanded geographic reach have all been made possible by innovations in the financial sector (Loo, 2018; Boot et al., 2020; Chang, Luo and Chen, 2020; Hamledari and Fischer, 2021).

Financial innovation has also enabled financial institutions to offer their clients brand-new goods and services that are customised to meet their changing needs (Lee and Shin, 2018b). New risks and challenges have emerged as a result of financial innovation. These include heightened vulnerability to market fluctuations and diminished safeguards for consumers (Turan, 2015; Vučinić, 2020).

Effects of Financial Innovation on Clients

Innovations in the financial sector have substantially helped consumers by expanding their access to these services, making them more convenient, and broadening the scope of those who can take use of them (Durai, T., & Stella, 2019; Rasheed *et al.*, 2019; Shofawati, 2019). Financial innovation has enabled clients to access financial services that were earlier unavailable to them, for example online payment systems and mobile banking (Gomber *et al.*, 2018; Mhlanga, 2020; Palmié *et al.*, 2020). Financial innovation has also reduced the costs of financial services, making them more accessible to low-income clients (Damodaran, 2006; Yawe and Prabhu, 2015). Novel financial products and services have transformed the industry. New financial products and services carry risks.

Implications of Financial Innovation For Institutions and Clients

Changes brought about by financial innovation have produced both new opportunities and new perils for the financial services industry and its customers. New financial services and products, such as peer-to-peer lending, internet banking, and mobile payments, have been produced as a result of financial innovation, increasing client accessibility and convenience (Lee and Shin, 2018b; V. I. Soloviev, 2018; V. Soloviev, 2018; Vučinić, 2020). As new financial instruments and trading methods have evolved, financial innovation has increased the complexity and potential danger of the financial system (Merton, 1995; Rajan, 2005; Chiu, 2016). Financial institutions are faced with the challenge of managing these risks while maintaining profitability and meeting the needs of their clients. Moreover, financial innovation has also had an impact on investment decision-making processes. The problem for financial institutions is how to deal with these threats without impairing their income or customers' happiness (Cumming and Hirtle, 2001).

Findings and Conclusion

The study "Impact of Financial Innovation on Institutions and Clients: A Secondary Data Analysis" aimed to look into the impact of financial innovation, engineering, and analytics on financial institutions and their clients, with a particular emphasis on financial services & products, risk management, and investment decision-making. According to the results of the study, the financial sector has been considerably influenced by technological advancements in the financial sector. This can be accomplished through developing innovative financial goods and services, refining existing risk management strategies, and modifying the decision-making processes pertaining to investments. On the other hand, this has resulted in difficulties, such as an increase in complexity and the possibility of risk, for both the financial institutions and the customers of such organisations. Strategies such as diversification, hedging, stress testing, value-at-risk (VaR), and collateral management are discussed in the paper as means of mitigating the risks inherent in the introduction of new financial services & products. The outcomes of the study emphasise the advantages of financial innovation not just for financial institutions but additionally for the customers of those firms. It also indicates that in order for FI's i.e., (Financial Institutions) to continue operating successfully over the long term, they will need to adapt to these technological advances in order to continue to serve the specific requirements of their customers.

Limitations and Future Scope

Limitations: Since the study had included secondary data as per the requirements of the topic. Due to its reliance on secondary sources, this study might have overlooked some vital consequences of financial innovation and other aspects of it.

Future Scope: Financial innovation's influence could be better understood with a quantitative approach and a deeper analysis of cultural and regulatory differences. Future studies could also look into how financial innovation affects consumer behaviour, financial literacy, and the ethical implications of this innovation. This study has shed light on financial innovation, engineering, and analytics' difficulties and prospects, despite its limits. The results show how significantly financial innovation has affected the financial sector and how financial institutions must adapt to these developments in order to meet client expectations and continue to be viable. The study also provides a framework for quantitative research and a deeper understanding of cultural and regulatory variations that affect financial innovation adoption and effect.

Reference:

- Adarbah, H.Y. and Al-Badi, A.H. (2023).** 'Banking on the Cloud: Insights into Security and Smooth Operations', *Journal of Business, Communication & Technology*, pp. 1–14. Available at: <https://doi.org/10.56632/bct.2023.2201>.
- Agarwal, M. (2019).** *Analysing the Evolution of FinTech Research Topics in Academia*. National College of Ireland, Dublin.
- Ahmed, H. (2009).** 'Financial Crisis: Risks and Lessons for Islamic Finance', *ISRA International Journal of Islamic Finance*, 1(1), pp. 7–32. Available at: <https://doi.org/10.55188/ijif.v1i1.69>.
- Ahmed, L. (2015).** 'The effect of foreign exchange exposure on the financial performance of commercial banks in Kenya.', *International journal of scientific and research publications*, 5(11), pp. 115–120.
- Ahsan, M. et al. (2022).** 'Cybersecurity Threats and Their Mitigation Approaches Using Machine Learning—A Review', *Journal of Cybersecurity and Privacy*, 2(3), pp. 527–555. Available at: <https://doi.org/10.3390/jcp2030027>.
- Al-Jabri, brahim M. and Sohail, M.S. (2012).** 'Mobile banking adoption: Application of diffusion of innovation theory', *Journal of Electronic Commerce Research*, 13(4), pp. 379–391.
- Allen, F., Mcandrews, J. and Strahan, P. (2002).** 'E-Finance : An Introduction', *Journal of financial services research*, 5(27). Available at: <https://doi.org/https://doi.org/10.1023/A:1016007126394>.
- Allioui, H. and Mourdi, Y. (2023).** 'Exploring the Full Potentials of IoT for Better Financial Growth and Stability: A Comprehensive Survey', *Sensors*. Multidisciplinary Digital Publishing Institute (MDPI). Available at: <https://doi.org/10.3390/s23198015>.
- Anadu, K. et al. (2020).** 'The Shift from Active to Passive Investing: Potential Risks to Financial Stability?', *Finance and Economics Discussion Series*, 2020(060r1). Available at: <https://doi.org/10.17016/feds.2018.060r1>.
- Anagnostopoulos, I. (2018).** 'Fintech and regtech: Impact on regulators and banks', *Journal of Economics and Business*, 100(July), pp. 7–25. Available at: <https://doi.org/10.1016/j.jeconbus.2018.07.003>.
- Anshari, M., Almunawar, M.N. and Masri, M. (2022).** 'Digital Twin: Financial Technology's Next Frontier of Robo-Advisor', *Journal of Risk and Financial Management*, 15(4). Available at: <https://doi.org/10.3390/jrfm15040163>.
- Armstrong, E. (2005).** 'Integrity, Transparency and Accountability in Public Administration: Recent Trends, Regional and International Developments and Emerging Issues', *United Nations, Department of Economic and Social Affairs*, 1(10), pp. 1–10.
- Arner, D.W., Barberis, J.N. and Buckley, R.P. (2015).** 'The Evolution of Fintech: A New Post-Crisis Paradigm?', *Georgetown Journal of International Law*, 47(4), pp. 1271–1320. Available at: <https://doi.org/10.2139/ssrn.2676553>.
- Atalay, M., Anafarta, N. and Sarvan, F. (2013a).** 'The Relationship between Innovation and Firm Performance: An Empirical Evidence from Turkish Automotive Supplier Industry', *Procedia - Social and Behavioral Sciences*, 75, pp. 226–235. Available at: <https://doi.org/10.1016/j.sbspro.2013.04.026>.
- Atalay, M., Anafarta, N. and Sarvan, F. (2013b).** 'The Relationship between Innovation and Firm Performance: An Empirical Evidence from Turkish Automotive Supplier Industry', *Procedia - Social and Behavioral Sciences*, 75, pp. 226–235. Available at: <https://doi.org/10.1016/j.sbspro.2013.04.026>.
- Becker, Y.L. and Reinganum, M.R. (2018).** *THE CURRENT STATE OF QUANTITATIVE EQUITY INVESTING Literature Review*, CFA Institute Research Foundation.
- Beck, T. et al. (2016).** 'Financial innovation: The bright and the dark sides', *Journal of Banking and Finance*, 72, pp. 28–51. Available at: <https://doi.org/10.1016/j.jbankfin.2016.06.012>.
- Benninga, S. and Wiener, Z. (1998).** 'Value at Risk (VaR)', *Matrix*, 7(4), pp. 95–106. Available at: <https://doi.org/10.32870/myn.vi45.7665.g6732>.
- Berger, E.S.C., Wenzel, M. and Wohlgemuth, V. (2018).** 'Imitation-related performance outcomes in social trading: A configurational approach', *Journal of Business Research*, 89(December 2017), pp. 322–327. Available at: <https://doi.org/10.1016/j.jbusres.2017.12.016>.
- Bhupathi, T. (2010).** 'Technology's Latest Market Manipulator-High Frequency Trading: The Strategies, Tools, Risks, and Responses', *North Carolina Journal of Law & Technology*, 11(2), pp. 377–400.

- Boot, A. et al. (2020).** 'Financial Intermediation and Technology', *IMF Working Papers*, 20(161). Available at: <https://doi.org/10.5089/9781513552491.001>.
- Bova, F., Goldfarb, A. and Melko, R.G. (2021).** 'Commercial applications of quantum computing', *EPJ Quantum Technology*. Springer Science and Business Media Deutschland GmbH. Available at: <https://doi.org/10.1140/epjqt/s40507-021-00091-1>.
- Carbó-Valverde, S., Cuadros-Solas, P.J. and Rodríguez-Fernández, F. (2022).** *Entrepreneurial, institutional and financial strategies for FinTech profitability, Financial Innovation*. Springer Berlin Heidelberg. Available at: <https://doi.org/10.1186/s40854-021-00325-2>.
- Chang, S.E., Luo, H.L. and Chen, Y. (2020).** 'Blockchain-enabled trade finance innovation: A potential paradigm shift on using letter of credit', *Sustainability (Switzerland)*, 12(1). Available at: <https://doi.org/10.3390/su12010188>.
- Chitra, K. and Subashini, B. (2013).** 'Data Mining Techniques and its Applications in Banking Sector', *International Journal of Emerging Technology and ...*, 3(8), pp. 219–226.
- Chiu, I.H. (2016).** 'Fintech and disruptive business models in financial products, intermediation and markets-policy implications for financial regulators', *Journal of Technology Law & Policy*, 21, pp. 55–112.
- Claessens, S., Glaessner, T. and Klingebiel, D. (2002).** 'Electronic finance: Reshaping the financial landscape around the world', *Journal of Financial Services Research*, 22(1–2), pp. 29–61. Available at: <https://doi.org/10.1023/A:1016023528211>.
- Crosby, M. et al. (2016).** 'Blockchain technology: Beyond Bitcoin', *Applied Innovation Review*, 27(2), pp. 6–10. Available at: <https://doi.org/10.15358/0935-0381-2015-4-5-222>.
- Cumming, C.M. and Hirtle, B.J. (2001).** 'The Challenges of Risk Management in Diversified Financial Companies', *Economic Policy Review*, 7(1), pp. 82–84. Available at: <https://doi.org/10.2469/dig.v31.n4.984>.
- Cumming, D., Johan, S. and Reardon, R. (2023).** 'Global fintech trends and their impact on international business: a review', *Multinational Business Review*. Emerald Publishing, pp. 413–436. Available at: <https://doi.org/10.1108/MBR-05-2023-0077>.
- Dabrowski, M.R. (2017).** *Potential impact of financial innovation on financial services and monetary policy*.
- Dalko, V., & Wang, M.H. (2020).** 'High-frequency trading is an order-based innovation and manipulation', *Journal of Banking Regulation*, 45(2), pp. 289–298.
- Damodaran, A. (2006).** 'Financial Inclusion: Issues and Challenges on JSTOR', *Economic and Political Weekly*, 41(41), pp. 4310–4313.
- Dermine, J. (2016).** 'Digital banking and market disruption: a sense of déjà vu?', *Financial Stability Review*, 20(April), pp. 17–23.
- Dicuonzo, G. et al. (2019).** 'Risk Management 4.0: the Role of Big Data Analytics in the Bank Sector', *International Journal of Economics and Financial Issues*, 9(6), pp. 40–47. Available at: <https://doi.org/10.32479/ijefi.8556>.
- Domanski, D. and Neumann, U. (2001).** 'Collateral in wholesale financial markets', *BIS Quarterly Review*, (September), pp. 57–64.
- Durai, T., & Stella, G. (2019).** 'Digital finance and its impact on financial inclusion', *Journal of Emerging Technologies and Innovative Research*, 6(1), pp. 122–127.
- Dyba, M. and Gernego, I. (2019).** *The Role of Robo-Advisors for Global Financial Market Growth*. Intellectual Economics, Management and Education,.
- Egger, D.J. et al. (2020).** 'Quantum Computing for Finance: State-of-the-Art and Future Prospects', *IEEE Transactions on Quantum Engineering*, 1. Available at: <https://doi.org/10.1109/TQE.2020.3030314>.
- Ernst & Young (2019a).** *Global FinTech Adoption Index 2019*, Ernst & Young.
- Ernst & Young (2019b).** *Global FinTech Adoption Index 2019*, Ernst & Young.
- Errico, L., & Sundararajan, V. (2002).** *Islamic Financial Institutions and Products in the Global Financial System: Key Issues in Risk Management and Challenges Ahead*. 02.
- Etemadi, N. et al. (2021).** 'Supply chain disruption risk management with blockchain: A dynamic literature review', *Information (Switzerland)*, 12(2), pp. 1–25. Available at: <https://doi.org/10.3390/info12020070>.

- Everhart, J.R. (2020).** 'The Fintech Sandbox: An Overview of Regulatory Sandbox Regimes', *Southern Journal of Business and Ethics*, 12, p. 64.
- Frame, S. and White, L.J. (2012).** 'Technological Change, Financial Innovation, and Diffusion in Banking', *The Oxford Handbook of Banking*, pp. 1–37. Available at: <https://doi.org/10.1093/oxfordhb/9780199640935.013.0019>.
- Franklin, A. and Anthony, S.M. (1997).** 'On the theory of financial intermediation', *Journal of Banking & Finance*, 21, 11(12), pp. 1461–1485. Available at: <https://doi.org/10.1007/BF01388162>.
- Fredrik Kristoffersson (2017)** *Kandidatuppsats*. Mid Sweden University.
- Glaser, F. and Risius, M. (2018).** 'Effects of transparency: Analyzing social biases on trader performance in social trading', *Journal of Information Technology*, 33(1), pp. 19–30. Available at: <https://doi.org/10.1057/s41265-016-0028-0>.
- Goldstein, M.A., Kumar, P. and Graves, F.C. (2014).** 'Computerized and high-frequency trading', *Financial Review*, 49(2), pp. 177–202. Available at: <https://doi.org/10.1111/fire.12031>.
- Gomber, P. et al. (2018).** 'On the Fintech Revolution: Interpreting the Forces of Innovation, Disruption, and Transformation in Financial Services', *Journal of Management Information Systems*, 35(1), pp. 220–265. Available at: <https://doi.org/10.1080/07421222.2018.1440766>.
- Griffin, P.R., Sampat, R. and Griffin, P. (2021).** *Quantum computing for supply chain finance*. Available at: https://ink.library.smu.edu.sg/sis_research.
- Guo, Y. and Liang, C. (2016).** 'Blockchain application and outlook in the banking industry', *Financial Innovation*, 2(1). Available at: <https://doi.org/10.1186/s40854-016-0034-9>.
- Gutlapalli, S.S. (2016).** 'Commercial Applications of Blockchain and Distributed Ledger Technology', *Engineering International*, 4(2).
- Hamledari, H. and Fischer, M. (2021).** 'The application of blockchain-based crypto assets for integrating the physical and financial supply chains in the construction & engineering industry', *Automation in Construction*, 127(December 2020), p. 103711. Available at: <https://doi.org/10.1016/j.autcon.2021.103711>.
- Hendershott, T. et al. (2021).** 'Fintech as a game changer: Overview of research frontiers', *Information Systems Research*, 32(1), pp. 1–17. Available at: <https://doi.org/10.1287/isre.2021.0997>.
- Herman, D. et al. (2022).** 'A Survey of Quantum Computing for Finance', *arXiv preprint arXiv:2201.02773*, pp. 1–64. Available at: <http://arxiv.org/abs/2201.02773>.
- Hitt, M. (1994).** 'A mid-range theory of the interactive effects of international and product diversification on innovation and performance', *Journal of Management*, 20(2), pp. 297–326. Available at: [https://doi.org/10.1016/0149-2063\(94\)90018-3](https://doi.org/10.1016/0149-2063(94)90018-3).
- Huang, X., Zhou, H. and Zhu, H. (2009).** 'A Framework for Assessing the Systemic Risk of Major Financial Institutions', *Journal of Banking & Finance*, 33(11), pp. 2036–2049.
- Jabbar, B. (2023).** 'Financial Technology (FinTech) and the Future of Banking', *Journal for Business Research Review*, 1(2), pp. 70–79.
- Jackson, J. (2010).** 'Promoting energy efficiency investments with risk management decision tools', *Energy Policy*, 38(8), pp. 3865–3873. Available at: <https://doi.org/10.1016/j.enpol.2010.03.006>.
- Jorion, P. (1996).** 'Risk2: Measuring the risk in value at risk', *Financial Analysts Journal*, 52(6), pp. 47–56. Available at: <https://doi.org/10.2469/faj.v52.n6.2039>.
- Joyce, M.A.S. et al. (2011).** 'The financial market impact of quantitative easing in the United Kingdom', *International Journal of Central Banking*, 7(3), pp. 113–161.
- Kayode, S.O. (2023).** 'Revolutionizing Financial Landscapes: The Role of Emerging Technologies in Fintech Transformation'. Available at: <https://www.researchgate.net/publication/378498600>.
- Koonce, L., Lipe, M.G. and McAnally, M.L. (2005).** 'Judging the risk of financial instruments: Problems and potential remedies', *Accounting Review*, 80(3), pp. 871–895. Available at: <https://doi.org/10.2308/accr.2005.80.3.871>.
- Kosev, M. and Williams, T. (2011).** 'Exchange-traded funds', *RBA Bulletin*, pp. 52–59.

- Kowalewski, O. and Pisany, P. (2020).** *The Rise of Fintech: A Cross-Country Perspective*. 07. Paris. Available at: www.ieseg.fr.
- Kshetri, N. (2021).** 'The Role of Artificial Intelligence in Promoting Financial Inclusion in Developing Countries', *Journal of Global Information Technology Management*, 24(1), pp. 1–6. Available at: <https://doi.org/10.1080/1097198X.2021.1871273>.
- Laeven, L., Levine, R. and Michalopoulos, S. (2015).** 'Financial innovation and endogenous growth', *Journal of Financial Intermediation*, 24(1), pp. 1–24. Available at: <https://doi.org/10.1016/j.jfi.2014.04.001>.
- Lange, A.C., Lenglet, M. and Seyfert, R. (2016).** 'Cultures of high-frequency trading: mapping the landscape of algorithmic developments in contemporary financial markets', *Economy and Society*, 45(2), pp. 149–165. Available at: <https://doi.org/10.1080/03085147.2016.1213986>.
- Lee, C.H. et al. (2021).** 'Enabling blockchain based scm systems with a real time event monitoring function for preemptive risk management', *Applied Sciences (Switzerland)*, 11(11). Available at: <https://doi.org/10.3390/app11114811>.
- Lee, I. and Shin, Y.J. (2018a).** 'Fintech: Ecosystem, business models, investment decisions, and challenges', *Business Horizons*, 61(1), pp. 35–46. Available at: <https://doi.org/10.1016/j.bushor.2017.09.003>.
- Lee, I. and Shin, Y.J. (2018b).** 'Fintech: Ecosystem, business models, investment decisions, and challenges', *Business Horizons*, 61(1), pp. 35–46. Available at: <https://doi.org/10.1016/j.bushor.2017.09.003>.
- Lee, R., Lee, J.H. and Garrett, T.C. (2019).** 'Synergy effects of innovation on firm performance', *Journal of Business Research*, 99(November 2016), pp. 507–515. Available at: <https://doi.org/10.1016/j.jbusres.2017.08.032>.
- Leo, M., Sharma, S. and Maddulety, K. (2019).** 'Machine learning in banking risk management: A literature review', *Risks*, 7(1), p. 29. Available at: <https://doi.org/10.3390/risks7010029>.
- Leong, K. (2018).** 'FinTech (Financial Technology): What is It and How to Use Technologies to Create Business Value in Fintech Way?', *International Journal of Innovation, Management and Technology*, 9(2), pp. 74–78. Available at: <https://doi.org/10.18178/ijimt.2018.9.2.791>.
- Lerner, J. and Nanda, R. (2020).** 'Venture capital's role in financing innovation: What we know and how much we still need to learn', *Journal of Economic Perspectives*, 34(3), pp. 237–261. Available at: <https://doi.org/10.1257/jep.34.3.237>.
- Li, J. and Kassem, M. (2021).** 'Applications of distributed ledger technology (DLT) and Blockchain-enabled smart contracts in construction', *Automation in Construction*. Elsevier B.V. Available at: <https://doi.org/10.1016/j.autcon.2021.103955>.
- Li, J.P. et al. (2021).** 'Bitcoin: The biggest financial innovation of fourth industrial revolution and a portfolio's efficiency booster', *Technological Forecasting and Social Change*, 162(October 2020), p. 120383. Available at: <https://doi.org/10.1016/j.techfore.2020.120383>.
- Li, Y. (2024).** *Essays in Financial Technology: Banking Efficiency and Application of Machine Learning Models in Supply Chain Finance and Credit Risk Assessment*. Doctoral dissertation. Adam Smith Business . Available at: <https://theses.gla.ac.uk/84159/3/2023LiYixuanPhD.pdf> (Accessed: 19 April 2024).
- Loo, R. Van (2018).** 'Making innovation more competitive: The case of fintech', *UCLA Law Review*, 65(1), pp. 232–279.
- Malali, A.B. and Gopalakrishnan, S. (2020).** 'Application of Artificial Intelligence and Its Powered Technologies in the Indian Banking and Financial Industry: An Overview', *IOSR Journal Of Humanities And Social Science (IOSR-JHSS)*, 25(6), pp. 55–60. Available at: <https://doi.org/10.9790/0837-2504065560>.
- Martinez Peria, M.S. et al. (2001).** *Stress Testing of Financial Systems: An Overview of Issues, Methodologies, and FSAP Experiences*, *IMF Working Papers*. Available at: <https://doi.org/10.5089/9781451851168.001>.
- Mazambani, L. and Mutambara, E. (2020).** 'Predicting FinTech innovation adoption in South Africa: the case of cryptocurrency', *African Journal of Economic and Management Studies*, 11(1), pp. 30–50. Available at: <https://doi.org/10.1108/AJEMS-04-2019-0152>.
- Mention, A.L. (2019).** 'The Future of Fintech', *Research Technology Management*, 62(4), pp. 59–63. Available at: <https://doi.org/10.1080/08956308.2019.1613123>.

Merton, R.C. (1995). 'Financial innovation and the management and regulation of financial institutions', *Journal of Banking & Finance*, 19(3–4), pp. 461–481.

Mhlanga, D. (2020). 'Industry 4.0 in finance: the impact of artificial intelligence (ai) on digital financial inclusion', *International Journal of Financial Studies*, 8(3), pp. 1–14. Available at: <https://doi.org/10.3390/ijfs8030045>.

Mills, D. et al. (2016). 'Distributed Ledger Technology in Payments, Clearing, and Settlement', *Finance and Economics Discussion Series*, 2016(095). Available at: <https://doi.org/10.17016/feds.2016.095>.

Muganyi, T. et al. (2022). 'Fintech, regtech, and financial development: evidence from China', *Financial Innovation*, 8(1). Available at: <https://doi.org/10.1186/s40854-021-00313-6>.

Naik, A. et al. (2023). 'From Portfolio Optimization to Quantum Blockchain and Security: A Systematic Review of Quantum Computing in Finance', *arXiv preprint arXiv:2307.01155*, pp. 1–57. Available at: <http://arxiv.org/abs/2307.01155>.

Natarajan, Harish., Krause, S., and Gradstein, H. (2017). *Distributed ledger technology and blockchain*. Washington, DC. Available at: <https://openknowledge.worldbank.org/server/api/core/bitstreams/5166f335-35db-57d7-9c7e-110f7d018f79/content> (Accessed: 24 February 2024).

Ojiaku, O.C. et al. (2024). 'Integrating TTF and UTAUT models to illuminate factors that influence consumers' intentions to adopt financial technologies in an emerging country context', *International Journal of Technology Marketing*, 18(1), pp. 113–135. Available at: <https://www.inderscience.com/ijtmktdistributedundertheCCBYlicense>.

Ozili, P.K. (2018). 'Impact of digital finance on financial inclusion and stability', *Borsa Istanbul Review*, 18(4), pp. 329–340. Available at: <https://doi.org/10.1016/j.bir.2017.12.003>.

Palmié, M. et al. (2020). 'The evolution of the financial technology ecosystem: An introduction and agenda for future research on disruptive innovations in ecosystems', *Technological Forecasting and Social Change*, 151(June 2019), p. 119779. Available at: <https://doi.org/10.1016/j.techfore.2019.119779>.

Pandey, M.K. and Sergeeva, I. (2022). 'Artificial Intelligence Impact Evaluation: Transforming Paradigms in Financial Institutions', *World of Economics and Management*, 22(1), pp. 147–164. Available at: <https://doi.org/10.25205/2542-0429-2022-22-1-147-164>.

Rajan, R.G. (2005). 'Has Finance Made the World Riskier?', *European financial management*, 12(4), pp. 499–533. Available at: <https://doi.org/https://doi.org/10.1111/j.1468-036X.2006.00330.x>.

Rasheed, R. et al. (2019). 'Financial Inclusion for SMEs: Role of Digital Micro-financial Services', *Review of Economics and Development Studies*, 5(3), pp. 429–439. Available at: <https://doi.org/10.26710/reads.v5i3.686>.

Rossi, M. (2014). 'The New Ways to Raise Capital: An Exploratory Study of Crowdfunding', *International Journal of Financial Research*, 5(2), pp. 8–18. Available at: <https://doi.org/10.5430/ijfr.v5n2p8>.

Schoemaker, P.J.H. (1991). 'When and how to use scenario planning: A heuristic approach with illustration', *Journal of Forecasting*, 10(6), pp. 549–564. Available at: <https://doi.org/10.1002/for.3980100602>.

Seddon, J.J.J.M. and Currie, W.L. (2017). 'A model for unpacking big data analytics in high-frequency trading', *Journal of Business Research*, 70, pp. 300–307. Available at: <https://doi.org/10.1016/j.jbusres.2016.08.003>.

Sedik, T.S. et al. (2019). *The digital revolution in Asia and its macroeconomic effects*. 1029. Available at: <https://www.adb.org/publications/digital-revolution-asia-macroeconomic-effects>.

Shabsigh, G. and Boukherouaa, E.B. (2023). 'Generative Artificial Intelligence in Finance: Risk Considerations', in *FinTech Notes*.

Shah, D., Isah, H. and Zulkernine, F. (2019). 'Stock market analysis: A review and taxonomy of prediction techniques', *International Journal of Financial Studies*, 7(2). Available at: <https://doi.org/10.3390/ijfs7020026>.

Shaik, K. (2014). 'Collateral Management', *Managing Derivatives Contracts*, pp. 251–274. Available at: https://doi.org/10.1007/978-1-4302-6275-6_11.

Sharbek, N. (2022). 'How Traditional Financial Institutions have adapted to Artificial Intelligence, Machine Learning and FinTech?', *Proceedings of the International Conference on Business Excellence*, 16(1), pp. 837–848. Available at: <https://doi.org/10.2478/picbe-2022-0078>.

- Shofawati, A. (2019).** 'The Role of Digital Finance to Strengthen Financial Inclusion and the Growth of SME in Indonesia', *KnE Social Sciences*, 3(13), pp. 389–407. Available at: <https://doi.org/10.18502/kss.v3i13.4218>.
- Shrestha, R., Gurung, D. and Thapa, S. (2024).** 'Enhancing Risk Management, Fraud Detection and Personalized Services in Financial Services with Big Data in the United Kingdom', *Journal of Empirical Social Science Studies*, 8(2), pp. 23–37.
- Silvasti, V., Grobys, K. and Äijö, J. (2021).** 'Is smart beta investing profitable? evidence from the Nordic stock market', *Applied Economics*, 53(16), pp. 1826–1839. Available at: <https://doi.org/10.1080/00036846.2020.1853669>.
- Siracusano, L. (2014).** 'Considering Smart Beta', *Journal of Indexes*, 17(4), pp. 44–57.
- Soloviev, V. (2018).** 'Fintech Ecosystem in Russia', *Proceedings of 2018 11th International Conference "Management of Large-Scale System Development"*, *MLSD 2018* [Preprint]. Available at: <https://doi.org/10.1109/MLSD.2018.8551808>.
- Soloviev, V.I. (2018).** 'Fintech ecosystem and landscape in Russia', *Journal of Reviews on Global Economics*, 7(Special Issue), pp. 377–390. Available at: <https://doi.org/10.6000/1929-7092.2018.07.32>.
- Thennakoon, A. et al. (2019).** 'Real-time credit card fraud detection using machine learning', *Proceedings of the 9th International Conference On Cloud Computing, Data Science and Engineering, Confluence 2019*, (July), pp. 488–493. Available at: <https://doi.org/10.1109/CONFLUENCE.2019.8776942>.
- Turan, S.S. (2015).** 'Financial Innovation - Crowdfunding: Friend or Foe?', *Procedia - Social and Behavioral Sciences*, 195, pp. 353–362. Available at: <https://doi.org/10.1016/j.sbspro.2015.06.334>.
- Turner, G. and Sushko, V. (2018).** 'The implications of passive investing for securities markets', *BIS Quarterly Review*, 1(March), pp. 113–131.
- Uchenna Innocent Nnaomah et al. (2024).** 'Conceptualizing Fintech's Impact On Banking: A Comparative Study Of The Usa And Nigeria', *Finance & Accounting Research Journal*, 6(3), pp. 437–462. Available at: <https://doi.org/10.51594/farj.v6i3.970>.
- Vučinić, M. (2020).** 'Fintech and Financial Stability Potential Influence of FinTech on Financial Stability, Risks and Benefits', *Journal of Central Banking Theory and Practice*, 9(2), pp. 43–66. Available at: <https://doi.org/10.2478/jcbtp-2020-0013>.
- Wardle, M. and Mainelli, M. (2023).** *The Global Financial Centres Index 34*. Available at: https://www.longfinance.net/media/documents/GFCI_34_Report_2022.09.28_v1.0.pdf (Accessed: 27 February 2024).
- Xi, D., O'Brien, T.I. and Irannezhad, E. (2020).** 'Investigating the investment behaviors in cryptocurrency', *Journal of Alternative Investments*, 23(2), pp. 141–160. Available at: <https://doi.org/10.3905/JAI.2020.1.108>.
- Yawe, B.L. and Prabhu, J. (2015).** 'Academic papers Innovation and financial inclusion: A review of the literature', *Journal of Payments Strategy & Systems Journal of Payments Strategy & Systems*, 9(3), pp. 215–228.
- Yuliya Komarova Loureiro and Laura Gonzalez (2015).** 'Competition against common sense: Insights on peer-to-peer lending as a tool to allay financial exclusion', *International Journal of Bank Marketing*, 33(5), pp. 605–623. Available at: <https://doi.org/10.1108/IJBM-06-2014-0065>.
- Zalan, T. and Toufaily, E. (2017).** 'The promise of fintech in emerging markets: Not as disruptive', *Contemporary Economics*, 11(4), pp. 415–430. Available at: <https://doi.org/10.5709/ce.1897-9254.253>.
- Zavolokina, L., Dolata, M. and Schwabe, G. (2016a).** 'The FinTech phenomenon: antecedents of financial innovation perceived by the popular press', *Financial Innovation*, 2(1). Available at: <https://doi.org/10.1186/s40854-016-0036-7>.
- Zavolokina, L., Dolata, M. and Schwabe, G. (2016b).** 'The FinTech phenomenon: antecedents of financial innovation perceived by the popular press', *Financial Innovation*, 2(1). Available at: <https://doi.org/10.1186/s40854-016-0036-7>.

Examining the Role of Big Five Personality Traits on Entrepreneurial Intention of Rural Youth in Haryana

Ms. Kiran

Research Scholar, Department of Management, Akal College of Economics, Commerce and Management Eternal University, Baru Sahib, Himachal Pradesh, India

Dr. Ankit Pathania

Assistant Professor, Department of Management, Akal College of Economics, Commerce and Management Eternal University, Baru Sahib, Himachal Pradesh, India

Dr. Vikash

Assistant Professor, Department of Food Business Management & Entrepreneurship Development, National Institute of Food Technology Entrepreneurship and Management, Kundli, Sonapat, Haryana, India

Abstract

Youth entrepreneurship is crucial for economic development of any nation. Increasing people's enthusiasm in starting new businesses is a valuable asset, particularly for developing nations where entrepreneurship is essential to boosting economic progress. The recent financial crisis made policymakers focus on entrepreneurship as a catalyst for growth, competitiveness and the creation of new job possibilities on a regional and national level. This study explored the relationship between entrepreneurial intention and personality traits among rural youth in Haryana. In order to examine the relationship between personality traits and entrepreneurial intention within the setting of Haryana, this study employed a quantitative research methodology based on survey responses from a sample of 396 respondents from thirty-six villages of three districts in Haryana. The data were collected during the last quarter of 2023 from the rural youth between the age of 15-30. Statistical analyses, including frequency analysis, Pearson correlation and factor analysis, revealed significant findings. From factor analysis, five factors were extracted and named as per the components of big 5 personality traits i.e. openness to experience, conscientiousness, extraversion, agreeableness and neuroticism and through correlation, their relation was checked with the entrepreneurial intention. It was found that entrepreneurial intention was positively correlated with extraversion and openness, indicating that more outgoing and open-minded individuals were inclined towards entrepreneurship. Conversely, neuroticism showed a negative correlation, suggesting that less neurotic individuals were more entrepreneurial. Conscientiousness and agreeableness were also positively correlated with entrepreneurial intention, implying that organized, diligent, cooperative and considerate individuals had higher entrepreneurial aspirations. This study underscored the importance of personality traits in fostering entrepreneurial intentions among rural youth. Further, it was seen that it was seen that gender, age, family type, marital status and occupational status were also playing an important role in forming entrepreneurial intention of rural youth.

Keywords: Correlation, Demographics, Employment, Entrepreneurship, Rural Youth

Introduction

The notion of entrepreneurship has garnered significant interest across the globe, particularly in emerging nations that face numerous challenges impeding economic expansion. Addressing economic issues like unemployment, generating new money, creating jobs, stabilising society, boosting industrial competitiveness and promoting economic development, all depend on entrepreneurship (Chandrasekaran and Narayanan, 2019). In order to address the above said issues and their detrimental effects, governments and decision-makers have therefore given a lot of attention to entrepreneurship. This is because they want to know how to encourage and lead the next generation of workers, such as youth, towards entrepreneurial activities (Merrill et al., 2008; Kim, 2018). In order to do this, a significant number of academics have begun to recognise and explore the factors that may suggest an entrepreneurial orientation. The distinct thought, emotion and behaviour patterns that set each individual apart from others are referred to as their personality and personality traits are one of the most prominent study streams concerning the prediction of entrepreneurial intention. Impact of general personality traits (the big five personality traits) or specific personality traits (such as the drive for achievement) on a person's intention to launch a new company is in order to gain a deeper understanding of the relationship between personality and entrepreneurship (Zhao et al., 2010; Kerr et al., 2018). According to certain research, personality qualities have a stronger predictive power for starting own business (Wang et al., 2016). A prevalent notion held that personality and entrepreneurship did not always correlate and the outcomes were mixed (Zhao et al., 2010). But researches on the association between the Big Five personality traits and entrepreneurship have

been done primarily in industrialised or developed nations; developing nations like India have not received as much attention as they should (Alkhatib et al., 2020). As per the Global Entrepreneurship Monitor (2020), India is on fifth position in case of entrepreneurship environment as well as in one of the top nations for invention and creativity. Maintaining and raising the level of this indicator is necessary since it is a good indicator that highlights the significance of entrepreneurship in India. As per a report by the Centre for Monitoring Indian Economy (2022), Haryana has the highest unemployment rate of 37.30 per cent, which is about four times higher than the national average of 8.3%. According to estimates from the Ministry of Social Justice and Empowerment (2022), 13.6% of people in rural Haryana live in poverty. They no longer have the means to live the modern lifestyle they desire or anticipate, thus they have higher expectations now. Further, by understanding their intention for entrepreneurship will enhance the social and economic environment as young entrepreneurs have tremendous business opportunities in the rural sector because of its enormous untapped potential. However, there is an urgent need to know that which personality traits are affecting view point of rural youth towards entrepreneurship because personality of an individual affects his decision-making.

In light of this, the objective of the study is to examine the relation between entrepreneurial intention and the Big Five personality traits of rural youth in India.

Literature Review

Intention is a mental or intellectual condition that inspires people to concentrate on a specific objective (Chhabra et al., 2020). Therefore, it is essential to comprehend the part, intention plays in the entrepreneurial process. Verheul et al. (2012) stated that figuring out the underlying motivations for the entrepreneurship process required a grasp of the concept of entrepreneurial intention. Various studies (Saeed et al., 2013; Miralles et al., 2016) have also shown that intention played a crucial role in the establishment of a successful commercial enterprise. A constant personal response brought on by outside circumstances was referred as a personality feature. According to personality theorists, one can use a person's personality to anticipate their behaviour. Based on the results of multiple meta-analyses, the general consensus was that a person's personality traits driven their behaviour and decision-making, which in turn affected their success as an entrepreneur. Strong attributes associated with excellent performance indicate that entrepreneurs were more likely to manage their companies over the long haul (Ciavarella et al., 2004). Individuals those possessed specific personality traits, tended to find entrepreneurship rewarding and enjoyable, which helped them to appreciate participating in such activities. On the other hand, those who lacked key characteristics associated with successful entrepreneurship might not feel motivated to pursue entrepreneurship after suffering a major setback in their initial ventures. Owing to the stability of the scale used to evaluate the Big Five personality traits, some researchers (Goldberg, 1993) have suggested that the qualities can be used to describe nearly every aspect of an individual's personality. Additionally, one can evaluate a person's readiness for entrepreneurship using the Big Five personality traits (Zhao et al., 2010).

According to some academics (Zhao et al., 2010), business owners need to possess essential leadership abilities such as creating professional and social networks, expressing their vision and fervour, and concluding agreements. People with greater extraversion scores were usually sociable, extroverted, lively, and dynamic people who could hold people's attention in social settings. For many people, the idea of becoming an entrepreneur is more intriguing and alluring than managing a firm through traditional ways.

The contribution of agreeableness to entrepreneurial success had been the subject of much debate among academics. People with high agreeableness, according to Singh and DeNoble (2003), worked in social work since it helped others. Conversely, other academics felt that an entrepreneur must possess a high degree of agreeableness in order to launch a business. Ciavarella et al. (2004) clarified that business owners might boost their profits by cultivating a number of devoted consumers through building rapport and treating them with courtesy. Thus, there's a greater chance that amicable business owners will expand their startups into large conglomerates.

Conscientiousness was a feature that characterises a person's level of performance, planning, organisation, job motivation, obligation towards others and perseverance (Zhao et al., 2010 and Ciavarella et al., 2004). According to Barrick et al. (2001), conscientiousness was found to be the most dependable personality indicator of employee success in a variety of occupational settings. Being an entrepreneur involved perseverance, diligence and goal-setting. Conscientious person were found success driven, focused and success-oriented (Barrick et al., 2001). They also had fundamental qualities that were necessary for entrepreneurial success. Through a cognitive process, entrepreneurs developed a sensation of attentiveness. Individuals' learning capacities and experience levels were characterised by their cognitive development. People acquire knowledge-based traits through the cognitive process, which characterise an individual's quirks or peculiarities. They can therefore detect changes in a specific environment.

Neuroticism encapsulated the ways in which individuals managed their stress and highlighted the variations that how different people responded to a given circumstance. Mood swings, low self-esteem, despair, impulsivity and self-consciousness were common traits of people with high neuroticism, according to Costa and McCrae (1992). According to Barrick et al. (2001), feeling melancholy, nervous, furious, emotionally insecure, worried and ashamed were some of the frequent qualities of people with high neuroticism. According to Fiske et al. (2010), people with high levels of neuroticism perceived every day's events as dangerous and even slight irritations as impossibly challenging. Further, it was found that the people with high neuroticism were stressed, anxious and mentally unstable with a detrimental impact on an individual's entrepreneurial behaviour. In popular culture, entrepreneurs were portrayed as upbeat people who remained composed in the face of stress, uncertainty or social pressure. When others might be deterred by self-doubt, entrepreneurs were always willing to take on the mental and physical load and move (Zhao et al., 2010).

Openness is a quality that embodies a person's creativity, imagination and intellectual curiosity. It is also frequently linked to opportunity recognition (Ciavarella et al., 2004). A person's obsession with novelty and their diversity of interests can be described as openness. Since inventive problem-solving techniques were employed by creative entrepreneurs, creativity played a significant role in entrepreneurship. For example, Ciavarella et al. (2004) clarified that dynamic external factor impacting the firms necessitated that entrepreneurs sought out fresh information and applied creative thinking in order to devise practical approaches for managing these factors. Being creative was a crucial quality for businesses as it enabled them to come up with novel solutions to press issues. Quan (2012) asserted that prior knowledge greatly influenced the deliberate intention to start a venture.

Research Methodology

This study checked relation between entrepreneurial intention and personality traits, with data collected from rural youth of Haryana. Multi-stage sampling method was employed for the collection of data. At first stage, a complete list of districts along with their rural population (Population census, 2011) was prepared and three districts (Mahendragarh, Mewat and Fatehabad) having the highest proportion of rural population were chosen. At second stage, from each of selected district, three blocks with the highest proportion of rural population were selected. At third stage, four villages with the highest population were chosen from each of selected block. At final stage, 11 respondents were randomly selected from each of the selected block, totalling a sample size of 396 respondents. The data were collected in the last quarter of 2023. The sampled people in this study were asked to respond to a questionnaire. The Likert scale was used to measure the variables described i.e. 1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree) and 5 (strongly agree). To evaluate the nature and characteristics of the Big Five personality traits and how they affect rural youth's intentions, descriptive statistics, factor analysis, correlation and quantitative research approach was employed.

Factor Analysis

Factor Analysis is a technique that helps in understanding the structure of interrelationships among many variables. It aims to describe the covariance relationships among the observed variables in terms of a smaller number of unobserved variables, called factors (Olkin and Sampson, 2001).

In factor analysis, the observed variable X_i is modelled as a linear combination of the factors (Kothari, 2004):

$$X_i = \lambda_{i1}F_1 + \lambda_{i2}F_2 + \dots + \lambda_{im}F_m + \epsilon_i$$

Where,

- X_i : The i th observed variable.
- $F_1, F_2, \dots, F_m$: Common factors.
- λ_{ij} : Factor loadings (the coefficients that indicate the relationship between observed variables and factors).
- ϵ_i : The unique factor or error term associated with X_i

The goal is to estimate the factor loadings (λ_{ij}) and understand how much of the variance in each observed variable can be attributed to the underlying factors.

Dependent variable was entrepreneurial intention and a pre-tested schedule with 20 statements was adopted for measuring the entrepreneurial intention of rural youth. Personality traits of respondents were measured through 15 pre-tested statements. Through factor analysis, five factors were extracted and named as per the components of big 5 personality traits as openness to experience, conscientiousness, extraversion, agreeableness and neuroticism. Then, their relation was checked with the entrepreneurial intention through correlation matrix.

Cronbach's alpha, which gauges the scale's internal consistency, was used to assess tool's reliability (Nunnally, 1978). Here, the reliability is calculated for the measuring the instrument which included 15 items for assessing the personality traits (3 items each for Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism). The reliability of measurement tests presented by Table 1, where the Cronbach Alpha coefficient was greater than 0.7, reflected reliability of measurement tests (Nunnally, 1978 and Hair et al., 2018).

Table1: Reliability Statistics

Factors	Cronbach's Alpha Value	No. of items
Openness	0.870	3
Conscientiousness	0.870	3
Extraversion	0.836	3
Agreeableness	0.845	3
Neuroticism	0.847	3

(Source: Author's calculation through SPSS)

Table 2 summarised the demographic data of the respondents. As the respondents were selected randomly, 66.67 per cent were male respondents followed by female (33.33%). As evidenced by the observation that the sample was classified into three age intervals with the highest proportion (49.24%) of respondents from 25-30 age group. In terms of type of family amongst two categories, majority (73.23%) belonged to nuclear family followed by joint family (26.77%). The distribution of the sample in terms of occupational status showed that more than half of the respondents (53.79%) were employed in government sector, private or self-employed followed by unemployed respondents (46.21%).

Table 2: Demographic Profile of Respondents

	Particulars	Frequency	Percentage
Gender	Male	264	66.67
	Female	132	33.33
Age-Interval	15-20	54	13.64
	20-25	147	37.12
	25-30	195	49.24
Type of Family	Nuclear	290	73.23
	Joint	106	26.77
Marital Status	Married	185	46.72
	Unmarried	211	53.28
Occupational Status	Employed	213	53.79
	Unemployed	183	46.21

(Source: Primary data)

Results and Discussion

This section began with the descriptive statistics for the variable constructions that were taken into consideration for the research. Table 3 showed the number of items used for each of the construct, minimum, maximum, means and standard deviations for entrepreneurial intention, openness, conscientiousness, extraversion, agreeableness and neuroticism. The results showed that the means of openness and entrepreneurial intention varied from 3.20 to 3.52. According to the mean of the entrepreneurial intention, most of the respondents were either neutral or agreed to open their own firm in the future. Based on the narrow standard deviation (0.22), entrepreneurial intention appeared to be generally constant throughout the population.

Table 3: Descriptive Statistics

Variable	No. of observations	No. of items	Minimum	Maximum	Mean	S.D.
Entrepreneurial Intention	396	20	2.33	3.80	3.20	0.22
Openness	396	3	2.00	5.00	3.52	0.51
Conscientiousness	396	3	2.00	5.00	3.46	0.49
Extraversion	396	3	1.00	5.00	3.43	0.68
Agreeableness	396	3	1.00	4.00	3.22	0.46
Neuroticism	396	3	1.00	4.33	3.02	0.69

Table 4 showed that mean score for the entrepreneurial intention was higher in female (Mean= 3.21) as comparison with male (Mean= 3.19). Further, age group of 20-25 was more interested in entrepreneurship (Mean=3.22) followed by the respondents from nuclear family. Unmarried (Mean=3.20) and employed (Mean=3.21) respondents were more interested in entrepreneurship as comparison with married and

unemployed respondents. Male and female respondents scored equal (Mean=3.52) for the openness. The mean for conscientiousness (3.47) and extraversion (3.44) was high for male and female respondents scored high for agreeableness (3.29) and neuroticism (3.05). The mean score for conscientiousness was higher in the age group of 15-20 years; extraversion and agreeableness scored high in the age group of 20-25 years; openness and neuroticism scored high in the age group of 25-30 years. In the category of family type, respondents from nuclear family scored high for agreeableness, neuroticism and respondents from joint family scored high for openness, conscientiousness and extraversion. Unmarried respondents scored high for four personality traits i.e. openness, conscientiousness, extraversion, agreeableness followed by married respondent on neuroticism. Openness, extraversion and neuroticism were high in employed respondents followed by conscientiousness and extraversion in unemployed.

Table 4: Descriptive statistics (N = 396)

Variables	N			Mean			Std. Deviation		
Gender	Male	Female		Male	Female		Male	Female	
Openness	264	132		3.52	3.52		0.49	0.54	
Conscientiousness	264	132		3.47	3.44		0.48	0.51	
Extraversion	264	132		3.44	3.41		0.68	0.68	
Agreeableness	264	132		3.18	3.29		0.47	0.44	
Neuroticism	264	132		3.00	3.05		0.70	0.66	
Entrepreneurial Intention	264	132		3.19	3.21		0.22	0.23	
Age-Interval	15-20	20-25	25-30	15-20	20-25	25-30	15-20	20-25	25-30
Openness	54	147	195	3.51	3.49	3.53	0.55	0.51	0.50
Conscientiousness	54	147	195	3.55	3.51	3.40	0.49	0.47	0.49
Extraversion	54	147	195	3.37	3.50	3.40	0.60	0.64	0.72
Agreeableness	54	147	195	3.25	3.27	3.17	0.44	0.46	0.47
Neuroticism	54	147	195	3.01	3.00	3.04	0.67	0.67	0.71
Entrepreneurial Intention	54	147	195	3.21	3.22	3.18	0.23	0.23	0.21
Type of Family	Nuclear	Joint		Nuclear	Joint		Nuclear	Joint	
Openness	290	106		3.50	3.57		0.52	0.49	
Conscientiousness	290	106		3.46	3.47		0.46	0.55	
Extraversion	290	106		3.43	3.43		0.68	0.68	
Agreeableness	290	106		3.23	3.19		0.47	0.43	
Neuroticism	290	106		3.05	2.95		0.70	0.66	
Entrepreneurial Intention	290	106		3.20	3.17		0.23	0.21	
Marital Status	Married	Unmarried		Married	Unmarried		Married	Unmarried	
Openness	185	211		3.51	3.52		0.50	0.51	
Conscientiousness	185	211		3.40	3.51		0.50	0.47	
Extraversion	185	211		3.41	3.45		0.74	0.62	
Agreeableness	185	211		3.17	3.26		0.45	0.47	
Neuroticism	185	211		3.04	3.00		0.70	0.68	
Entrepreneurial Intention	185	211		3.19	3.20		0.22	0.23	
Occupational Status	Employed	Unemployed		Employed	Unemployed		Employed	Unemployed	
Openness	213	183		3.52	3.51		0.54	0.48	
Conscientiousness	213	183		3.40	3.53		0.51	0.44	
Extraversion	213	183		3.44	3.42		0.70	0.65	
Agreeableness	213	183		3.21	3.23		0.45	0.47	
Neuroticism	213	183		3.05	2.99		0.70	0.68	
Entrepreneurial Intention	213	183		3.21	3.18		0.24	0.21	

(Source: Processed data from SPSS 21)

Entrepreneurial Intention and Personality Traits

The relation of personality traits and entrepreneurial intention has been checked by correlation using entrepreneurial intention as dependent variable and personality traits as independent variables defined by factor analysis, represented by SPSS 21.

Factor Analysis

Two important measures are used to evaluate that data are appropriate for factor analysis or not, a statistical technique that looks at the underlying structure of interactions between variables: the Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure. Values nearer 1 in the KMO measure indicate greater suitability for factor analysis, which assesses the dataset's adaptability. Table 5 showed that the KMO value of 0.722 in this instance indicated that the data were presumably suitable for factor analysis. Bartlett's test determines whether or not the variables in the dataset are correlated. If the p-value is less than 0.05, the result is considered significant and implies that there is enough correlation between the variables. A highly significant correlation was indicated here by the low p-value (Sig. = .000). As additional evidence of the soundness of the analysis, the degrees of freedom (df = 105) and approximate chi-square value (2385.879) both quantified the strength of the association between the variables. These results, taken together, gave confidence to the factor analysis method of identifying the dataset's underlying structure.

Table 5: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.722
Bartlett's Test of Sphericity	Approx. Chi-Square	2385.879
	df	105
	Sig.	.000

(Source: Data processed through SPSS 21)

In table 6, the Principal Component Analysis (PCA) with Varimax rotation revealed five distinct dimensions of personality traits based on the statements. The first factor highlighted social and communicative traits, encompassing characteristics such as being talkative, outgoing and socially engaged. This factor suggested a predisposition towards interpersonal interactions and a preference for engaging with others. The second factor revolved around anxiety and sensitivity, capturing traits associated with worrying excessively, getting nervous easily and being sensitive to stressors. It indicated a tendency towards experiencing heightened emotional responses to various situations. The third factor emphasized originality and imagination, reflecting traits like creativity, innovation and a penchant for artistic experiences. Individuals high on this factor were likely to generate novel ideas and appreciate aesthetic pursuits. The fourth factor underscored work ethic and effectiveness, indicating traits such as diligence, thoroughness and efficiency in tasks. This dimension suggested a proactive and industrious approach towards accomplishing goals. Finally, the fifth factor highlighted compassion and forgiveness, encompassing traits related to being considerate, kind and forgiving towards others. This dimension reflected a predisposition towards empathy and understanding in interpersonal relationships. Overall, these five factors provided a nuanced understanding of an individual's personality, capturing a range of social, emotional, creative, work-related and interpersonal tendencies.

Table 6: Rotated Component Matrix

Statements	1	2	3	4	5
I am a communicative and talkative type of person	.835				
I am outgoing and social person	.840				
Sometimes, I become rude to others		.753			
I worry a lot about things		.914			
I get nervous easily		.898			
I see myself who is original, comes up with new ideas			.868		
I value artistic experiences			.805		
I have an active imagination power			.837		
I see myself who does a thorough job				.839	
I do things effectively and efficiently				.731	
I am having a forgiving nature					.778
I am considerable and kind to others					.833
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.					

(Source: Author's calculation from the output file of SPSS 21)

Table 7 showed the names of extracted factors with their Eigen values and percentage of variance explained by individual factors. Five unique dimensions were revealed by the factor analysis of personality traits: extraversion, neuroticism, openness, conscientiousness and agreeableness. Talkative and socially active people scored higher on the extraversion component, which measured the friendliness and outgoingness with explained variance of 25.680 per cent. Neuroticism with 17.252 per cent of variance, was characterised by emotional instability, including a propensity for stress and anxiety, as well as behaviours like becoming irritable with people and worrying a lot. Originality and a love of the arts were examples of qualities that were reflected in openness, along with inventiveness and a readiness to try new things. It explained 11.045 per cent of variance. Conscientiousness with 8.348 per cent of variance, was the state of organisation and diligence in work; those valued accuracy and efficiency will score higher. Warmth, empathy and cooperation were qualities that were associated with agreeableness (7.455 per cent of variance) and demonstrated a kind and understanding disposition towards others. A considerable amount of personality variance may be explained by each factor, which offered important insights into individual differences and trends in several domains of behaviour and cognition.

Table 7: Factors name with their percentage variance and eigen values

Factor Name	Statement	Eigen Value	Percentage Variance
Extraversion	I am a communicative and talkative type of person	3.760	25.68
	I am outgoing and social person		
Neuroticism	Sometimes, I become rude to others	2.588	17.25
	I worry a lot about things		
	I get nervous easily		
Openness	I see myself who is original, comes up with new ideas	1.657	11.04
	I value artistic experiences		
	I have an active imagination power		
Conscientiousness	I see myself who does a thorough job	1.252	8.34
	I do things effectively and efficiently		
Agreeableness	I am having a forgiving nature	1.118	7.45
	I am considerable and kind to others		

(Source: Author's calculation from the output file of SPSS 21)

Correlation Analysis

The correlation analysis between the variables is measured using Pearson's correlation analysis. The correlation analysis conducted on entrepreneurial intention and personality traits revealed several significant associations. Entrepreneurial intention showed a positive correlation with extraversion ($r = 0.182$, $p < 0.01$) and openness ($r = 0.250$, $p < 0.01$), suggesting that individuals who score higher on these traits were more likely to express entrepreneurial intentions. Conversely, there is a negative correlation between entrepreneurial intention and neuroticism ($r = -0.176$, $p < 0.01$), indicating that individuals with lower levels of neuroticism were more inclined towards entrepreneurship (Zhang et al., 2021). Additionally, conscientiousness demonstrated a positive correlation with entrepreneurial intention ($r = 0.108$, $p < 0.05$), suggesting that individuals who exhibited traits such as organization and diligence were more likely to pursue entrepreneurial endeavours. Agreeableness also showed a positive correlation with entrepreneurial intention ($r = 0.137$, $p < 0.01$), implying that individuals with a cooperative and considerate nature may also have entrepreneurial aspirations (Pandey et al., 2023). These findings provided valuable insights into the relationship between personality traits and entrepreneurial intentions, highlighting the potential influence of individual dispositions on entrepreneurial behaviour.

Table 8: Correlation Matrix

		Entrepreneurial Intention	Extraversion	Neuroticism	Openness	Conscientiousness	Agreeableness
Entrepreneurial Intention	Pearson Correlation	1	.182**	-.176**	.250**	.108*	.137**
	Sig. (2-tailed)		.000	.000	.000	.031	.006
	N	396	396	396	396	396	396

Extraversion	Pearson Correlation	.182**	1	.134**	.250**	.176**	.236**
	Sig. (2-tailed)	.000		.008	.000	.000	.000
	N	396	396	396	396	396	396
Neuroticism	Pearson Correlation	-.176**	.134**	1	-.176**	.041	-.034
	Sig. (2-tailed)	.000	.008		.000	.416	.496
	N	396	396	396	396	396	396
Openness	Pearson Correlation	.250**	.250**	-.176**	1	.328**	.133**
	Sig. (2-tailed)	.000	.000	.000		.000	.008
	N	396	396	396	396	396	396
Conscientiousness	Pearson Correlation	.108*	.176**	.041	.328**	1	.120*
	Sig. (2-tailed)	.031	.000	.416	.000		.017
	N	396	396	396	396	396	396
Agreeableness	Pearson Correlation	.137**	.236**	-.034	.133**	.120*	1
	Sig. (2-tailed)	.006	.000	.496	.008	.017	
	N	396	396	396	396	396	396
**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).							

(Source: Data processed through SPSS 21)

Conclusion

Although there are a lot of factors which are affecting a person's intention to start his own venture, main focus of the study was on the Big Five personality traits. The main aim of the study was to check the relation between Big Five personality traits and entrepreneurial intention while considering demographic differences.

From descriptive statistic, it was seen that gender, age, family type, marital status and occupational status were playing an important role in entrepreneurial intention. Further, it was found that the personality traits (extraversion, neuroticism, openness, conscientiousness and agreeableness) fostered entrepreneurial intention (Farrukh et al., 2017) as extraversion, openness, conscientiousness and agreeableness were positively correlated with entrepreneurial intention followed by a negative correlation between neuroticism and entrepreneurial intention. The results of this study further suggested that society can foster youths' competitions showcasing original ideas and future projects as a way to encourage creativity and imagination (Pandey et al., 2023).

Nations and institutions having the lack of funds for entrepreneurship, now have a way to initiate the process of strengthening the entrepreneurial mind set through individuals' aspirations to become entrepreneurs. Teachers at schools and universities can incorporate resources into their curricula to help students acquire the traits that are directly linked to entrepreneurial purpose. Government can help the rural youth to develop these traits by creating new programmes and activities that will help them to feel a sense of responsibility and increase their work efficiency. Rural youth ought to learn how to gather data regarding different opportunities i.e. different schemes, training programmes, creative business ideas, etc.

Recommendations and Suggestions

Based on the results of the study, following are some of the recommendations: first, data can be collected from adults with the knowledge about entrepreneurship. Second, future researchers can investigate other personality traits, also. Future researchers may employ potential mediating variables in their research, such as self-efficacy, culture, loss aversion bias, etc.

Reference:

- Alkhatib, K., Al-Aiad, A., Mustafa, M. and Alzubi, S. (2020).** Impact factors affecting entrepreneurial intention of Jordanian private universities students: a mediation analysis of perception toward entrepreneurship. *Sustainable and Energy Efficient Computing Paradigms for Society, Springer, Cham*, 53-65.
- Anonymous (2022).** Annual Reports. Ministry of Social Justice and Empowerment. <https://socialjustice.gov.in/writereaddata/UploadFile/58421681720758.pdf>.
- Barrick, M.R., Mount, M.K. & Judge, T.A. (2001).** Personality and performance at the beginning of the new millennium: what do we know and where do we go next? *International Journal of Selection and Assessment*, 9(1), 9-30.
- Carmines, E. & Zeller, R. (1979).** *Reliability and Validity Assessment (Sage University papers series. Quantitative applications in the social sciences; no. 07-017)*. Sage Publications.
- Chandrasekaran, S. & Narayanan, M. (2019).** A study on changing attitude of women entrepreneurship - a special reference towards role of self-help group. *International Journal of Multidisciplinary Research Review*, Special issue, 47-54.
- Chhabra, S., Raghunathan, R. & Rao, N.V.M. (2020).** The antecedents of entrepreneurial intention among women entrepreneurs in India. *Asia Pacific Journal of Innovation and Entrepreneurship*, 14(1), 76-92.
- Ciavarella, M.A., Buchholtz, A.K., Riordan, C.M., Gatewood, R.D. & Stokes, G.S. (2004).** The big five and venture survival: is there a linkage? *Journal of Business Venturing*, 19(4), 465-483.
- Costa, P.T. & McCrae, R.R. (1992).** *Neo Personality Inventory-Revised (NEO PI-R)*. Psychological Assessment Resources, Odessa, FL.
- Farrukh, M., Khan, A., Shahid Khan, M., Ramzani, S.R. & Soladoye, B. (2017).** Entrepreneurial intentions: the role of family factors, personality traits and self-efficacy. *World Journal of Entrepreneurship, Management and Sustainable Development*, 13(4), 303-317.
- Fiske, S.T., Gilbert, D.T. & Lindzey, G. (2010).** *Handbook of Social Psychology*. John Wiley and Sons.
- Goldberg, L.R. (1993).** The structure of phenotypic personality traits. *American Psychologist*, 48(1), 26-34.
- Hair, J.F., Sarstedt, M., Ringle, C.M. & Gudergan, S.P. (2017).** *Advanced Issues in Partial Least Squares Structural Equation Modeling*. SAGE publications.
- Hair, J.F., Babin, B.J., Anderson, R.E., Black, W.C. (2018).** *Multi variate data analysis*. Cengage Learning India.
- <https://cmie.com/kommon/bin/sr.php?kall=warticle&dt=20220912145132&msec=900>
- Kerr, S.P., Kerr, W.R. & Xu, T. (2018).** Personality traits of entrepreneurs: a review of recent literature. *Foundations and Trends VR in Entrepreneurship*, 14(3), 279-356.
- Kim, S. (2018).** Domains and trends of entrepreneurship research. *Management Review: An International Journal*, 13(1), 65-90.
- Kothari, C.R. (2004).** *Research Methodology: Methods & Techniques*. New Age International Publisher, New Delhi. 320
- Merrill, J.S., Chambers, T.M. & Roberts, W.A. (2008),** "Associations and barriers to intrapreneurship and entrepreneurship. *Management Review: An International Journal*, 3(1), 4-22.
- Miralles, F., Giones, F. & Riverola, C. (2016).** Evaluating the impact of prior experience in entrepreneurial intention. *International Entrepreneurship and Management Journal*, 12(3), 791-813.
- Nunnally, J. C. (1978).** *Psychometric theory*. New York: McGraw-Hill Inc.
- Olkin, I. and Sampson, A.R. (2001).** Multivariate Analysis: Overview, Editor(s): Neil J. Smelser, Paul B. Baltes, *International Encyclopaedia of the Social & Behavioural Sciences*, Pergamon. <https://doi.org/10.1016/B0-08-043076-7/00472-1>.

- Pandey, D.L., Uprety, S.K. & Risal, N. (2023).** Personality traits and their impact on the social entrepreneurial intentions of management students: a test of big five personality approach. *Journal of Innovation and Entrepreneurship, Springer Open*, <https://doi.org/10.1186/s13731-023-00342-8>.
- Peña, I., Guerrero, M., Pernía, J. L.G., & Montero, J. (2020).** *Global Entrepreneurship Monitor*. Informe GEM España 2019-2020. In Editorial de la Universidad de Cantabria eBooks. <http://doi.org/10.22429/euc2020.024>.
- Quan, X. (2012).** Prior experience, social network, and levels of entrepreneurial intentions. *Management Research Review*, 35(10), 945-957.
- Saeed, R., Mussawar, S., Lodhi, R.N., Iqbal, A., Nayab, H.H. & Yaseen, S. (2013).** Factors affecting the performance of employees at the workplace in the banking sector of Pakistan. *Middle East Journal of Scientific Research*, 17(9), 1200-1208.
- Singh, G. & DeNoble, A. (2003).** Views on self-employment and personality: an exploratory study. *Journal of Developmental Entrepreneurship*, 8(3), 265-281.
- Verheul, I., Thurik, R., Grilo, I. & Zwan, P.V.D (2012).** Explaining preferences and actual involvement in self-employment: gender and the entrepreneurial personality. *Journal of Economic Psychology*, 33(2), 325-341.
- Wang, J.H., Chang, C.C., Yao, S.N. & Liang, C. (2016).** The contribution of self-efficacy to the relationship between personality traits and entrepreneurial intention. *Higher Education*, 72(2), 209-224.
- Zhang, Y., Wang, P. & Zhao, Y. (2021).** Big five personality, academic entrepreneurial motivation and academic entrepreneurial motivation: a research method based on fuzzy set qualitative comparative analysis. *Frontier in Psychology*, doi: 10.3389/fpsyg.2021.799770.
- Zhao, H., Seibert, S.E. & Lumpkin, G.T. (2010).** The relationship of personality to entrepreneurial intentions and performance: a meta-analytic review. *Journal of Management*, 36(2), 381-404.

A Method for Improvisation of Electronic Data Exchange in E-Commerce Applications

Dr. Mohammed Shameer M C

Assistant Professor, Dept. of Computer Science,
Farook College(Autonomous), Kozhikode, India.

Miss. Mubeena V

Assistant Professor, Dept. of Vocational
Studies, Farook College, Kozhikode, India.

Abstract

Increasing popularity of communication technology and services has revolutionized the way business operates. Many businesses has migrated to new platform and incorporated online services like e-com services, mobile banking, mobile payments and m-commerce. These migrations exponentially increased the network traffic and bulkiness of data. This created bottlenecks in data exchange. So there is a demand for strong and secure means of business communications. As complete technological revamp is not possible, efficient use of existing resources is essential. Reducing the amount of data exchanged can also positively impact the efficiency of data transfer e-commerce applications. This research aims to integrate the LXML data interchange format into e-commerce applications. LXML is a lightweight data interchange format proposed for environments with resource restrictions. The performance of the new model is evaluated and found that it has clear advantage over the existing conventional data interchange formats.

Keywords: Electronic Data Exchange, E- Commerce, Data Exchange Format, LXML

Introduction

Electronic Data Exchange refers to the way to exchange of structured business data between organizations in a reliable and secure manner. This process facilitates automating business data transfer without human intervention, enabling businesses to communicate efficiently. At the same time eliminates the manual tasks required with traditional data exchanges. Advancement in field of internet and communication technology has profoundly transformed the way businesses operate by offering enhanced communication, innovations and global reach. This nurtured the growth of ecommerce and mobile commerce platforms.

As more businesses move online platforms, network traffic rises significantly. This requires robust infrastructure to handle the huge volume of data and user interactions. At the same time, heavy use of rich media led to the increased bandwidth consumption as well. With the rise of mobile commerce, networks must accommodate mobile traffic efficiently [1]. Businesses may need to enhance mobile responsiveness and ensure their infrastructure supports mobile users. High traffic can lead to latency, affecting the user experience. Businesses need to optimize their networks to minimize delays and ensure fast responses. As a result, a simple and yet feasible means of data exchange is essential to support the growing need [2].

As complete revamp of existing technology and infrastructure is seldom possible, effective use of existing resource is mandatory. Reducing the amount of data to be transmitted in business communication and effectively managing existing resources is crucial in this scenario. Use of lightweight and standardized data exchange formats streamline the business communications.

This research integrates the lightweight LXML data exchange format proposed in [3] in e-commerce transactions and evaluates the performance of the model in business data exchanges.

The later sections of this paper are organized as follows. Section 2 reviews the existing data interchange formats. Section 3 discusses the methodology used for the research. Section 4 explains the details of how the new LXML format in integrated and implemented. Section 5 highlights the experimental set up and evaluation performed. Section 6 analyses the result and section 7 concludes the research findings.

Literature Review

XML

XML is the most widely used data interchange format especially in business to business (b2B) applications. XML is a mark up language derived from SGML and is used to describe the syntax and semantics of structured and semi-structured data. It is a standard data interchange format for heterogeneous environment. XML supports a hierarchical organization data using custom tags. XML documents are human readable, dynamic and extensible in nature.

The wide spread used of XML in ecommerce application is mainly due to the following reasons [4][5]: (a) Human readable and self describing format suitable for storage and transmission of structured data, (b) platform independent and support interoperability among heterogeneous platforms and applications (c) inherent support for complex data structures, (d) open standard that make it easier to generate, parse and transmit.

Though XML is considered as the de-facto standard in ecommerce applications, it posses many drawbacks especially in resource constraint environments like m-commerce platforms [5][6][7][8].

- Document verbosity: XML make use of custom tags for representing data. Due to the use of large number of descriptive custom tags the documents size increases. Even though the descriptive tags improve the readability of the document, it shrinks the amount of data contained in the documents
- Heavily descriptive and redundant tags increase the transmission cost and other processing overheads.
- Complexity of data structures used for handling XML documents
- Resource intensive nature
- Security issues

JSON

JSON is another lightweight, platform independent data exchange format used in e commerce applications. It is an alternative format popularly used in RESTful APIs for web services [9]. JSON is a text based format allowing seamless communication between front-end applications and back-end services. It is comparatively easier to parse and extract data contained in the document. They are supported by many programming languages and databases.

The demerits of JSON as a format for data exchange in ecommerce applications includes [5][7]: (i) Lack of schema: A schema support to structuring and organizing the document and helps in parsing and checking the document validity. Absence of a schema makes the format more generic and error prone, (ii) JSON is a text based format with support to few data types. It does not support date time and other complex types. Hence it is very difficult to represent non text types; (iii) does not support namespaces and comments (iv) verbose and non extensible, (v) vulnerable to security breaches as sniffing JSON objects can easily identify object properties and alter its values.

CSV

CSV files are simple text based files commonly used for handling bulk amount of data uploads and downloads in ecommerce applications. They are ideal for representing structured data and are supported by many programming languages. The document sizes of CSV files are much smaller than XML and JSON making it suitable for bulk data handling. The disadvantages of this format includes: (i) Lack of standardization: it is an inconsistent format for data representation. This inconsistency leads to compatibility issues, (ii) Inability to represent hierarchical data due to data structure limitations, (iii) not suited for complex types, (iv) limited data types, (v) scalability and security concerns [10][11].

YAML

YAML is a data serialization and transmission standard utilized by various programming languages. It is lightweight and human-readable format, making it ideal for applications that store, process, and transmit data in distributed applications. YAML are human readable format that inherently support complex data structures [12]. They are mainly used in configuration files and data serialization. YAML is not a popular format like XML and JSON and every language has different comfort level in using this format. It has a complex structure and requires much expertise to write policy constraints. As the format heavily depend on indentation formatting, a minor change in intent may cause in processing failures [12][13].

Protocol Buffers

Protocol Buffers is a precise, language-neutral, platform-independent and extensible mechanism for serializing structured data developed by Google Inc. Protobuf is a binary data format that can handle versioning issues in server during system development. This format is similar to XML and JSON in terms of serialization but more precise and faster [14]. This format is considered as very effective for systems that communicate large amount of data in constrained environments. The disadvantages of protoBuf are [15]: (i) it is not a human readable format making it difficult for debugging and manual data inspection, (ii) Generating such a format requires

specific tools to compile schema files into code, making it complex to handle, (iii) No flexibility for applications with highly dynamic or unpredictable data structures, (iv) overhead in serialization and deserialization of data, (v) supported by limited programming languages.

Choosing the right data exchange format in e-commerce depends on specific requirements like data complexity, interoperability, performance, and ease of use [16][17]. Literature survey underlines that existing data exchange mechanism employed in e-commerce and m-commerce application are verbose in nature leading to larger payload size. Larger payload size increases the processing overhead and slower parsing which adversely affect real-time processing in high-traffic business environments. This performance bottleneck impact user experience as the amount of data communicated in ecommerce applications varies.

Modern business applications that give emphasis to speed and efficiency require a paradigm shift on existing data exchange mechanisms. The trend is shifting towards more lightweight, flexible, efficient and developer-friendly formats.

Methodology

LXML is a lightweight data interchange format proposed as an alternative for existing data interchange formats like XML and JSON [3]. The format is an extensible, schema aware and less verbose format suited for environments that possess inherent resource limitations and constraints. This format is much concise when compared to XML and JSON.

In this research work, different e-commerce applications are considered as candidates for experimentation. The pattern of how the data communicated between the front end and back end system in these applications are studied. The first candidate platform exposes XML based web services and the second application uses RESTful web services where JSON is used as the payload.

The payloads with XML and JSON format are converted to LXML formats and the transmission is simulated. The content density and transmission time required for each is evaluated and analysed. The results obtained in these experiments definitely provide quantitative and qualitative insights to the performance of data exchange formats employed in e-commerce application.

Implementation

Most of the e-commerce and m-commerce applications follow a multi-tier distributed architecture [16]. The architecture of the e-commerce system is shown in Figure 1.

The client side: The client side constitute web or mobile application where users interact with the system. This is the place where user searches for products or items, add to their cart and make payments. This layer should be attractive and elegantly presented for better user experience. Client side of mobile applications are designed for touch interactions, optimized for smaller screens.

Server-Side: The server side of the distributed application handles incoming requests from clients and provide the responses. The web server interacts with a layer that runs the business logic.

Database Layer: This layer holds the data and popular choices include relational databases, NoSQL Databases or CRMs.

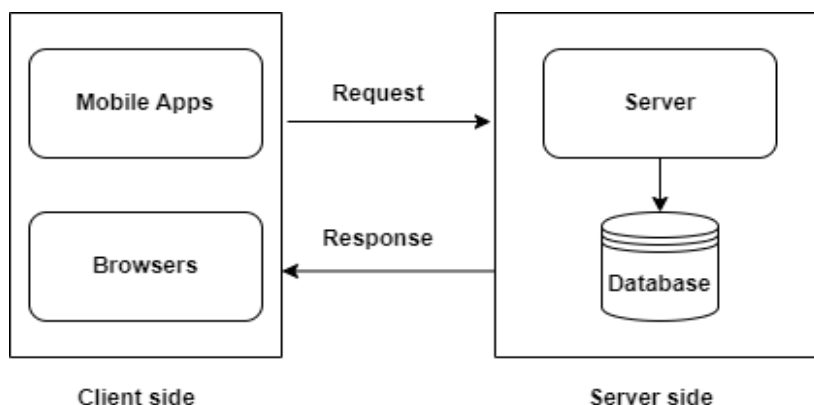


Figure 1: Architecture of an e-commerce system

LXML Format

The LXML is a hierarchical representation of data similar to XML. It is a format derived from XML. It uses level number instead of user defined tags. Each data is associated with its level number in its hierarchy. Since LXML uses level numbers instead of custom tags, this representation is very concise in nature.

XML and JSON messages can be converted to LXML format. A sample XML and JSON messages along with its equivalent LXML message is shown in the Figure 2.

<pre> <device> <category> <name>laptop</name> <series>A01</series> <model>M1</ model > </ category > <products> <product> <name>L01</name> <price>34000</price> <cpu>i3</cpu> <memory>8</memory> </product> <product> <name>L02</name> <price>44500</price> <cpu>i5</cpu> <memory>8</memory> </product> </products> </device> </pre>	<pre> { "device": { "category": { "name": "laptop", "series": "A01", "model": "M1" }, "products": { "product": [{ "name": "L01", "price": 34000, "cpu": "i3", "memory": 8 }, { "name": "L02", "price": 44500, "cpu": "i5", "memory": 8 }] } } } </pre>	<pre> device <00> <01>laptop <01> 01A <01>M1 <00> <01> <02>L01 <02>34000 <02>i3 <02>8 <01> <02>L02 <02>44500 <02>i5 <02>8 </pre>
(a) XML Message	(b) JSON Message	(c) LXML Message

Figure 2: A sample XML, JSON messages and its equivalent LXML message

The LXML messages are created according to a schema. This schema provide information about the root tags, container tags, level of nesting and other meta data information about the document. This schema is responsible for parsing and extracting data out of the LXML document. The schema of the LXML message is shown in figure given below.

<pre> <device> <category> <name>laptop</name> <series>A01</series> <model>M1</ model > </ category > <products> <product> <name>L01</name> <price>34000</price> <cpu>i3</cpu> <memory>8</memory> </product> <product> <name>L02</name> <price>44500</price> <cpu>i5</cpu> <memory>8</memory> </product> </products> </device> </pre>	<pre> device <00> <01>laptop <01> 01A <01>M1 <00> <01> <02>L01 <02>34000 <02>i3 <02>8 <01> <02>L02 <02>44500 <02>i5 <02>8 </pre>	<pre> <device> <category> <name></name> <series></series> <model></model> </ category > <products> <product> <name></name> <price></price> <cpu></cpu> <memory></memory> </product> </products> </ device> </pre>
(a) XML Format	(b) LXML format	(c) LXML Schema

Figure 3: XML message, LXML message and its schema

In this application, the client side make a HTTP request for data from the server. This request is generated according to the filter conditions and preferences given by the user. When the request reaches the server, the business logic layer extracts the data from the storage and creates an LXML message and transmitted to the client as an HTTP response. This LXML response is parsed to extract the data.

Experiment Setup and Evaluation

A test bed is configured using a laptop and an android mobile phone. The laptop has a core i3 processor with 4GB RAM and Microsoft Windows 10 as operating system. The mobile phone has Android version 12 as the operating system. The laptop has JDK version 1.8 installed. SoapUI tool is used for simulating servers. DOM parsing method is used for parsing XML and JsonParser is used for parsing JSON.

The responses generated from applications have a structure shown below. The root tag of the document is Products. This tag encloses many categories of products; say for example, mobile phone, laptop, desktop etc. Each category is further divided into sub categories. Sub categories are again classified into sub-sub categories. Each sub categories enclose many items. Each item contains 18-20 tags to describe the attributes of the item. There are thousands of such items in each document.

In this research, XML and JSON files generated from two different e-commerce application are considered. Here XML and JSON have almost similar structure. XML uses container tags where as JSON uses array objects. The structure of XML document is as shown

- Root Element: <products> contains multiple <product> elements.
- Product Element: Each <product> has a <productName> and a <categories> section.
- Categories: Each <category> has a <categoryName> and a <subCategories> section.
- Subcategories: Each <subCategory> has a <subCategoryName> and an <items> section.
- Items: Each <item> has a <name> and a <details> section, which contains multiple <detail> elements describing the item.

The structure of JSON file is

- Root Object: The root is products, containing a product array.
- Product Structure: Each product has a productName and a categories object.
- Categories: Each category has a categoryName and a subCategories object.
- Subcategories: Each subcategory contains a subCategoryName and an items object.
- Items: Each item has a name and a details object, with a detail array holding multiple descriptions.

The LXML format is compared with two prominently used data exchange formats- XML and JSON against three parameters. These three parameters are content density, parsing time and transmission time. These parameters are crucial for any data exchange applications especially in ecommerce field due to the bulkiness of data exchanged and processed [9][20][21].

Content Density

Content density refers to the amount of data contained in the format. It is measured as the amount of data contained against the total document size. The content density of a compact representation will be close to 1 and is considered as most suited for electronic data exchange. The content densities of XML, JSON and LXML are tabulated in Table 1.

XML	JSON	LXML
0.420	0.531	0.859

Table 1: Content densities of XML, JSON and LXML messages

Parsing Time

Parsing time is the time taken to process and extract data contained in the document. Parsing is an important performance criterion as it impacts the overall system performance. Validity of the document should be ensured before parsing. Parsing time depends on the technology used.

In this experiment, XML is parsed using DOM parser and JsonParser is used for parsing JSON. Custom APIs are developed to parse LXML messages. Here direct mapping to Data objects (DO) are performed to parse LXML. The LXML schema is used to validate LXML message before parsing. Parsing time of XML, JSON and LXML documents are tabulated in Table 2 and plotted in Figure 4.

No of Records	XML	JSON	LXML
1000	128	92	78
5000	536	326	260
10000	1318	779	632

Table 2: Parsing Time for XML, JSON and LXML messages for various number of objects

Transmission time

In any e - commerce or m-commerce applications, large volume of data is communicated between the server and the client device. Such bulk data is retrieved in pages and transactions spans multiple pages due to network or bandwidth constraints. In such cases, the total transmission time is the sum total of the time taken for each individual transaction and the time taken to process the messages.

For experimental purpose, documents having 1000 objects (items in sample transactions) are considered as a page. The download bandwidth is 5.1 Mbps. The results obtained are tabulated in Table 4 and plotted in Figure 5.

Pages	XML (in s)	JSON (in s)	LXML (in s)
1	2.231	1.351	0.642
2	4.465	2.685	0.642
3	6.974	2.685	0.642
4	9.861	5.231	1.277
5	12.197	5.231	1.277
6	15.360	7.332	1.277
7	18.948	7.332	2.614
8	22.476	9.742	2.614
9	26.258	9.742	2.614
10	29.544	12.591	5.546

Table 3: Page wise transmission time required for XML, JSON and LXML

Result and Analysis

From the table, it is clear that LXML is the most compact representation. A compact representation consumes less network bandwidth and other resources when compared to other bulky formats. The content densities of other formats is around 0.5 indicates that around 50% of the document size is used for meta-data like information and is not actual data. Such meta-data are forced to include either due to format specific constraints or to improve document readability.

From the result obtained in Table 2, It is very clear that LXML message has least processing overhead. Lower processing overhead considerably reduces the processing at the client side of the application. This enhances the end user experience and satisfaction.

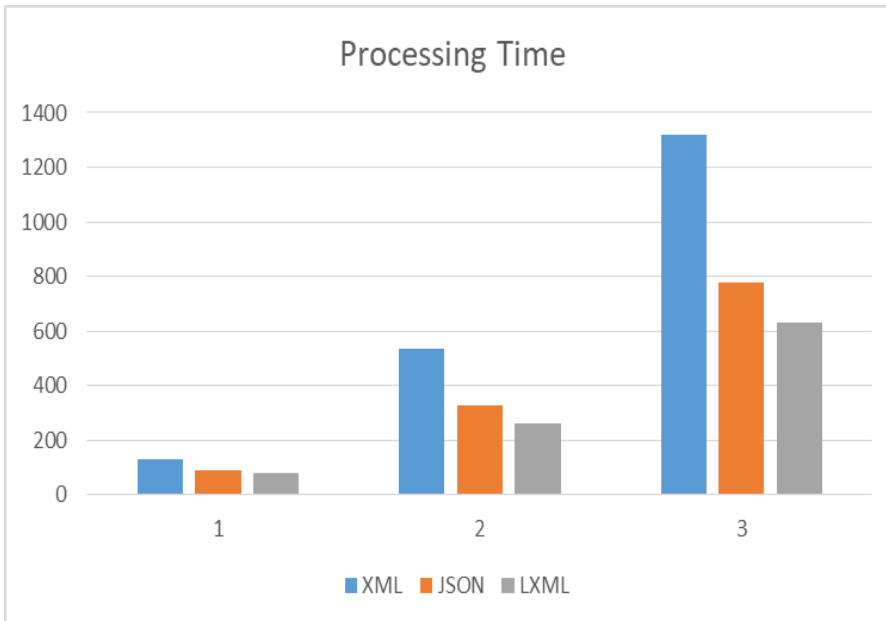


Figure 4: Parsing Time for XML, JSON and LXML messages for various number of objects

The cumulative transmission time for XML, JSON and LXML is presented in figure. The page wise processing and transmission of LXML message is the least among the three formats. This advantage is clearly due to the concise and compact nature of LXML format.

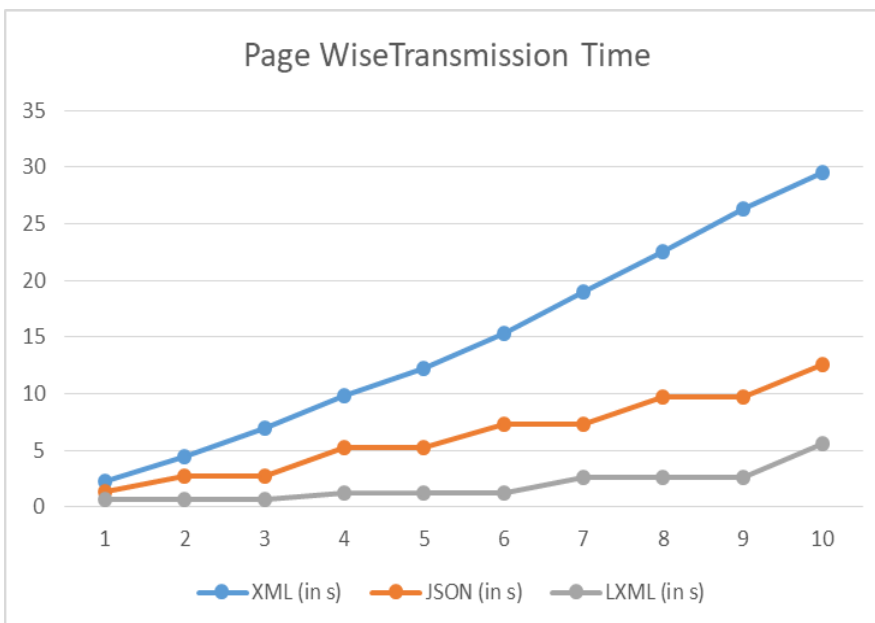


Figure 5: Page wise transmission time required for XML, JSON and LXML

Conclusion

There are many advances in e-commerce and m-commerce transactions to make it more convenient, secure and versatile in providing seamless interactions. Mobile computing helped financial sector to mobilize more financial services beyond payments. This includes bill payments, fund transfer to investment management. At the same time, mobile payment system also made huge transitions. Recently mobile payment applications and payment gateway interfaces gained much popularity.

Advances in the field exponentially increased the network traffic and the amount of data to be transmitted. Web services based on XML and JSON are the most commonly used approaches in ecommerce application where bulk amount of data is communicated. As the verbosity of XML and JSON is quite higher, data transmission using these conventional technologies results in wastage of network resources.

From the evaluation, it is clear that LXML is the most concise format for data transmissions. The content density of LXML is 104.5% higher than XML and 61.8% denser than JSON. Formats with higher content density consume less network resources for transmission, reduces the transmission cost and hence improve transmission efficiency.

Parsing and processing time is crucial for any data communication system. It is found that the parsing overhead is the least for LXML and is considerably higher in XML. LXML format has 38-52% advantage over XML and 8-20% advantage over JSON in parsing.

The research highlights that transmission of LXML message has considerable advantage over its counter parts. The page wise transmission time of LXML messages consume only 1/3rd of the time taken for XML messages and there is 52% advantage over JSON.

Higher content density and advantages in processing and transmission of LXML message makes it promising format for data exchange in business application especially in m-commerce applications with resource limitations.

Reference:

Ben Kiki O. YAML Ain't Markup Language (YAML) Version 1.2. Available at <https://yaml.org/spec/1.2/spec.html>, (Accessed March 2021).

Chen, B., Linz, D. D., & Cheng, H. H. (2008). XML-based agent communication, migration and computation in mobile agent systems. *Journal of Systems and Software*, 81(8), 1364–1376. doi:10.1016/j.jss.2007.10.026

Grzegorz Chodak, Grażyna Suchacka, Yash Chawla, HTTP-level e-commerce data based on server access logs for an online store, *Computer Networks*, Volume 183, 2020, ISSN 1389-1286, doi:10.1016/j.comnet.2020.107589.

G. Kaur and M. Fuad. An evaluation of protocol buffer. In *Proceedings of the IEEE Southeast Con 2010 (SoutheastCon)*, pages 459–462, 2010.

I. Tatarinov, S. D. Viglas, K. Beyer, J. Shanmugasundaram, E. Shekita, and C. Zhang, “Storing and querying ordered xml using a relational database system,” in *Proceedings of the 2002 ACM SIGMOD International Conference on Management of Data*. New York, NY, USA: Association for Computing Machinery, 2002, pp. 204–215.

Jackson JSON Processor Available at <http://jackson.codehaus.org/> (accessed on Sept 2024).

Jorstad, Ivar & Bakken, Elias & Johansen, Tor Anders. (2008). Performance Evaluation of JSON and XML for Data Exchange in Mobile Services. 237-240

K. Maeda. Comparative survey of object serialization techniques and the programming support. *Journal of Communication and Computer*, 9:920 – 928, 2012.

K. Maeda, "Performance evaluation of object serialization libraries in XML, JSON and binary formats," 2012 Second International Conference on Digital Information and Communication Technology and its Applications (DICTAP), Bangkok, 2012, pp. 177-182, doi: “10.1109/DICTAP.2012.6215346”

M. C. Mohammed Shameer, P. P. Abdul Haleem, Yazik K. Puthenpediyakkal, "A lightweight Data Exchange Format for Mobile Transactions", *International Journal of Computer Network and Information Security(IJCNIS)*, Vol.15, No.3, pp.47-64, 2023. DOI:10.5815/ijcnis.2023.03.04

Nicola, Matthias & John, Jasmi. (2003). XML parsing: A threat to database performance. *International Conference on Information and Knowledge Management, Proceedings*. 175-178. 10.1145/956863.956898.

P P Abdul Haleem and M P Sebastian (2014). An alternative approach for XML messaging, *International Journal of Advanced Research* ISSN NO 2320-5407, Volume 2, Issue 1, 251-294

Philipp Wehner, Christina Piberger, Diana Göhringer, “Using JSON to manage Communication between Services in the Internet of Things” 9th International Symposium on ReCoSoC, Montpellier, France 2014, pp 1-4.

Ramon Lawrence, The space efficiency of XML, *Information and Software Technology*, Volume 46, Issue 11, 2004, Pages 753-759, ISSN 0950-5849, doi:10.1016/j.infsof.2004.02.003.

Siau, Keng & Lim, Ee-Peng & Shen, Zixing. (2001). Mobile Commerce: Promises, Challenges and Research Agenda. *J. Database Manag.* 12. 4-13. 10.4018/jdm.2001070101.

Saurabh Zunke, Veronica D’Souza, JSON vs XML: A Comparative Performance Analysis of Data Exchange Formats, *International Journal of Computer Science and Network*, Volume 3, Issue 4, August 2014

Sol Chen, (2023). CSV Files: Use cases, Benefits, and Limitations, Available at <https://www.oneschema.co/blog/csv-files>. (accessed on Sept 2024)

Soap ui, Available at <https://www.soapui.org/tools/soapui/> (accessed on Aug 2024).

White G, Kangasharju J, Brutzman D, Williams S (2007). Efficient XML interchange measurements note. Available at <http://www.w3.org/TR/exi-measurements/> (accessed on May 2020).

W. Li and Y. Liu, "Application of XML in E-commerce," 2009 WRI World Congress on Software Engineering, Xiamen, China, 2009, pp. 262-264, doi: 10.1109/WCSE.2009.36.

X. Zhu, Z. He, and S. Shi, “On an enhancement of xml applied for mobile e-commerce,” *Journal of Electronic Commerce in Organizations*, vol. 10, no. 1, pp. 113–26, 2012.

Exploring the Decades of Research on Earnings Management: A Longitudinal Bibliometric Analysis

Manu Abraham

Research Scholar, Cochin University of
Science and Technology (CUSAT)- Kochi,
Kerala, India

Santhosh Kumar S

Professor, Cochin University of Science and
Technology (CUSAT)- Kochi, Kerala,
India

Abstract

Earnings management is one of the controversial cum enthusiastic research dimensions among academicians and researchers since the mid of 1980s. The purpose of this study is the systematization of literature to analyze evolution, development, and present trends in earnings management research. The study covers 3742 articles on Earnings Management from 1987 to 2023 indexed in SCOPUS and the Web of Science databases. R Studio, Biblioshiny, and Vos Viewer software were used to analyze bibliometric data over the period. The present study attempts to systematize the literature on earnings management to analyze how the research on EM has evolved over the period and the development of Earnings Management literature in each quadrille. The study reveals that the research in the pre-sox era gave more thrust to the development of cross-sectional models for the detection of accrual-based Earnings Management. However, the research on Earnings Management had shifted to managerial discretions based on real transactions in the post-SOX era. As compared to the accrual-based Earnings Management, the real-based Earnings Management is comparatively difficult to detect and it resulted in the development of models to estimate Real Earnings Management proxies. Later, in the post-GFC era, the focus of Earnings Management research was redefined towards investor protection due to the collapse of the global economy that led to the erosion of investors' wealth. In the modern era, the research on Earnings Management is developing towards non-financial disclosure dimensions such as ESG framework (Environmental, Social, and Governance), green reporting, CSR compliance, and so on. Research on EM can be extended to various dimensions such as non-financial disclosure, reporting bias, foreign ownership, and incapability of legislation to mitigate real earnings management practices. The findings of the study will be fruitful for policymakers and managers in decision-making, especially in addressing the quality of non-financial disclosures to secure the interest of investors.

Keywords: Earnings Management, Investor Protection, SOX, IFRS

Introduction

The academicians have addressed the issue of discretionary managerial practices even since the 1980s. The concept of Earnings Management (Hereafter, EM) was defined for the first time by Healy (1985) as a purposive intervention in the reported figures to demonstrate financial results in a way that is beneficial to the insiders of the company. Such benefits can be bonuses or managerial commissions (Jones, 1991), better credit ratings (Demirtas & Cornaggia, 2013), reduction in taxable income (Guenther, 1994), favorable proceeds during public offerings (DuCharme, Malatesta & Sefcik, 2004), and so on. Nevertheless, these insider benefits were driven by the intentional manipulation of financial reports. The flexibility in accounting standards and provision for accounting choices has resulted in the asymmetry of information and adversely affected the fairness of reported figures (Dichev *et.al*, 2013). Such information asymmetry is the basis of EM practices that can influence the decisions of potential investors who make investment decisions based on such reported figures (Richardson, 2002). Yet, the emergence of globalization and technological advancements in the early 90s lead to information efficiency all over the world (Hussain *et. al*, 2022).

However, EM has become the subject of interest to the general public and researchers following the global scandals in the early 2000s such as Xerox, Enron, and WorldCom. It was evident that managers were intervening in the reported figures by exploiting the provisions in GAAP and other regional accounting standards (Dechow & Skinner, 2000). Following these global scandals, the USA passed the Sarbanes Oxley Act in 2002 to restore the confidence of investors and it is considered to be a legislative milestone in the regulation of managerial discretions (Cook Huston & Omer, 2008; Chan, Farrell & Lee 2008; Abraham & Kumar, 2023¹). Mandatory adoption of IFRS has also reduced the level of managerial discretion in financial reporting (Zeghal, Chtourou & Sellami 2011). Also, the introduction of various corporate governance codes such as the Common Code in Germany and Tabaksblat in the Netherlands has mitigated the manipulation of earnings at the international level (Chih, Shen & Kang, 2008). The ultimate purpose of all these enactments and legislations was the protection of investors from earnings shocks (Leuz, Nanda & Wysocki, 2003). However, the asymmetry

of information in the financial statements has affected not just the confidence of investors but also the future performance and prosperity of the entity in the long run (Gunny, 2010). So, the protection of potential investors has become a global issue and it induced more in-depth research in analyzing discretionary managerial practices (Sun & Rath, 2010). Hence the first research article on EM appeared in 1987, a comprehensive systematization of literature is essential to address the evolution, growth, and development of EM research.

So, the present study considers research articles that appeared in Scopus and Web of Science from 1987 to 2023. The remainder of the article is organized into five chapters. The first chapter, Introduction, gives an overview of the study and is followed by a Literature review in the second chapter that provides insights into previous studies. In the third chapter methodology and techniques applied in the study are described. The analysis and interpretation of bibliometric data are depicted in Chapter 4 and the final chapter summarizes the findings of the study along with the scope for further research.

Review of Literature

Research on earnings management has exclusively begun with the introduction of discretionary accruals as a proxy for detecting earnings management that segregates abnormal accruals from total accruals (Healy, 1985; DeAngelo, 1986). One of the main sources for manipulating accruals is the provision for bad debts which is used as a tool for reducing taxable income (McNichols & Wilson, 1988). These kinds of provisions and accounting choices create an information asymmetry between the insiders (managers) and outsiders (Investors), leading to EM practices using discretionary accruals (Schipper, 1989). Such information asymmetry enabled companies to rely on discretionary income-decreasing accruals during import relief investigations to reduce reported numbers (Jones, 1991). However, troubled companies tend to inflate their earnings using discretionary accruals to avoid the violation of their debt covenants (Myres & Skinner, 2006; Defond & Jiambalvo, 1993). Up to the mid-1990s, Jones (1991) was the most prominent model in estimating discretionary accruals (DAs). Later, the accounts receivables were adjusted with changes in revenue to refine the estimation of DAs by addressing the tendency to manage earnings using non-cash revenue (Dechow *et.al*, 1995). However, it was Beneish (1997) who formulated an EM index score by compiling various indices such as SG&A, Depreciation, Gross margin, receivables, and total assets to total accruals to analyze the magnitude of accrual management. Following this, Kothari (2005) has addressed the importance of performance aspects by incorporating return on assets into the modified Jones model. Up to 2006, The concept of earnings management was confined to discretionary accruals until RoyChowdhury (2006) addressed the issue of Real earnings management (REM) that results from the abnormality in R&D expenditure, production cost, and cash flow from operations. Thus, earnings management is considered to be the outcome of both real and accrual manipulation in the reported figures (Ferentinou & Anagnostopoulou, 2016; Alhadab, Clacher & Keasey, 2015). One of the major motives behind earnings management is to make high proceeds from public offerings using income-increasing accruals (Teoh, Welch & Wong, 1998a). However, firms with aggressive EM practices during public exhibit underperformance in terms of lower stock returns (Teoh, Welch & Wong, 1998b). There are a lot of motives that induce the insiders to manage their earnings such as favorable credit ratings in the market (Demirtas & Cornaggia, 2013), managerial compensation (Aljifri, 2007), market speculations (Chen, Elder & Hung, 2010), effective tax rates (Guenther, 1994), and Stock markets incentives (Cheng & Warfield, 2005). The composition of independent directors (Chen, Cheng & Wang, 2015), multiple directorships (Sun, Lan & Liu, 2014), CEO duality (Baker *et.al*, 2019), and family control over the board (Achleitner *et.al*, 2014) also affect the quality of reported earnings as it can prioritize insider interests over the public interest. Even though earnings management practices benefit the insiders, they ultimately affect the wealth of potential investors (Gopalan & Jayaraman, 2012; Abraham, 2024). So, to protect investors from such insider manipulations, IFRS was implemented at the international level (Jeanjean & Stolowy, 2008). Nevertheless, the adoption of IFRS has intensified the magnitude of discretionary accruals as compared to the non-IFRS period (Callao & Jarne, 2010). Also, introducing corporate governance codes at the global and regional levels reduced unethical business practices in financial reporting (DHU & HBP, 2019). So recent studies in earnings management are more interested in addressing the issue of investor protection in different dimensions such as sustainability reporting, ESG compliances, foreign ownership, and so on.

Thus, it is evident from the literature that research on earnings management is dynamic and reports diverse and contradictory results over the period. So, the systematization of literature is essential to analyze the evolution and development of earnings management literature. Bibliometrics is a branch of information science that analyzes the bibliographic aspects quantitatively for the systematization of literature (Pritchard, 1969) and it is developed from the statistical bibliography introduced by (Hulme, 1923). The impact of a particular research area over the period can be analyzed using document citations, author citations, relevant keywords, and thematic clustering (Glanzel, 2015). So, the present bibliometric study is based on bibliographic data from 1987 to the present to develop scientific knowledge through the systematization of literature on earnings management by

identifying the most relevant keywords in the previous studies. Apart from considering a single database, this study is based on publications indexed with SCOPUS and Web of Science to get a more refined picture to analyze the evolution, growth, and recent developments in EM research by dividing the entire period of EM research into different timelines to refine the results. The present study aims to analyze the growth and development of research on earnings management by quadrisecting the entire research period (1987 to 2023)

Data and Methodology

Bibliometric analysis is inevitable when a large body of literature over a long period is systematized scientifically (Baker *et.al*, 2020). Thus, the present study follows a timeline approach to get more comprehensive insights into the earnings management literature. So, based on through literature review over the period (1987-2023) we quadrisect the entire literature into the evolutionary era (1987-2002), post SOX era (2003-2008), the post-crisis era (2009-2017), and the modern era (2017-2023). Bibliometric data for the study has been retrieved from SCOPUS by Science Direct and Web of Science (WoS) by Thomson Reuters databases, which are considered to be the most comprehensive and reliable in scientific citations. We used keywords such as “Earnings Management” “Accrual Earnings Management” “Real Earnings Management” “Accounting quality” “Accrual quality” and “Earnings quality” to get more refined data that address managerial discretionary practices. Search results were filtered into ‘English only’ articles in the field of business, finance, and management it was extracted from WoS in *plain text* format and from SCOPUS in *BibTeX* format to analyze the same using the Bibliometrix package in R-software to perform citation-based analysis and visualization of extracted data were done using VOS viewer. In total, we found 4822 articles (3300 from SCOPUS and 1522 from WoS), duplicate articles (1080 articles) were removed using the *mergeDbsource* command in R-Studio, and the final data stood at 3742 articles. Final data were analyzed using three indicators such as quantity indicators (to measure productivity), quality indicators (to analyze the citation frequency), and structural indicators (to estimate the linkages between authors and publications).

Data Analysis and Interpretation

Summary statistics of bibliometric data show that on average, the articles on EM are 7.51 years old and have 38.51 citations over the period. 3742 articles in the study are authored by 5869 authors, out of which 438 articles are single-authored in nature. It indicates the relevance of EM research at the international level. On average, co-authors per document stood at 2.66 and 13.76% of articles have resulted in international co-authorship.

Table I. Overview characteristics

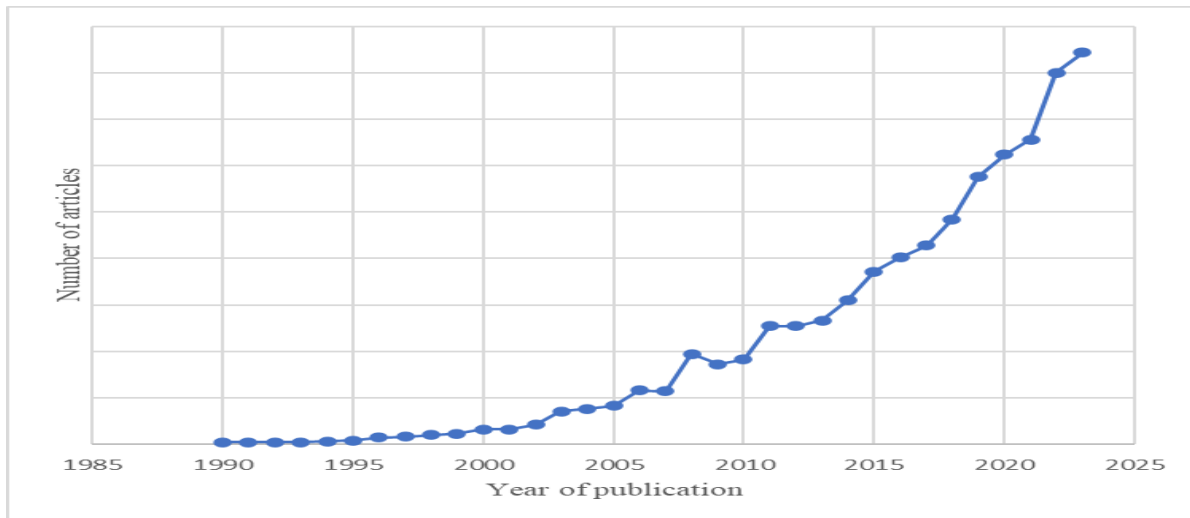
Particulars	Description
Time frame	1987:2023
Document type (Journals)	3742
Keywords used for data extraction	“Earnings Management” “Accrual Earnings Management” “Real Earnings Management” “Accounting quality” “Accrual quality” and “Earnings quality”
Research Domain	Business, Finance, and Management
Average document age	7.51
Average doesn't citations	38.51

Source: Biblioshiny

Since the evolution of EM research, the most used keywords in the articles addressing managerial discretion are NDA (non-discretionary accruals – 2182 times), DA (discretionary accruals – 981 times), Accrual quality – (576 times), Corporate governance – (453 times), and information asymmetry (391 times). So, the frequent occurrence of these keywords ultimately leads to nothing other than ‘investor protection’ which is considered to be the crux of earnings management research. Among the documents, Dechow (1995) and Kothari (2005) are the most cited articles (with 3971 and 3659 citations respectively) at the global level as these two have developed the most prominent models in the detection of discretionary accruals. *Journal of Accounting and Economics*, *Accounting Review*, and *Journal of Finance and Economics* are the most impactful journals with 10049, 9350, and 7138 citations respectively. As far the country-wise contributions are concerned, 33.21% of articles belong to the USA followed by 12.27% from China. Due to the financial advancements in emerging markets, now research on EM seems to be booming due to the increase in the inflow of foreign capital to emerging economies such as India, South Korea, Malaysia, and so on. Also, the mandatory adoption of IFRS

and corporate governance mechanisms has increased the scope for EM research among researchers and academicians.

Figure I. Year-wise growth in earnings management research



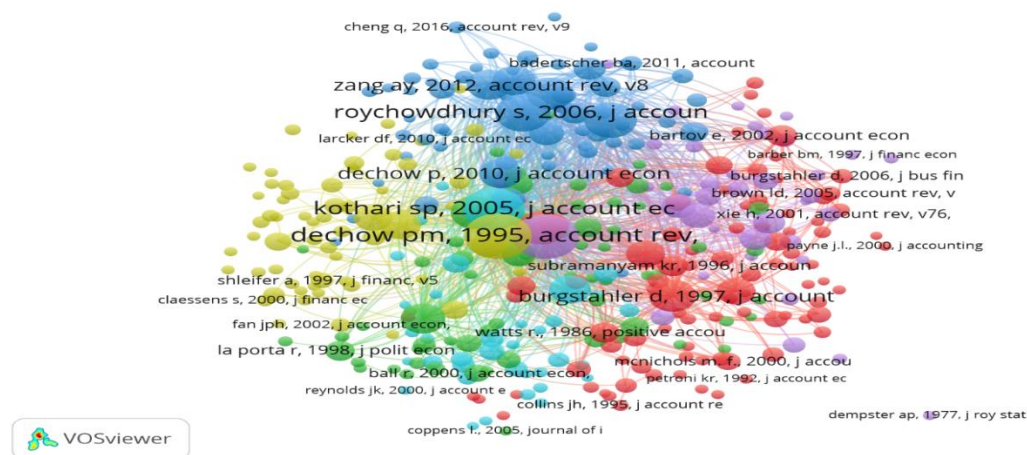
Source: Biblioshiny

It is also evident from Figure 1 that the interest in EM substantially increased in 2008-09 following the financial crisis that questioned the fairness and transparency of financial statements (Türegün, 2020). Thus, the number of publications almost doubled (107 articles) in 2008-09 as compared to the previous years following the global financial crisis (GFC) that created a threat of wealth depletion among potential investors at the global level (Persakis & Iatridis, 2016). Also, the international co-authorship has become 20.61 since 2010 and at present, it stands at 23.79%. Thus, the magnitude of international co-authorship has almost doubled since the GFC portrays the significance of EM research at the global level that aims at mitigating the information asymmetry to protect the interest of potential investors.

Co-citation Analysis on EM Research

The technique of co-citation analysis was introduced by Small (1973) and Heyes (1999) to analyze the most relevant publications in the concerned area. So, structure analysis of the most prominent research works on EM is depicted in Figure 2 using VOS Viewer software. One of the major motives behind the deliberate intention behind EM practices is to manipulate the earnings either to increase the profit or to reduce the losses (Burgstahler & Dichev, 1997) are shown in Cluster 1 (Red color). Such managerial discretions using the accruals reflect better economic value and it is also reflected in the stock prices (Subramanyam, 1996). Healy (1985) is the most cited article in the cluster that found that bonus plans for insiders are positively associated with their discretionary policies. Whereas, Degeorge (1999) revealed that insiders manage their earnings to meet the expectations of market analysts by maintaining recent performance or by reporting positive earnings.

Figure II. Co-citation network on EM research

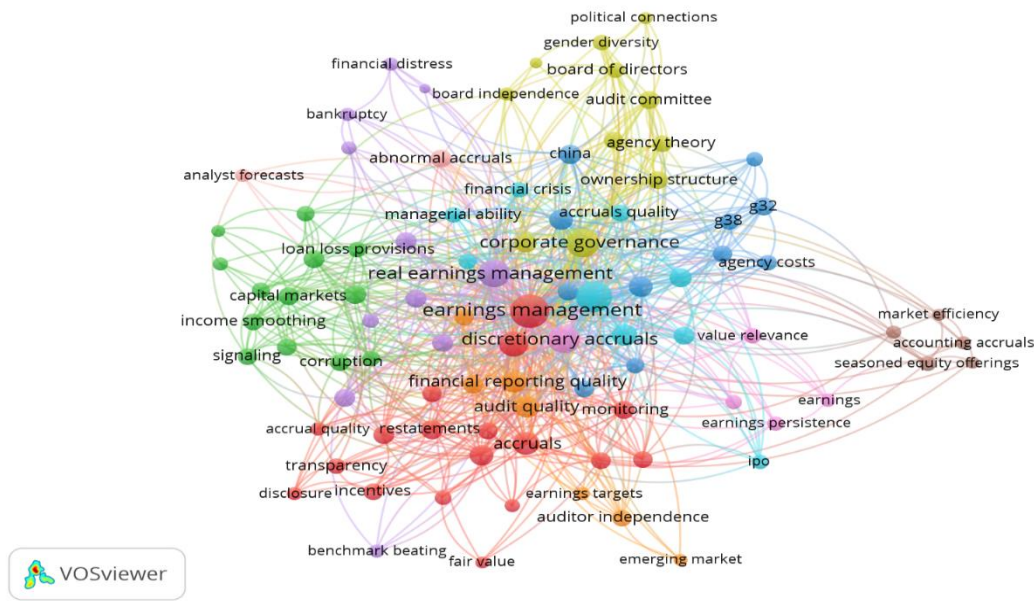


Source: VOSviewer

Cluster 2 (Green color) depicts the research on earnings management that points toward the protection of investors from managerial discretions. Leuz (2003) found that strong legislation and enactments mitigate discretionary practices and enhance the quality of reported earnings. Whereas, Burgstahler, Hail & Leuz (2006) documented that the magnitude of earnings management is higher among private firms as compared to public firms due to its compliance with strong compliance to the legal system. When investor sentiments are high, managers strategically use abnormal accruals to overstate the earnings to increase the stock return (Simpson, 2013). Also, (Marquardt & Wiedman, 2004) posit that there is a decrease in the value relevance of earnings among the firms with aggressive accruals during the year of equity offerings. Apart from accrual-based earnings management, the research on EM has also started to address the managerial discretions based on real-based transactions (Cluster 3 -Blue color) through abnormality in the production cost, cash flow, and discretionary expenses (Roychowdhury, 2006). Since the passage of the SOX Act in 2002, there has been a shift in managerial discretions from AEM to REM to increase compensation based on equity (Cohen, Dey & Lys, 2008). The passage of the SOX Act has improved the internal governance mechanisms that reduced the extent of managerial discretion using real transactions (Cheng, Lee & Shevlin, 2016). However, in consideration of the relative costs, managers tend to use real earnings management and accrual earnings management as substitutes (Zang, 2012). So, to protect investors from such managerial discretions, governance mechanisms were introduced to EM research (Cluster 4 – Yellow color) following the article by Jensen and Meckling (1976) that depicts the relationship between agency cost with managerial behavior. Xie, Davidson & DaDalt (2003) found that an increase in the frequency of Audit and Board committee meetings and the financial or corporate background of the members are very effective in mitigating the level of discretionary accruals. Srinidhi, Gul & Tsui (2011) also documented that the inclusion of female directors on board and audit committees has substantially enhanced earnings quality. It is also evident that the presence of reputed institutional investors also reduces the level of managerial discretion (Chung, Firth & Kim, 2002). Thus, research on EM has been moving into numerous aspects and multiple dimensions to adapt to the changes and developments in the micro and macro environment.

Thus, to portray the relevant focal points of EM research over time, we have created a co-occurrence map using VOS viewer by incorporating recurrent keywords that appeared in the publications are shown in Figure 3. Here, cluster 1 (Red) is focused on the keyword ‘earnings management’ with the superior occurrence that exhibits linkages with various keywords such as financial reporting quality, audit quality, transparency, institutional investors, accrual quality, and so on. So, the cluster demonstrates the association between earnings management and the quality of reported figures in the financial statement. Whereas, cluster 2 (Blue) shows the linkages of earnings management towards keywords such as IFRS, accounting standards, conservatism, earnings quality, and so on. So here the cluster envelops the impact of various legislations and enactments on managerial discretions.

Figure III. Co-occurrence in EM Research



Source: VOSviewer

At the same time, cluster 3 (yellow) documents the linkages of the keyword ‘corporate governance’ towards various dimensions such as audit committee, gender diversity, ownership structure, agency theory, board of directors, and so on. So, cluster 3 demonstrates the role of governance mechanisms in regulating managerial discretions. Whereas, cluster 4 (purple) depicts the keyword ‘real earnings management’ and its various dimensions in EM research such as financial distress, bankruptcy, long-run performance, profitability, and so on. Thus, cluster 4 gives an overview regarding the consequences of real earnings management even though its detection is comparatively difficult as compared to accrual earnings management. Although, cluster 5 (green) exhibits multiple approaches in earnings management using keywords such as loan loss provisions, signaling, tunneling, dividend, income smoothing, and so on. Here the cluster mainly shows various strategies and dimensions in the management of earnings by the insiders for their private gains and benefits.

So, based on a thorough literature review we have found some significant contributions towards earnings management research that incorporate timely developments and progress in managerial discretionary practices are depicted in Table II.

Table II. Glimpse of Major Milestones in Earnings Management Literature

Year	Author	Contribution to literature
1985	Healy	The first model for DA estimation by presuming mean reversion mechanism for NDA
1987	R. Jennings	Unsystematic security price movements during the week of earnings forecasts
1988	McNichols & Wilson	Use of provision for bad debts as an income-decreasing mechanism
1989	Schipper	Asymmetry of information between insiders and outsiders
1991	Jones	Managing of earnings to increase the amount of import relief grant
1995	Dechow	Incorporated Sales-based manipulation into the DA estimation model
1997	Burgstahler & Dichev	EM as a technique to increase earnings or to decrease losses
1998	Teoh, Welch & Wang	Unusual accruals during IPO lead to poor stock returns in the future
1999	Healy & Wahlen	Coined comprehensive definition of earnings management
2000	McNichols	Analysed Research design issues through specific and aggressive accruals

2003	Leuz	Addressed investor protection at the international level
2006	Burgstahler	Reporting incentives behind managerial discretion
2006	Roychowdhury	Estimation of REM through 3 proxies
2010	Callao & Jarne	Impact of IFRS in managerial discretions
2012	Gopalan & Jayaraman	Insider incentives and motives behind EM practices
2013	Hasnan	Evidence for EM before the year of fraudulent financial reporting
2014	Filip & Raffournier	EM behavior during the financial crisis period
2015	Ali & Zhang	Overstatement of earnings is more during the early years of CEOs
2016	Obigbemi	Association between board meetings and EM practices
2017	Lo <i>et.al</i>	Effect of EM on the transparency of financial reporting
2018	Almahrog	Impact of CSR on EM practices
2019	Liu & Lee	Effect of CSR on tax avoidance mechanisms
2021	Velte	Carbon performance, Environmental performance, and EM behavior
2022	Yuan	Irregularities in corporate financial reporting and ESG disclosure
2023	Aqabna	Impact of EM on CSR and Firm Performance during COVID-19

Source: own data after reviewing the available literature

It is evident from the literature that the research on EM is still evolving and diverging into multiple dimensions. A composite co-occurrence analysis won't be enough to get the evolution, growth, and development in earnings management research. So, based on the literature, we are interpreting the research on EM by segregating the period of the study into the pre-SOX (1987-2002), post-SOX period (2003-2008), post-GFC era (2009-2016), and Modern era (2017 to 2023) to get more comprehensive and fruitful interpretations on EM research.

Pre-SOX era (1987-2002)

During the initial phase, the detection of discretionary accruals (Proxy for EM) began with the assumption of mean reversion of non-discretionary accruals (NDA) by Healy (1985) and it was followed by DeAngelo (1986) with a presumption of random walk movement in NDA. However, these models were not able to account for external factors, and Jones (1991) incorporated depreciation expenditure and changes in revenue to estimate NDA. Later, the Jones model (1991) was modified by Dechow (1995) by addressing the effect of sales-based manipulation to widen the approach to the estimation of discretionary accruals. One of the major challenges in EM research is the proper estimation of DA (discretionary accruals), the proxy for EM that results from the information asymmetry.

Figure IV. Co-occurrence in pre-SOX Era



Source: VOSviewer

So, the majority of the research during the pre-SOX era has highlighted the asymmetry of information between managers and investors of the company (Coller & Yohn, 1997). Such asymmetry of information is more common among firms expected to yield higher market reactions as compared to firms expected to yield lower market reactions (Yohn, 1998). Managers manage their earnings using income-increasing accruals to maximize their bonus plans in the short run by exploiting the information asymmetry (Guidry, Leone & Rock, 1999). The impact of asymmetry of information is also reflected in the valuation of the firm if the value-maximizing investors and managers are not properly informed about the firm prospects (Chaney & Lewis, 1998). Based on such information asymmetry, McNichols (1989) found that earnings forecasts are reflected in the short-run stock price movements till the reversal mechanism of such information asymmetry in the capital market. Such information asymmetry is also visible during IPOs (Initial Public Offerings) resulting in poor stock returns in the succeeding years (Teoh, Welch & Wong, 1998). Thus, abnormal accruals in the pre-IPO period can increase proceeds from IPOs but it affects the future returns to the investors (DuCharme & Malatesta, 2001). Apart from IPOs, aggressive accrual management during seasoned equity offerings (SEOs) also resulted in underperformance in the long run, adversely affecting the subsequent returns (Teoh, Welch & Wong, 1998). So, the research on earnings management during the initial phase was mainly focused on the development of DA estimation models and addressing the information asymmetry during various corporate events. Such information asymmetry leads to aggressive EM practices that have witnessed major global scandals such as Waste Management (1998), Enron (2001), WorldCom (2002), and so on.

Post-SOX Era (2003-2008)

Global scandals in such multinational corporations have questioned the fairness and transparency of financial statements (Xu, Taylor & Dugan, 2007). So, the need for a regulatory mechanism to protect investors from fraudulent financial reporting has gained attention at the international level (Leuz, Nanda & Wysocki, 2003). Thus, to restore the confidence of investors USA has passed the Sarbanes Oxley Act (SOX) in 2002 that ensures stringent recordkeeping requirements. Following the SOX Act, various legislations such as the Tabaksblat Code in the Netherlands and the Common Code in Germany were enacted to ensure the protection of investors from fraudulent reporting.

Figure V. Co-occurrence in the post-SOX Era



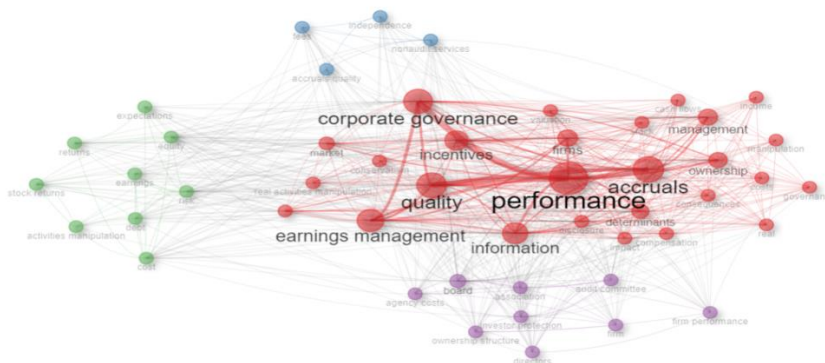
Source: VOSviewer

Thus, during this era, the concept of corporate governance emerged at the global level to reinstitute the well-being of stakeholders as well as potential investors (Man & Wong, 2013). Following the corporate governance regime, the frequency of board and audit committee meetings and the financial corporate background of committee members have reduced the level of DCA (discretionary current accruals) (Xie, Davidson & DaDalt, 2003). So, the ignition of corporate governance mechanisms at the global level has resulted in the enhancement of competitiveness at the international level (Carney, 2005). In the meantime, return on asset (ROA) was incorporated into the DA estimation model to address the performance aspects (Kothari, 2005). However, the concept of EM was not confined to the discretionary accrual (DA) aspects as the managers started to manage their earnings using real transactions (Gunny, 2005). So, the detection of REM (real earnings management) was pioneered by Roychowdhury (2006) through various proxies such as abnormal production cost, abnormal cash flow from operations, and abnormal discretionary expenditure. Thus, during the post-SOX era, the enactment of corporate governance mechanisms enhanced public confidence and the introduction of the Roychowdhury model has bisected earnings management into accrual-based and real-based EM practices (Xu, Taylor & Dugan, 2007).

Post-GFC Era (2009-2017)

Subprime lending and the housing market bubble led to the Global Financial Crisis (GFC) in 2008 which brought down numerous MNCs such as Lehman Brothers, Merrill Lynch, HBOS, and so on. So, it was evident that various discrepancies in financial reporting such as securitization of assets, fair value reporting, and loan loss provisioning have affected the market discipline (Barth & Landsman, 2010). However, the magnitude of EM, especially managerial discretions through real-based transactions was lower compared to the previous years due to the shrinking of economic activities at the global level (Dechow *et.al*, 2010).

Figure VI Co-occurrence in the post-GFC Era



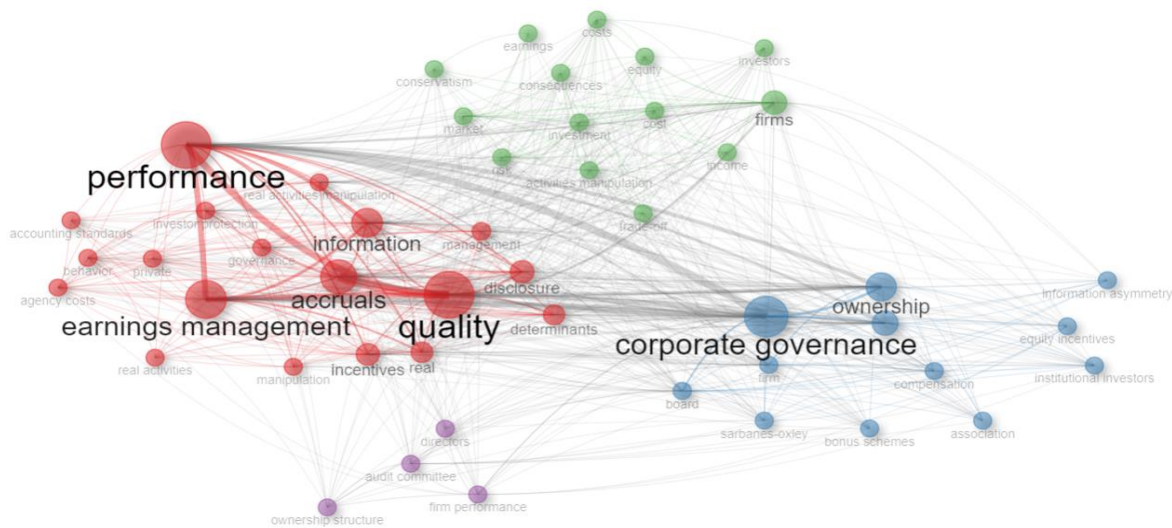
Source: VOSviewer

During the post-GFC era, the research on EM focused on various concepts such as earnings quality, audit quality, and disclosure quality which was necessary to recoup the market momentum at the global level. Thus, following the GFC, IFRS was accepted and implemented at the international level (Even though the International Financial Reporting Standards (IFRS) was introduced in 2003) to enhance the disclosure quality of financial statements. However, few studies have come up with evidence that the presence of income smoothing is more among IFRS-adopting firms (Rudra & Bhattacharjee, 2012), and the various provisions in IFRS such as a provision in income recognition and provision for depreciation expenses have created more opportunities for managerial discretions (Callao & Jarne, 2010). Nevertheless, it was evident that the presence of high-quality auditors has mitigated the EM practices as well as reduced the cost of equity (Chen *et.al*, 2011). However, the presence of high-quality auditors was not enough to recapture the confidence of investors. Due to the purposeful intervention of insiders in the reported figures, potential investors started to rely more on third-party grading mechanisms such as credit rating (Demirtas & Cornaggia, 2013) and IPO grading (Maheswari & Agrawal, 2015) to ensure the quality of company fundamentals. It is evident from the literature that, the presence of reputed credit rating agencies has mitigated the earnings management practices (Ahn & Choi, 2009). Previous evidence also suggests managerial discretions using real-based transactions were lower among firms with high-graded IPOs (Abraham & Kumar, 2023²). Thus, during the post-GFC era, the research on EM has more thrust on the global adoption of IFRS and the role of third-party grading mechanisms in ensuring the disclosure quality to arrest the effect of the global financial crisis that drained the wealth of potential investors.

Modern Era (2018-2023)

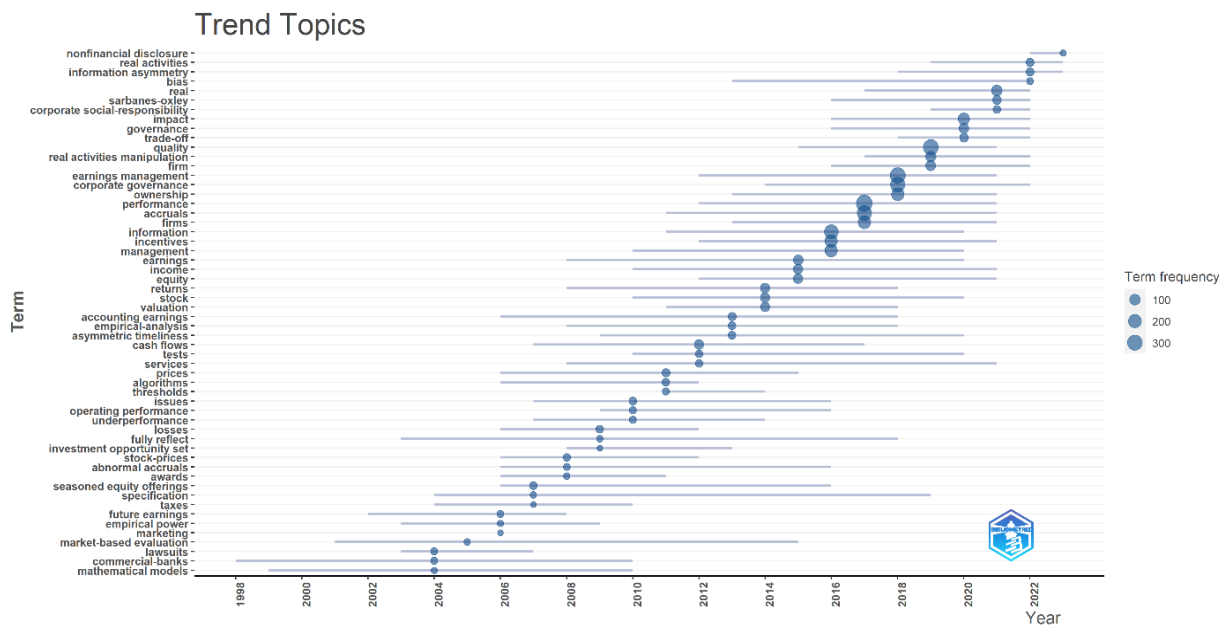
The emergence of the concept of 'socially responsible investing' in EM research has incorporated the psychological and emotional aspects of insiders and investors of a company. Corporate Social Responsibility (CSR) makes a company accountable to itself, its stakeholders, and the general public. Thus, section 135 Companies Act mandates them to spend at least 2% of their average net profit during the three immediately preceding financial years. Companies committed to CSR mechanisms are less prone to managing their earnings using discretionary accruals (Velte, 2020; Almahrog, 2018). It is also evident that EM using real-based transactions is low among socially responsible firms as they won't risk long-term profitability (Gaio, Goncalves & Sousa, 2022). Socially responsible firms with acceptable board composition and optimum gender diversity are more effective in the mitigation of managerial discretionary practices (Orazalin, 2020). Empirical evidence also suggests that female board participation is also effective in constraining EM practices (Mnif & Cherif, 2021). The probability of aggressive EM practices is also lower among companies having larger and independent boards with an audit committee (Saona, Muro & Alvarado, 2020). Likewise, the presence of experienced and qualified women directors on the board and audit committee reduces insider opportunistic behavior (Fan *et.al*, 2019). However, the managers of the companies in the concentrated market with Corporate

Governance (CG) substitute accrual earnings management (AEM) with real earnings management (REM) (Diri, Lambrinoudakis & Alhadab, 2020). Thus, corporate governance in the form of board quality is very effective in mitigating discretionary practices (Chatterjee, 2020).



In the modern era, Ethical considerations and alignment with values have extended corporate governance practices into environmental and social aspects that lead to the incorporation of ESG dimensions in EM research. Nowadays, investors consider the financial materiality and the ESG (Environmental, Governance, and Social) fundamentals while making their investment decisions. Empirical evidence shows that ESG performance reduces AEM, especially governance performance is more effective in mitigating discretionary accruals as compared to environmental and social performance (Velte, 2019). Likewise, firms with higher ESG scores are less prone to manage their earnings using accrual or real-based transactions (Ji *et.al*, 2019). However, financially distressed firms tend to engage in managerial discretion by disclosing more ESG practices using various loopholes such as greenwashing (Almubarak, Chebbi & Ammer, 2023). However, companies that manage their earnings using real transactions will have lower ESG performance and total enterprise value (Habib, 2023). Studies have also addressed the impact of COVID-19 on EM and it was found that firms tend to manage their earnings during the pandemic to meet the analyst coverage (Lassoued & Khanchel, 2021). Thus, in the modern era, research on EM primarily focuses on board diversity, board quality, pandemic effect, and ESG aspects that have bilateral binding on insider policies and public investment decisions.

Figure VIII. Trends in EM Research



Source: Biblioshiny

The research on EM is in its maturity phase and it's still moving to various dimensions like CEO duality, investor sentiments, stock price synchronicity, and so on. Studies can be extended to analyze the Environmental, Social, and governance factors separately (Instead of aggregate ESG) in managerial discretions in emerging markets. Due to enactments and legislations such as IFRS, ESG compliance, IPO grading, and credit rating, we can see that there is a shift from accrual-based discretions to real-based managerial discretions. Therefore, the failure or incapability of these legislations and enactments in mitigating real-based EM can also be addressed in future studies. Also, the magnitude and timing of non-financial disclosures can affect the managerial discretions that can also be analyzed in the future. Research on EM has to be widened to emerging markets, especially towards the role of foreign ownership in managerial discretions are to be considered as such economies acknowledge immense amounts of money in the form of FDI, FPI, foreign bonds, and so on. It is also evident from Figure 8 that the research on EM can be extended to the least explored dimensions such as bias in reporting and non-financial disclosure.

The entire study is limited to 6 keywords. It does not consider other keywords such as big bath, earnings smoothing, tunneling, earnings manipulation, and cookie jar reserves that also resemble managerial discretions. While extracting data from Web of Science and Scopus, we have considered only the published articles published in the English language. Results would have been modified if we considered the book chapters, conference proceedings, and articles in other languages.

Conclusion, Suggestions, Implications, and Limitations

The present study systematizes the literature on EM that will benefit policymakers and academicians to deepen their knowledge and analyze the changes in managerial discretions over time. Till 2010, The majority of studies on EM were mainly confined to the USA and other developed countries due to their professionalism in research and data availability. However, after the Global financial crisis, there has been a boom in EM research in emerging economies such as China, India, South Korea, and so on. The tremendous increase in the number of articles since 2008 shows the interest and relevance of the area among researchers and academicians. The study contributes to the existing literature by segregating the research on EM based on the SOX act, the Global financial crisis, IFRS, Corporate governance, and ESG enactments which are considered to be the game-changers in the managerial discretions over the period. Over time, research on earnings management has taken numerous dimensions such as insider motives and incentives, board characteristics, firm valuation & performance, ownership control & transparency, and so on. Also, more than 90% of the research on EM is interpreted based on two theories such as agency theory (insider opportunism) and signaling theory (outsider

informativeness). The entire study is limited to 6 keywords. It does not consider other keywords such as big bath, earnings smoothing, tunneling, earnings manipulation, and cookie jar reserves that also resemble managerial discretions. While extracting data from Web of Science and Scopus, we have considered only the published articles published in the English language. Results would have been modified if we considered the book chapters, conference proceedings, and articles in other languages.

Conflict of Interest

On behalf of all authors, the corresponding author states that there is no financial or non-financial conflict of interest.

Reference:

- Abraham, M. (2024).** Shariah compliance and Earnings management: Insights on reporting Transparency and Financial Stability, *UCJC Business and Society Review (formerly known as Universia Business Review)*, 21(81). Available at: <https://journals.ucjc.edu/ubr/article/view/4715> (Accessed: October 13, 2024).
- Abraham, M. and Kumar S, S., (2023).** Does discretionary earnings management more common among Indian companies around their IPOs?. *Macroeconomics and Finance in Emerging Market Economies*, pp.1-20.
- Abraham, M., & Kumar, S. S. (2023).** Decoding the decades of earnings management. *National Journal of Commerce and Management (NJCM) Peer-Reviewed/Refereed Journal*, 10(02). ISSN 2394-6342 (online).
- Achleitner, A.K., Günther, N., Kaserer, C. and Siciliano, G., (2014).** Real earnings management and accrual-based earnings management in family firms. *European Accounting Review*, 23(3), pp.431-461.
- Ahn, S. and Choi, W., (2009).** The role of bank monitoring in corporate governance: Evidence from borrowers' earnings management behavior. *Journal of banking & finance*, 33(2), pp.425-434.
- Ali, A. and Zhang, W., (2015).** CEO tenure and earnings management. *Journal of accounting and economics*, 59(1), pp.60-79.
- Aljifri, K., (2007).** Measurement and Motivations of Earnings Management: A Critical Perspective. *Journal of Accounting, Business & Management*, 14.
- Alhadab, M., Clacher, I. and Keasey, K., (2015).** Real and accrual earnings management and IPO failure risk. *Accounting and Business research*, 45(1), pp.55-92.
- Almahrog, Y., Ali Aribi, Z. and Arun, T., (2018).** Earnings management and corporate social responsibility: UK evidence. *Journal of Financial Reporting and Accounting*, 16(2), pp.311-332.
- Almubarak, W.I., Chebbi, K. and Ammer, M.A., (2023).** Unveiling the connection among ESG, earnings management, and financial distress: Insights from an emerging market. *Sustainability*, 15(16), p.12348.
- Aqabna, S.M., Aga, M. and Jabari, H.N., (2023).** Firm performance, corporate social responsibility and the impact of earnings management during COVID-19: evidence from MENA region. *Sustainability*, 15(2), p.1485.
- Baker, H.K., Kumar, S. and Pandey, N., (2020).** A bibliometric analysis of managerial finance: a retrospective. *Managerial Finance*, 46(11), pp.1495-1517.
- Baker, T.A., Lopez, T.J., Reitenga, A.L. and Ruch, G.W., (2019).** The influence of CEO and CFO power on accruals and real earnings management. *Review of Quantitative Finance and Accounting*, 52, pp.325-345.
- Barth, M.E. and Landsman, W.R., (2018).** Using fair value earnings to assess firm value. *Accounting horizons*, 32(4), pp.49-58.
- Beneish, M.D., (1997).** Detecting GAAP violation: Implications for assessing earnings management among firms with extreme financial performance. *Journal of accounting and public policy*, 16(3), pp.271-309.
- Burgstahler, D.C., Hail, L. and Leuz, C., (2006).** The importance of reporting incentives: Earnings management in European private and public firms. *The accounting review*, 81(5), pp.983-1016.
- Burgstahler, D. and Dichev, I., (1997).** Earnings management to avoid earnings decreases and losses. *Journal of accounting and economics*, 24(1), pp.99-126.
- Callao, S. and Jarne, J.I., (2010).** Have IFRS affected earnings management in the European Union?. *Accounting in Europe*, 7(2), pp.159-189.
- Carney, M., (2005).** Corporate governance and competitive advantage in family-controlled firms. *Entrepreneurship theory and practice*, 29(3), pp.249-265.
- Cohen, D.A., Dey, A. and Lys, T.Z., (2008).** Real and accrual-based earnings management in the pre-and post-Sarbanes-Oxley periods. *The accounting review*, 83(3), pp.757-787.
- Coller, M. and Yohn, T.L., (1997).** Management forecasts and information asymmetry: An examination of bid-ask spreads. *Journal of accounting research*, 35(2), pp.181-191.

Cook, K.A., Huston, G.R. and Omer, T.C., (2008). Earnings management through effective tax rates: The effects of tax planning investment and the Sarbanes-Oxley Act of 2002. *Contemporary Accounting Research*, 25(2).

Chan, K.C., Farrell, B. and Lee, P., (2008). Earnings management of firms reporting material internal control weaknesses under Section 404 of the Sarbanes-Oxley Act. *Auditing: A Journal of Practice & Theory*, 27(2), pp.161-179.

Chaney, P.K. and Lewis, C.M., (1998). Income smoothing and underperformance in initial public offerings. *Journal of Corporate Finance*, 4(1), pp.1-29.

Chatterjee, C., 2020. Board quality and earnings management: Evidence from India. *Global Business Review*, 21(5), pp.1302-1324.

Chen, K.Y., Elder, R.J. and Hung, S., (2010). The investment opportunity set and earnings management: Evidence from the role of controlling shareholders. *Corporate Governance: An International Review*, 18(3), pp.193-211.

Chen, H., Chen, J.Z., Lobo, G.J. and Wang, Y.,(2011). Effects of audit quality on earnings management and cost of equity capital: Evidence from China. *Contemporary accounting research*, 28(3), pp.892-925.

Chen, X., Cheng, Q. and Wang, X., (2015). Does increased board independence reduce earnings management? Evidence from recent regulatory reforms. *Review of Accounting Studies*, 20, pp.899-933.

Cheng, Q., Lee, J. and Shevlin, T., (2016). Internal governance and real earnings management. *The accounting review*, 91(4), pp.1051-1085.

Cheng, Q. and Warfield, T.D., (2005). Equity incentives and earnings management. *The accounting review*, 80(2), pp.441-476.

Chih, H.L., Shen, C.H. and Kang, F.C., (2008). Corporate social responsibility, investor protection, and earnings management: Some international evidence. *Journal of business ethics*, 79, pp.179-198.

Chung, R., Firth, M. and Kim, J.B., (2002). Institutional monitoring and opportunistic earnings management. *Journal of corporate finance*, 8(1), pp.29-48.

DeAngelo, L.E., (1986). Accounting numbers as market valuation substitutes: A study of management buyouts of public stockholders. *Accounting review*, pp.400-420.

Dechow, P., (1995). Detecting Earnings Management. *Harvard Business School*.

Dechow, P.M. and Skinner, D.J., (2000). Earnings management: Reconciling the views of accounting academics, practitioners, and regulators. *Accounting horizons*, 14(2), pp.235-250.

Dechow, P., Ge, W. and Schrand, C., (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of accounting and economics*, 50(2-3), pp.344-401.

Defond, M.L. and Jiambalvo, J., (1993). Factors related to auditor-client disagreements over income-increasing accounting methods. *Contemporary Accounting Research*, 9(2), pp.415-431.

Degeorge, F., Patel, J. and Zeckhauser, R., (1999). Earnings management to exceed thresholds. *The journal of business*, 72(1), pp.1-33.

Demirtas, K.O. and Cornaggia, K.R., (2013). Initial credit ratings and earnings management. *Review of Financial Economics*, 22(4), pp.135-145.

DHU, H. and HBP, C., (2019). Corporate governance and earnings management. *Iconic Research and Engineering Journals*, 2(12), pp.212-214.

Dichev, I.D., Graham, J.R., Harvey, C.R. and Rajgopal, S., (2013). Earnings quality: Evidence from the field. *Journal of accounting and economics*, 56(2-3), pp.1-33.

DuCharme, L.L., Malatesta, P.H. and Sefcik, S.E., (2001). Earnings management: IPO valuation and subsequent performance. *Journal of Accounting, Auditing & Finance*, 16(4), pp.369-396.

DuCharme, L.L., Malatesta, P.H. and Sefcik, S.E., (2004). Earnings management, stock issues, and shareholder lawsuits. *Journal of financial economics*, 71(1), pp.27-49.

- El Diri, M., Lambrinoudakis, C. and Alhadab, M., (2020).** Corporate governance and earnings management in concentrated markets. *Journal of Business Research*, 108, pp.291-306.
- Fan, Y., Jiang, Y., Zhang, X. and Zhou, Y., (2019).** Women on boards and bank earnings management: From zero to hero. *Journal of Banking & Finance*, 107, p.105607.
- Ferentinou, A.C. and Anagnostopoulou, S.C.,(2016).** Accrual-based and real earnings management before and after IFRS adoption: The case of Greece. *Journal of Applied Accounting Research*, 17(1), pp.2-23.
- Filip, A. and Raffournier, B., (2014).** Financial crisis and earnings management: The European evidence. *The International Journal of Accounting*, 49(4), pp.455-478.
- Gaio, C., Goncalves, T. and Sousa, M.V., (2022).** Does corporate social responsibility mitigate earnings management?. *Management Decision*, 60(11), pp.2972-2989.
- Glänzel, W., (2015).** Bibliometrics-aided retrieval: where information retrieval meets scientometrics. *Scientometrics*, 102(3), pp.2215-2222.
- Gopalan, R. and Jayaraman, S., (2012).** Private control benefits and earnings management: Evidence from insider controlled firms. *Journal of Accounting Research*, 50(1), pp.117-157.
- Guenther, D.A., (1994).** Earnings management in response to corporate tax rate changes: Evidence from the 1986 Tax Reform Act. *Accounting review*, pp.230-243.
- Guidry, F., Leone, A.J. and Rock, S., (1999).** Earnings-based bonus plans and earnings management by business-unit managers. *Journal of accounting and economics*, 26(1-3), pp.113-142.
- Gunny, K.A., (2005).** *What are the consequences of real earnings management?*. University of California, Berkeley.
- Gunny, K.A., (2010).** The relation between earnings management using real activities manipulation and future performance: Evidence from meeting earnings benchmarks. *Contemporary accounting research*, 27(3), pp.855-888.
- Habib, A.M., (2023).** Does real earnings management affect a firm's environmental, social, and governance (ESG), financial performance, and total value? A moderated mediation analysis. *Environment, Development and Sustainability*, pp.1-30.
- Hasnan, S., Rahman, R.A. and Mahenthiran, S., (2013).** Management motive, weak governance, earnings management, and fraudulent financial reporting: Malaysian evidence. *Journal of International Accounting Research*, 12(1), pp.1-27.
- Healy, P.M., (1985).** The effect of bonus schemes on accounting decisions. *Journal of accounting and economics*, 7(1-3), pp.85-107.
- Healy, P.M. and Wahlen, J.M., (1999).** A review of the earnings management literature and its implications for standard setting. *Accounting horizons*, 13(4), pp.365-383.
- Hussain, A., Akbar, M., Khan, M.K., Sokolová, M. and Akbar, A., (2022).** The interplay of leverage, financing constraints and real earnings management: A panel data approach. *Risks*, 10(6), p.110.
- Ji, S.H., OH, H.M., YOON, K.C. and AN, S.B., (2019).** A study on earnings management in companies achieving sustainability: Accruals-based and real earnings management. *Journal of Distribution Science*, 17(9), pp.103-115.
- Jones, J.J., (1991).** Earnings management during import relief investigations. *Journal of accounting research*, 29(2), pp.193-228.
- Jeanjean, T. and Stolowy, H., (2008).** Do accounting standards matter? An exploratory analysis of earnings management before and after IFRS adoption. *Journal of accounting and public policy*, 27(6), pp.480-494.
- Jennings, R., (1987).** Unsystematic security price movements, management earnings forecasts, and revisions in consensus analyst earnings forecasts. *Journal of Accounting Research*, pp.90-110.
- Klein, C.A. and Hulme, W., (1923).** Expression of Quantity of Water-Soluble Arsenic Present in Commercial Lead Arsenates. *Industrial & Engineering Chemistry*, 15(7), pp.745-746.

- Kothari, S.P., Leone, A.J. and Wasley, C.E., (2005).** Performance matched discretionary accrual measures. *Journal of accounting and economics*, 39(1), pp.163-197.
- Lassoued, N. and Khanchel, I., (2021).** Impact of COVID-19 pandemic on earnings management: An evidence from financial reporting in European firms. *Global Business Review*, p.09721509211053491.
- Leuz, C., Nanda, D. and Wysocki, P.D.,(2003).** Earnings management and investor protection: an international comparison. *Journal of financial economics*, 69(3), pp.505-527.
- Liu, H. and Lee, H.A., (2019).** The effect of corporate social responsibility on earnings management and tax avoidance in Chinese listed companies. *International Journal of Accounting & Information Management*, 27(4), pp.632-652.
- Lo, K., Ramos, F. and Rogo, R., (2017).** Earnings management and annual report readability. *Journal of accounting and Economics*, 63(1), pp.1-25.
- Lombardi Yohn, T., (1998).** Information asymmetry around earnings announcements. *Review of Quantitative Finance and Accounting*, 11, pp.165-182.
- Man, C.K. and Wong, B., (2013).** Corporate governance and earnings management: A survey. *Journal of Applied Business Research*, 29(2), p.391.
- Maheshwari, Y. and Agrawal, K., (2015).** Impact of IPO grading on earnings management. *Journal of Financial Reporting and Accounting*, 13(2), pp.142-158.
- Marquardt, C.A. and Wiedman, C.I., (2004).** How are earnings managed? An examination of specific accruals. *Contemporary Accounting Research*, 21(2), pp.461-491.
- McNichols, M.F., (2000).** Research design issues in earnings management studies. *Journal of accounting and public policy*, 19(4-5), pp.313-345.
- McNichols, M., (1989).** Evidence of informational asymmetries from management earnings forecasts and stock returns. *Accounting Review*, pp.1-27.
- McNichols, M. and Wilson, G.P., (1988).** Evidence of earnings management from the provision for bad debts. *Journal of accounting research*, pp.1-31.
- Mnif, Y. and Cherif, I., (2021).** Female board directorship and earnings management. *Pacific Accounting Review*, 33(1), pp.114-141.
- Myers, J.N., Myers, L.A. and Skinner, D.J.,(2007).** Earnings momentum and earnings management. *Journal of Accounting, Auditing & Finance*, 22(2), pp.249-284.
- Obigbemi, I.F., Omolehinwa, E.O., Mukoro, D.O., Ben-Caleb, E. and Olusanmi, O.A., (2016).** Earnings management and board structure: Evidence from Nigeria. *Sage Open*, 6(3), p.2158244016667992.
- Orazalin, N., (2020).** Board gender diversity, corporate governance, and earnings management: Evidence from an emerging market. *Gender in Management: An International Journal*, 35(1), pp.37-60.
- Persakis, A. and Iatridis, G.E.,(2016).** Audit quality, investor protection and earnings management during the financial crisis of 2008: An international perspective. *Journal of International Financial Markets, Institutions and Money*, 41, pp.73-101.
- Pilkington, A. and Liston-Heyes, C., (1999).** Is production and operations management a discipline? A citation/co-citation study. *International Journal of Operations & Production Management*, 19(1), pp.7-20.
- Pritchard, A., (1969).** Statistical Bibliography; An Interim Bibliography.
- Roychowdhury, S., (2006).** Earnings management through real activities manipulation. *Sloan School of Management, Massachusetts Institute of Technology*.
- Richardson, V.J. and Waagelein, J.F., (2002).** The influence of long-term performance plans on earnings management and firm performance. *Review of Quantitative Finance and Accounting*, 18, pp.161-183.
- Rudra, T. and Bhattacharjee, C.D., (2012).** Does IFRs influence earnings management? Evidence from India. *Journal of Management Research*, 4(1), p.1.

- Saona, P., Muro, L. and Alvarado, M., (2020).** How do the ownership structure and board of directors' features impact earnings management? The Spanish case. *Journal of International Financial Management & Accounting*, 31(1), pp.98-133.
- Schipper, K., (1989).** Commentary on earnings management. *Accounting horizons*, 3(4). Simpson, A., 2013. Does investor sentiment affect earnings management?. *Journal of Business Finance & Accounting*, 40(7-8), pp.869-900.
- Small, H., (1973).** Co-citation in the scientific literature: A new measure of the relationship between two documents. *Journal of the American Society for information Science*, 24(4), pp.265-269.
- Srinidhi, B.I.N., Gul, F.A. and Tsui, J., (2011).** Female directors and earnings quality. *Contemporary accounting research*, 28(5), pp.1610-1644.
- Subramanyam, K.R., (1996).** The pricing of discretionary accruals. *Journal of accounting and economics*, 22(1-3), pp.249-281.
- Sun, J., Lan, G. and Liu, G., (2014).** Independent audit committee characteristics and real earnings management. *Managerial Auditing Journal*, 29(2), pp.153-172.
- Sun, L. and Rath, S., (2010).** Earnings management research: a review of contemporary research methods. *Global Review of accounting and Finance*, 1(1), pp.121-135.
- Teoh, S.H., Welch, I. and Wong, T.J., (1998).** Earnings management and the long-run market performance of initial public offerings. *The journal of finance*, 53(6), pp.1935-1974.
- Teoh, S.H., Welch, I. and Wong, T.J., (1998).** Earnings management and the underperformance of seasoned equity offerings. *Journal of Financial economics*, 50(1), pp.63-99.
- Türegün, N., (2020).** Does financial crisis impact earnings management? Evidence from Turkey. *Journal of Corporate Accounting & Finance*, 31(1), pp.64-71.
- Velte, P., (2020).** Corporate social responsibility and earnings management: A literature review. *Corporate Ownership & Control*, 17(2), pp.8-19.
- Velte, P., (2021).** Environmental performance, carbon performance and earnings management: Empirical evidence for the European capital market. *Corporate Social Responsibility and Environmental Management*, 28(1), pp.42-53.
- Xie, B., Davidson III, W.N. and DaDalt, P.J.,(2003).** Earnings management and corporate governance: the role of the board and the audit committee. *Journal of corporate finance*, 9(3), pp.295-316.
- Xu, R.Z., Taylor, G.K. and Dugan, M.T., (2007).** Review of real earnings management literature. *Journal of Accounting Literature*, 26, p.195.
- Yuan, K., Zeng, D., Yuan, X. and Lan, F., (2022).** Real earnings management, manipulation incentives and accounting conservatism: evidence from China. *Emerging Markets Finance and Trade*, 58(4), pp.939-951.
- Zang, A.Y., (2012).** Evidence on the trade-off between real activities manipulation and accrual-based earnings management. *The accounting review*, 87(2), pp.675-703.
- Zéghal, D., Chtourou, S. and Sellami, Y.M., (2011).** An analysis of the effect of mandatory adoption of IAS/IFRS on earnings management. *Journal of international accounting, auditing and taxation*, 20(2), pp.61-72.

Transforming Learning for Sustainable Progress: University of Technology Mauritius's Post-COVID Educational Strategy

Havisha Vaghjee

Senior Lecturer

University of Technology Mauritius

Abstract

The World Health Organisation (WHO) stated that education was one of the social areas most affected by the COVID-19 pandemic, posing unprecedented challenges in the field. The pandemic brought to light disparities and shortcomings in educational institutions, such as lack of resources, supportive environments, and availability to ICT for distance learning. These issues delayed the global adoption of the Sustainable Development Goals (SDG4) and Environmentally Sustainable Development (ESD). This study aimed to assess the effects of the pandemic on education, particularly SDG4 and ESD, the presence of ESD in University of Technology Mauritius (UTM) programs and courses, analyse the challenges preventing effective implementation, and recommend best practices to achieve better results. Research indicates that universities are playing a vital role in driving technological advancements throughout the Fourth Industrial Revolution. This is mostly due to the integration of intelligent technologies such as Artificial Intelligence (AI), 5G, Web 3.0, the Internet of Things, cybersecurity, and e-commerce. A survey was conducted among UTM students to measure sustainability across courses, and 352 responses were recorded for 60 courses. The study found that ESD is implemented broadly across different courses but does not imply a causal relationship with individual courses of study. A focus group was conducted to gather data on challenges in implementing ESD at UTM and possible solutions. Positive responses were gathered across the four schools of UTM, and interviewees discussed the purpose of ESD in courses, relevancy to curriculum and pedagogy, how ESD can guide students, strengthen partnerships, and promote innovation in the teaching-learning conceptual framework. Survey results indicated that students are open to incorporating Education for Sustainable Development (ESD) into their academic programmes in order to educate themselves about sustainability concerns and develop the skills necessary to contribute to a more sustainable future.

Keywords: Education for Sustainable Development, Sustainable Development, Sustainable Development Goals, COVID-19, Higher Education

Introduction

The COVID-19 pandemic severely impacted the education sector, leading to university closure and a significant loss of face-to-face education for over a year. Concerns were raised for students enrolled in various university programs, leading to the implementation of online classes so as to limit the virus's spread. Mauritius' education institutions faced flaws despite its efforts to meet the Sustainable Development Goals (SDGs) and provide quality education. The crisis has sparked interest in the role of Education for Sustainable Development (ESD) in fostering a more ecologically and symbiotic society. Rapid adjustments were made to teaching and learning experiences to ensure students are not penalised. Lecturers had to ensure online learning continuity and adapt to new pedagogical concepts. Students had to rely on their resources to continue studying remotely via the Internet. The role of education in a post-COVID-19 context is urgent for universities to cope effectively and sustainably (Evans et al., 2019). Students need more than theoretical and practical knowledge to acquire social competencies, creative thinking, and communication skills. Universities must reflect on the barriers and challenges encountered, such as a lack of financial and human resources and a shortage of skilled employees. By reviewing the curriculum, lecturers can better address fundamental problems and find solutions to new teaching methods.

Problem Statement

COVID-19 has significantly impacted the progress made towards Agenda 2030 and the Sustainable Development Goals (SDGs), particularly in the context of Education for Sustainable Development (ESD) (Taylor et al., 2020). Instructors had to shift to online learning, many of whom were not trained in using digital tools and platforms, and exams were cancelled or postponed, affecting the overall delivery of sustainability-related information (Finlayson et al., 2021). This crisis exposed limitations in ESD management worldwide, as almost all education institutions found themselves unprepared to deal with it. The focus has since then been to overcome these challenges and returning students to learning in the "new normal." UNESCO (2022) notes that while the pandemic has caused disruption in educational systems worldwide, it also offers opportunities for change and reshape for better resilience. As Dovletmurzaeva et al. (2021) concur, ESD is designed to help the global community find constructive solutions to present and future challenges, increasing the resilience and vitality of

societies. Investment in remote learning should mitigate the immediate disruption caused by COVID-19 and establish approaches to develop more open and flexible education systems for the future. University programs must be inclusive to ensure that the UN Development Goals are met. To successfully implement ESD, it is essential to evaluate students' learning process, teaching, and delivery modes. This research aimed to review the contributions of University of Technology Mauritius (UTM) programmes toward the promotion of sustainable development and identify challenges arising from new teaching and blended learning methods. It is crucial to understand the connection between sustainability from a learner's perspective and train students to analyse socio-environmental conflicts and find alternatives to participate in individual and collective decision-making in society.

Aim and Objectives

The aim of the project was to determine the extent to which UTM programs on offer are supporting the promotion and sustainment of education for sustainable development and the current challenges that arise from a blended learning teaching mode.

The specific objectives of this study were

- To probe into the need and urgency to ensure the incorporation of sustainable developments goals and practices within programs of studies that are on offer
- To analyse the current UTM education model and to demonstrate how with challenges like the COVID-19 pandemic university teaching on sustainability is more than necessary.
- To assess programmes and courses relevant to sustainable development and determine how successfully teaching and learning objectives are being met.
- To determine the current challenges that UTM is facing while dispensing education for sustainable development.
- To recommend on the best practices to foster and maintain successful education for sustainable development.

Literature Review

Definition of Sustainable Development

Sustainable Development (SD) has begun as a visionary development model for different sectors of society that ensures a better quality of life for everyone and future generations. According to the World Commission on Environment and Development, “The Brundtland Commission of 1987” has defined sustainable development as: “Any development that meets the needs of the present without compromising the ability of the future generations to meet their own needs” (United Nations General Assembly, 1987, p. 43).

The Brundtland Commission Report is divided into three major sections: (i) shared concerns, (ii) common challenges, and (iii) common endeavours. Each of these sections requires working on the economic, social and environmental dimensions to maintain the entire life ecosystem (Spangenberg et al., 2002). Under this approach, many institutions target to balance these three long-term objectives. It needs to be pointed out that studies have added a fourth dimension of SD, which is the governance dimension (Stojanovic et al., 2016). They have shown that governance plays a vital role through which power is exercised to implement actions and policies for SD and that there is a mutual interaction between the other three dimensions. Other studies have also included the technological dimension (Penzenstadler and Femmer et al., 2013) and the cultural dimension (Brocchi, 2010). The SD concept is often graphically presented in a Venn diagram where the different pillars intersect and are as follows:



Figure 1: The difference pillars of sustainable development (Source: Venngage, 2022)

The combination of the different pillars of SD remains a challenge for many countries, and they should at least reach these expectations put forward. Education is a fundamental tool in practical implementation. Every person must have the learning opportunities to understand SD and align it with their everyday practices to facilitate ESD. With such a thorough understanding, students would be better equipped to make sustainable decisions while also being mindful of themselves and others. In brief, it prepares vast transmissive knowledge for the present and future generations.

The Sustainable Development Goals

The Agenda for Sustainable Development 2030 is a global framework with 17 interconnected goals, 169 targets, and 232 indicators aimed at reducing poverty, protecting the environment, providing quality education, reducing inequalities, and promoting peace, prosperity, and economic growth by 2030.



Figure 2: The 17 Sustainable Development Goals (SDGs) (Population Matters, 2020)

The Sustainable Development Goals (SDGs) are a global partnership aiming to achieve sustainable development by 2030. These goals define priorities and efforts for global sustainable development. 194 countries signed up for this framework face a challenge in delivering these SDGs and maintaining community engagement, connection, and empowerment. They must play a fundamental societal transformation. In other words, achieving the SDGs means that countries must understand where they are and where they are headed to “emerge stronger from the crisis and prepare for unknown challenges ahead, funding statistical development must be a priority for national governments and the international community” (The Sustainable Development Goals Report, 2022, p. 3).

SDG Goal 4: Quality Education

This research, based on SD principles, will focus on SDG 4 as a key pillar to address social, economic, environmental, and governmental challenges, emphasizing the need for students to become sustainability actors and rethinking pedagogy to address these complex issues. The fourth of the 17 Sustainable Development Goals (SDGs) is high-quality education, with its vision to “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” (United Nations, 2022, p. 1). Quality education promotes socio-economic mobility, poverty eradication, and human capabilities development, thereby addressing global issues like climate change and biodiversity.

SDG Target 4.7

SDG Target 4.7 is one of the key targets that address Education for Sustainable Development (ESD) and Global Citizenship. ESD may be referred to as “a critical mechanism for moving towards a more sustainable future” (Adams et al., 2020) because it has been included in Agenda 2030 since 2015 as a Sustainable Development Goal (SDG 4.7). In short, ESD is a crucial facilitator of the SDGs and accomplishes its goals by transforming society. Moreover, it is necessary to highlight where SDG progress has and has not been made. With the COVID-19 pandemic, more efforts have been put into healthcare, and in the case of education, digitalisation has gained a more upper hand in preventing learning losses. Similarly, inequalities and injustices in developed, developing, and less developed countries have increased awareness.

The Three Means of Implementing SDG Target 4.7 are:

- Effective learning environment - Building education facilities in a non-violent, inclusive, safe, and effective learning environment for learners.

- Scholarships - To expand the number of scholarships available to developing and least developed countries for enrolment in higher education, including vocational training, engineering and scientific programmes, and information and communications technology.
- Teachers and Educators - To increase the supply of qualified educators and offer them training if required in developing and least developed countries.

The Importance of Quality Education for Universities

Quality education is crucial for achieving the 17 SDGs by 2030 and is increasingly recognized as essential in the context of sustainable development, especially in light of challenges like climate change and the COVID-19 pandemic. Universities play a crucial part for all stakeholders, and the significance of this sector for the SDGs is emphasised in several studies (Torres, 2021). Quality education fosters critical thinking skills and community engagement, while encouraging open dialogue and active participation. Universities can act as catalysts for sustainability and support the 2030 Agenda by fostering a shift towards sustainability and encouraging individuals to bring new incentives towards sustainability.

Considering the broader reach to attain the 2030 Agenda, UNESCO (2022, p. 13) has stated that universities should contribute to these three interrelated themes:

- “The need to move towards inter- and transdisciplinary modes of producing and circulating knowledge.”
- “The imperative of becoming open institutions, fostering epistemic dialogue and integrating diverse ways of knowing.”
- “The demand for a stronger presence in society through proactive engagement and partnering with other societal actors.”

Leal Filho et al. (2021) recognise that universities are developing initiatives to reach the SDGs. Universities alone cannot transform communities; they require the cooperation and support of other institutions and organizations working together towards these goals. Siegel and Bastos (2020) assert that the Sustainable Development Goals (SDGs) hold immense potential for fostering inclusive and revolutionary transformation. Universities are implementing teaching and learning practices that significantly impact students' lives. As UNESCO (2022, p. 13) puts it, “It is also time for universities to make sustainability and SDGs core requisites for all faculty members. Sustainability education should connect students with real-world problems and immersive experiences.”

A. Definition of Education for Sustainable Development (ESD)

According to UNESCO (2019, p. 1), Education for Sustainable Development (ESD) is a source of empowerment for learners “to make informed decisions and responsible actions for environmental integrity, economic viability, and a just society, for present and future generations, while respecting cultural diversity. It is about lifelong learning, and is an integral part of quality education. ESD is holistic and transformational education which addresses learning content and outcomes, pedagogy and the learning environment. It achieves its purpose by transforming society.”

The Berlin Declaration on Education for Sustainable Development (UNESCO, 2022, p. 3) has declared that ESD should “promote intercultural understanding, cultural diversity, a culture of peace and non-violence, inclusion and the notion of responsibility and active global citizenship”. ESD is a continuous process that guides individuals to have positive changes. It includes knowledge, skills, values, attitudes, competencies, and critical thinking changes. For instance, there are challenges in individuals’ daily activities, and ESD helps them reflect upon their current activities. ESD aspires to empower present and future generations to satisfy their needs or requirements by using an integrated approach to sustainable development’s economic, social, and environmental elements (Leicht et al., 2018). ESD is a promising approach if youth participation is collective in society. By 2030, ESD must ensure that “all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and culture’s contribution to sustainable development” (UNESCO, 2022, p. 1).

Furthermore, ESD for 2030 calls for more critical thinking and reflective actions (Kopnina, 2020). Individuals require values, attitudes, creativity, skills, and social abilities to make decisions for local and global challenges. ESD prepares youth for job markets, community participation, and improving their lives by supporting learners across all academic disciplines to balance economic, social, and environmental factors. Universities face challenges in implementing post-COVID reality, shifting from traditional teaching and learning to a post-COVID reality, and navigating the new focus on education structures and practices remains challenging. The ongoing discourse on Sustainable Development Goals (SDGs) and ESD widens the gap between formal and informal education, prompting discussions on sustainable education systems, particularly in the post-COVID-19 era, amidst the rise of AI, digitalization, and climate crisis.

Universities are urged to rethink their education model and examine their role in society. According to Ottersen (2019), universities contribute to the Sustainable Development Goals (SDGs) through teaching, research, and participation in external leadership, culture, and organizational governance. The goal is to equip students with critical thinking, collaborative decision-making, and responsibility for present and future generations. Universities should also serve as forums for debating ideas, research, and innovation, as they have academic freedom to convene different sectors of society. Sustainability challenges are relatively new in developing nations, especially in higher education, and there is a lack of in-depth analysis of programs offered. Sustainability science as a standalone subject is yet to gain acceptance in educational systems, despite specific environmental sciences being included in the agenda. Priyadarshini and Abhilash (2020) found that no courses offered sustainability science, and only half of higher education institutions provided environmental sciences in India.

The Mauritian context faces the challenge of fully integrating ESD principles into teaching programs with limited funding and strong management support. To achieve this, continuous good practices, infrastructure development, stakeholder dialogue, course reorientation, and increased awareness among lecturers and staff are needed. Strengthening cooperation and exchange with other universities is also crucial for incorporating ESD principles in higher education institutions.

B. Education in the Post-COVID 19 era

Today, educational systems are characterised as the 'new normal' where blended learning or hybrid learning has gained importance and is considered a suitable educational strategy to improve the potential of students' learning (Megahed and Ghoneim, 2022). From an academic perspective, blended learning combines the advantages of traditional learning and online teaching (Bokolo, 2021). Higher education institutions are rethinking the purpose of education, pedagogical concepts, and fostering more democratic, sustainable, and just societies as they transition from traditional to blended learning, necessitating innovative curricula and strategies. The post-pandemic era has seen a shift towards digital technologies, with universities playing a crucial role in accelerating technological innovations during the Fourth Industrial Revolution. This includes logistic, technical, digital infrastructure, and pedagogical perspectives, incorporating intelligent technologies like AI, 5G, Web 3.0, IoT, cybersecurity, and e-commerce. Mauritius' educational systems require time to evolve, necessitating efficient lesson planning by lecturers to improve student performance and skills for sustainable transformation (Yang et al., 2022).

Higher education is crucial for students as it serves as the final step before entering professional careers. Universities should emphasize the possibilities, strengths, and challenges of achieving the Sustainable Development Goals (SDGs) and enhance student engagement in learning to become problem solvers. Students should reflect on their values and improve themselves to contribute to a sustainable society. Universities should encourage openness among lecturers, researchers, administrators, and stakeholders to find solutions in teaching practices and curriculum that address ESD concepts. The COVID-19 crisis has complicated ESD, forcing universities worldwide to reassess their educational purpose. A global model of ESD is challenging as each country has its own goals, priorities, plans, and evaluation methods. ESD goes beyond educating on sustainable concepts; many institutions are implementing curriculum innovation to equip students with the necessary competencies and participation in sustainable development. Digital skills are considered one of four areas that will help students thrive in their future work. Universities must view themselves as learning sites, incorporating new content into courses and training for students.

Academics in various faculties are reorienting their curriculum towards sustainability, with some universities implementing green campus events and programs to address sustainability challenges. To achieve the Sustainable Development Goals (SDGs), lecturers must encourage their departments to make instructional content relevant to the current situation. They should also encourage students to consider the linkages between the post-COVID-19 era and the curriculum. However, universities must continue to reflect on post-COVID-19 context, teaching socio-emotional learning opportunities and re-considering education objectives through ESD.

There are skills and infrastructural gaps in universities, and it is crucial for lecturers to help learners and bridge traditional learning gaps. Issues such as educational inequalities and online teaching methods are significant challenges. Some universities are investing in developing positive attitudes, critical thinking, dialogue, and problem-solving skills. A more in-depth research is needed to determine the best education or pedagogical model for long-term support for learners and staff. This holistic approach should increase students' knowledge and reflective thinking while providing a comprehensive system for ESD development.

C. UTM as a Case Study

The University of Technology Mauritius (UTM) aims to enhance students' lives through teaching, knowledge and skills development, research, and innovation. It offers undergraduate and post-graduate academic programs, equipping local and international students with diverse skills to contribute to key Mauritian industries and

participate in regional and international activities. UTM aims to enhance collaboration among students, staff, and stakeholders by addressing social, environmental, and economic issues. In the post-COVID-19 'new normal', it is crucial to empower learners and staff to integrate the Sustainable Development Goals (SDGs) for common solutions. UTM is adapting to existing learning and pedagogy, using different resources, changing curriculums, and building capacity to create a better world. Higher Education Institutions play a crucial role in achieving the Sustainable Development Goals (SDGs) by providing research, technological innovation, and solutions through university management and public and private partnerships. They promote sustainable growth considering social, environmental, and economic factors. Universities deliver knowledge, competencies, values, skills, and critical thinking to students and academic staff, helping them keep pace and achieve the SDGs. Students are expected to become tomorrow's leaders and apply their professional and social skills competencies to reach ESD goals (Weiss et al., 2021). Universities develop students to effectively engage in sharing learning approaches with society.

Universities should promote sustainability through their programs, curriculum, and extra-curricular activities, encouraging students to create their own opinions and cope with sustainability concerns (Leal Filho et al., 2019). They should recognize the organization's needs in a sustainable manner, considering economic, social, and ecological factors. Universities should interact with stakeholders to identify areas where Environmental, Social, and Governance (ESG) has not been applied. Institutional support should be provided to integrate ESG into curricula. Investing in resources and having high academics who make the most of these resources are critical for creating a culture of sustainability (Rosati and Faria, 2019). ESG should be integrated into the institutional framework through vision and mission in campus operations, education and research, and assessment and reporting by staff, students, employers, and administration.

Implementing the blended learning approach in lockdown and post-lockdown period at UTM

The University of Technology Mauritius (UTM) has implemented the Blended Learning Unit (BLU) to enhance its education and research services during the COVID-19 pandemic and post-lockdown. The BLU uses blended learning materials like WhatsApp Group, Google Meet, Zoom Meeting, emails, Facebook, and LinkedIn for coherent communication. Blended learning is considered a viable alternative for gradual change due to its efficiency and effectiveness during the pandemic (Lapitan et al., 2021). UTM is implementing a "learning by doing" approach to foster cooperation among staff, administration, stakeholders, and students. To prevent COVID-19 contamination, they have implemented a "Bring Your Own Device-BYOD" policy, allowing students without necessary facilities to seek support from the Student Affairs Office for funding and resource access.

The research investigates the implementation of ESG in the University and its impact on achieving the UN SDGs. ESG aims to develop critical thinking, innovative problem-solving, empathy, and problem-solving skills among students, while also promoting awareness of the need for change agents to achieve a sustainable future. The University of Technology Mauritius (UTM) has emphasized sustainability in its four schools, adopting a holistic approach that aligns with the Sustainable Development Goals (SDGs). UTM acknowledges the interconnectedness of social, economic, and environmental dimensions and incorporates Environmental Sustainability (ESG) principles in various programmes. These programs involve staff and students discussing local issues, promoting learner-centered and participatory societal approaches. UTM also organizes co-curricular activities, such as student clubs, field trips, internships, workshops, and debates, to facilitate learning opportunities and develop students' creative and professional competencies for sustainable actions.

Higher education institutions are recognizing the need for further research to tackle sustainability implementation challenges, particularly in terms of student-perceived service quality. Achieving SDG 4 requires enhancing student satisfaction. Chen et al. (2022) conducted a study on factors affecting student satisfaction through surveys. This approach could help identify factors affecting students' performance and satisfaction with learning delivery modes, which are often the focus of addressing education's complex challenges. This research highlights the challenges faced by academics, students, researchers, and staff in finding solutions to barriers in the literature. To adapt to new priorities in a post-COVID-19 context, it is necessary to investigate these issues using various materials and methods to support UTM's learning approaches using different materials and methods.

Methodology

This research aimed to assess sustainable development programs and courses, determine teaching and learning objectives, and identify challenges faced by UTM in dispensing sustainable development education. A mixed methodology was used, providing comprehensive, rich information and enabling flexible collection of existing data. However, mixed methods are often labor and resource-intensive and require collaboration with third parties, making them challenging to implement effectively.

The project utilized two methodologies for its analysis. The first involved adapting a sustainability questionnaire from the EDINSOST project, aiming to enhance sustainable development in universities and equip future graduates with the skills to implement change. The questionnaire revealed the strengths and weaknesses of ESG

curricula, enabling decision-makers to propose solutions for more effective implementation. The second method involved a focus group discussion to gather ideas on the challenges faced by school members in implementing ESD and discuss possible recommendations. Twelve members from four schools participated, sharing their views on the challenges faced by UTM in delivering sustainable development education.

Data Collection

The EDINSOST questionnaire, originally designed for engineering students at the Barcelona School of Informatics, was modified to assess digital competences in sustainability in ICT engineering degrees in Spain (Urrea-Solano et al., 2021). The final instrument consisted of three socio-demographic questions and 15 Likert type questions with a scale range of Strongly disagree – 0, Disagree – 1, Agree – 2, and Strongly agree – 3. Confidentiality and voluntary participation were ensured throughout the process. An online Google Form was created and sent to all UTM students, recording responses from May 9th to June 6th, 2023. Google Form offers benefits such as reduced paper use, unlimited response recording, and free and automatic data storage (Mondal et al., 2018). This study focuses on UTM students from four schools: SBMF, SSDT, SHS, and SITE.

Sample Size

The UTM student population consists of 3579 students from all schools and levels of study. To obtain a comprehensive view of the study, the Cochran Formula is used to calculate the sample size, accuracy level, margin of error, and confidence level. This method is crucial for obtaining comprehensive survey information and ensuring a comprehensive understanding of the study.

The Cochran Formula is:

$$n_0 = \frac{Z^2 pq}{e^2}$$

e Margin of error
p Population proportion
z Use Z Table

Where:

n_0 is the sample size

e stands for margin or error, or the desired level of precision is 5% (i.e. $e=0.05$)

p is the estimated proportion of the population (i.e. $p=0.5$)

q is $1-p$

the value of z is in the statistical tables, which contain the area under the normal curve, that is, $Z=1.96$ for a 95% level of confidence

$$n = ((1.96)^2 (0.5) (1-0.5)) / (0.05)^2 = 348$$

The study has a sample size of 348 students, including those who participated in pilot testing. The non-response value is oversampled to 350. The Cochran Formula is applied to consider the population structure of students at UTM, with the sampling methodology considering SITE, SBMF, SSDT, and SHS schools. The total sample size for this research is 350.

C. Focus Group Discussion

The study conducted a focus group discussion at UTM to gather staff opinions on ESD challenges. The principal investigator moderated the discussions, while the research assistant took notes. UTM's blended learning approach made online group discussions suitable for interviewees' availability time, as the study aimed to understand participants' experiences and knowledge of the topic. The study targets UTM faculty members from four schools, SBMF, SSDT, SHS, and SITE, with an ideal focus group size of 8-10 subjects, a moderator, and a note taker, as per Krueger and Casey (2009).

Questions of interest are listed in table below:

Research questions	Barriers	Dimensions of quality education
1. Does ESD improve educational purposes and outcomes?	Purpose	Effectiveness
2. How can ESD help to improve and enrich school curriculum development?	Curriculum and pedagogy	Effectiveness
3. How can ESD guide students to have the knowledge, skills and value to care for and solve the sustainable development issues that will arise in the future?	Students	Equity, relevance and sustainability
4. How can ESD help strengthen the partnerships between schools and other stakeholders including the surrounding community?	Community	Efficiency
5. How can ESD promote innovation in the teaching-learning conceptual framework?	Teachers	Reflexivity and responsiveness

ESD's Effectiveness in UTM Courses and Programmes

Results from the current study show that in general, the questionnaire was reliable in capturing information on ESD in courses that UTM offers. As a whole, learners at UTM have a good knowledge of the interrelations between the environment, social and economic spheres as they pertain to sustainability. Students at the University of Technology (UTM) understand the impact of their everyday choices on the environment and how to mitigate them. However, they are less active in community activities promoting sustainable development, possibly due to limited post-COVID activities. Despite their understanding of sustainable development and ethical principles, students from diploma to graduate levels are not actively engaged in promoting sustainable practices. This suggests that while students are well-prepared to address future issues, they are not actively participating in community processes aimed at making society more sustainable. The data from Shapiro-Wilk's test shows a normal distribution except for questions 10 and 11 about reducing environmental and societal impacts, such as using public transportation or participating in local projects. This uneven distribution may be due to respondents agreeing strongly with the questions and students disagreeing, causing the data to shift towards the positive. The Pearson's Correlation Analysis revealed weak relationships between courses and student responses, with most being moderately to very weak. The overall r value of 0.419 suggests a moderately strong positive correlation between the variables, indicating a weak correlation between the variables. The study found a strong correlation between students' knowledge of reducing negative impacts of their actions, their understanding of the relationships between society, economy, and the natural environment, their ability to implement actions that reduce their impact on the environment and society, and their choice of projects that manage resources in a better way. While sustainability is present in UTM courses, it does not necessarily indicate a causal relationship with individual courses of study.

Challenges UTM Face in Implementing ESD and Possible Recommendations

The main barriers to implementing ESD in universities include a lack of understanding and misconceptions about sustainable development, discipline-oriented program structures, procrastination, fear of extra work, lack of awareness on ESD, unwillingness to change current practices, lack of support from the university community, over jammed curricula, and political aspects within the university community (Disterheft et al., 2013; Leal Filho, 2011; Lozano, 2006; Dahle and Neumayer, 2001; Leal Filho, 2000). The study highlights the importance of identifying the purpose of Environmental Education and Design (ESD) within institutions for effective implementation. Interviewees agree that ESD improves educational outcomes by training students to address sustainability issues like climate change. It also enriches curriculum development by providing a theoretical framework, promoting awareness of the importance of a sustainable world among children of all ages. The implementation of Education for Sustainable Development (ESD) can be complex, especially in areas like programming. To address the global post-COVID challenges, it is suggested that introducing ESD-related subjects as electives or restructuring the entire curriculum could help remove barriers. ESD can guide students to develop knowledge, skills, and values to address future sustainable development issues. Increased ESD awareness among students can prepare them to become future ambassadors of sustainable development, focusing on developing competencies, reflection power, and problem-solving skills. Cultivating a mentality of ESD among students is crucial as all industries are now geared towards sustainability, such as hotels, which require

sustainability certifications. This approach is essential for fostering a sense of community relevance and promoting sustainability in various sectors.

The study suggests promoting a community approach to education by harmonizing curricula, syllabi, and school activities, and encouraging students to participate in community-related projects. This approach can help students understand their expectations and become advocates for sustainable development. ESD can promote innovation in the teaching-learning conceptual framework by enhancing skills and values related to a sustainable world. It allows teaching professionals to incorporate global issues in the curriculum and be flexible in their methods. It is crucial to ensure that both teachers and learners understand ESD. Before implementing a curriculum change, it is essential to train those delivering knowledge in understanding ESD principles and relevance across all subjects and fields. Lozano (2006) suggests overcoming barriers in universities by engaging top-level support, setting goals, providing necessary information, and identifying dedicated individuals to champion ESD.

Conclusion

The COVID-19 pandemic has significantly impacted education, causing millions of children to lose valuable school time and mental wellbeing. This research aimed to analyse the UTM education model and integrate ESD in all areas, measuring its effectiveness across courses and programs. For effective implementation, course conveyors need to be trained in ESD and encouraged to guide students in sustainability practices. ESD in the teaching-learning environment is now a necessity, as leaders and decision-makers are being modelled in the university environment. This study provides groundwork on ESD in UTM's courses, identifies gaps in proper implementation, and offers solutions to overcome these barriers using a methodology that any university or organization can implement.

References

Books & eBooks

Brocchi, D. (2010). ‘The cultural dimension of un/sustainability.’ In Religion and Dangerous Environmental Change: Transdisciplinary Perspectives on the Ethics of Climate and Sustainability, edited by S. Bergmann and D. Gerten, Studies on Religion and the Environment 2: 145-176

Chen, B.L., Liu, Y., and Zheng, J.Q. (2022). Using Data Mining Approach for Student Satisfaction with Teaching Quality in High Vocation Education. *Front. Psychol.* 12, 746558.

UNESCO (2022). Education for sustainable development: Empowerment through knowledge, skills, and values to protect the planet. Available online: Education for sustainable development | UNESCO 71.

Journal Articles

Adams, S., Trisia F., & Holland J. (2020). “Non-Formal Education for Sustainable Development: A Case Study of the ‘Children in the Wilderness’ Eco-Club Programme in the Zambezi Region.” *Journal of Education for Sustainable Development* 14(2): pp. 11739

Bokolo, A.J. (2021). Institutional factors for faculty members’ implementation of blended learning in higher education. *Educ. Train.* 63, 701-719. doi: 10. 1108/ET-06-2020-0179

Kopnina, H. (2020). Education for The Future? Critical Evaluation of Education for Sustainable Development Goals. *J. Environ. Educ.* 51, pp. 280–291.

Lapitan, L.D., Tiangco, C.E., Sumalinog, D.A.G., Sabarillo, N.S., J.M. Diaz, and N.S. (2021). An effective blended online teaching and learning strategy during the COVID-19 pandemic. *Educ. Chem. Eng.*, 35, pp. 116-131, 10.1016/j.ece.2021.01.012

Leal Filho, W., 2000. Dealing with misconceptions on the concept of sustainability. *International journal of sustainability in higher education*, 1(1), pp.9-19. 33.

Leal Filho, W.L., 2011. About the role of universities and their contribution to sustainable development. *Higher Education Policy*, 24, pp.427-438.

Leal Filho, W., Shiel, C., Paço, A., Mifsud, M., Avila, L.V., Brandli, L.L, Molthan-Hill, P., Pace, P., Azeiteiro, U.M., Vargas, and V.R., Caeiro, S. (2019). Sustainable development goals and sustainability teaching at universities: falling behind or getting ahead of the pack? *J Clean Prod* 232:285–294. <https://doi.org/10.1016/j.jclepro.2019.05.309>

Leicht, A., Heiss, J. and Byun, W.J. (2018). Introduction. In: Leicht, A., Heiss, J. and Byun, W.J. (eds.) *Issues and Trends in Education for Sustainable Development: Education on the move*. UNESCO. UNESCO Publishing. pp. 7-16.

Lozano, R., 2006. Incorporation and institutionalization of SD into universities: breaking through barriers to change. *Journal of Cleaner Production*, 14(9-11), pp.787-796. 39.

Lozano, R., Lozano, F.J., Mulder, K., Huisingh, D. and Waas, T., 2013. Advancing higher education for sustainable development: international insights and critical reflections. *Journal of Cleaner Production*, 48, pp.3-9.

Megahed, N., and Ghoneim, E. (2022). Blended learning: the new normal for post-COVID-19 pedagogy. *Int. J. Mobile Blended Learn.* 14, 1-15.

Priyadarshini, P., and Abhilash, P.C. (2020). From piecemeal to holistic: introducing sustainability science in Indian Universities to attain UN-Sustainable Development Goals. *J. Clean. Prod.*, 247, p. 119133, 10.1016/j.jclepro.2019.119133

Rosati, F., and Faria, L.G.D. (2019). Addressing the SDGs in sustainability reports: The relationship with institutional factors. *J. Clean. Prod.*, 215, pp. 1312-1326

Stojanović, I., Ateljević, J., and Stević, R.S. (2016). ‘Good governance as a tool of sustainable development.’ *European Journal of Sustainable Development* 5 (4): 558-558.

Taylor, J., Singh, S. and Copsey, O., 2020. Repurposing ESD to Help Adapt to a Post COVID World–Reflections from India and Africa. *Southern African Journal of Environmental Education*, 36.

Weiss, M., Barth, M., and Wehrden, H. (2021). The patterns of curriculum change processes that embed sustainability in higher education institutions. *Sustain. Sci.* 16, 1579-1593. Doi:10.1007/s11625-021-00984-1

Yang, H., Cai, J., and Wang, X. (2022). Examining key factors of beginner’s continuance intention n blended learning in higher education. *J. Comput. High. Educ.* 1-18. Doi: 10.1007/s12528-022-09322-5

Conference Papers & Proceedings

- **Dovletmurzaeva, M.A., Magomadova, T.L. and Barzaeva, M.A., 2021.** Pandemic Impact on Sustainable Education. In *Proceedings of the International Scientific and Practical Conference on Sustainable Development of Regional Infrastructure (ISSDRI 2021) (Vol. 1, pp. 685-689)*
- **Ottersen, O.P. (2019). Modernising Higher Education in the Agenda 2030 era.** In *Proceedings of the Rethinking Higher Education Inspired by the Sustainable Development Goals*, Solna, Sweden.
- **Penzenstadler, B., and H. Femmer. (2013).** ‘A generic model for sustainability with process-and productspecific instances.’ In *GIBSE’13: Proceedings of the 2013 workshop on Green in/by software engineering*, edited by S. Malakuti and C. Bockisch, 3-8. New York: Association for Computing Machinery.

Dynamics of Job Satisfaction And Organizational Citizenship Behaviour: An Analytical Study

Neha Arora

Ph.D Scholar, Arni School of
Business Management &
Commerce
ARNI University, Kathgarh,
Indora, Kangra, Himachal
Pradesh, India

Dr. Jaiman Preet Kaur

Professor, Arni School of
Business Management &
Commerce
ARNI University,
Kathgarh, Indora, Kangra,
Himachal Pradesh, India

Dr. Roopali Sharma

Professor, Amity Institute of
Psychology & Allied Sciences
Amity University, Sector-125,
Noida, Uttar Pradesh, India

Abstract

Background: Enhancing employee engagement, well-being, and corporate success requires an understanding of the relationship between Job Satisfaction and Organizational Citizenship Behavior. This study aims to explore the association between Job Satisfaction and Organizational Citizenship Behavior among Employees of Higher Education Institutions by attempting a correlational research design approach.

Method: Standardized questionnaires, including the Minnesota Satisfaction Questionnaire-Short Form (MSQ-SF) developed by Weiss et al. (1967) and the Organizational Citizenship Behavior scale developed by Podsakoff et al., (1990) were used to collect data from 176 employees of higher education institutions. Data analysis was conducted using SPSS-23, incorporating descriptive and correlation analysis to explore the relationships between the variables of interest.

Result: At the 0.05 level of significance, the results showed a significant low positive correlation between Extrinsic Job Satisfaction and Organizational Citizenship Behavior. However, no significant correlation was found between Intrinsic Job Satisfaction and Organizational Citizenship Behavior. This suggests that employees who are satisfied with extrinsic aspects of their job, such as pay, benefits, and working conditions, are more likely to engage in discretionary behaviors that benefit the organization. In contrast, satisfaction with intrinsic aspects of the job, such as the work itself, achievement, and personal growth, does not appear to have a direct relationship with organizational citizenship behaviors.

Conclusion: This study provides valuable insights into the relationship between Job Satisfaction and Organizational Citizenship Behavior among employees of Higher Education Institutions. The findings of the study emphasize the importance of considering both intrinsic and extrinsic factors in promoting desirable workplace behaviors. The results suggest that fostering employee satisfaction with extrinsic job aspects, such as pay, benefits, and working conditions, may be particularly effective in encouraging discretionary organizational citizenship behaviors. At the same time, attention to intrinsic factors that contribute to job satisfaction, like the work itself, achievement, and personal growth, is also important for nurturing a positive and engaged workforce.

Keywords: Extrinsic Job Satisfaction, Intrinsic Job Satisfaction, Organizational Citizenship Behaviour and Higher Education Institutions

Introduction

Job satisfaction and Organizational Citizenship Behaviour (OCB) have a substantial impact on employee well-being and organizational effectiveness which resulted prompting research. Job Satisfaction relates to an individual's subjective assessment of their job and work environment while Organizational Citizenship Behaviour refers to discretionary endeavors that support organizational goals but are not specifically acknowledged by formal incentive systems. It is essential to understand the association between Job Satisfaction and Organizational Citizenship Behaviour for enhancing employee engagement, productivity, and overall organizational success.

Job Satisfaction: According to *Spector (1997)*, "the extent to which people like or dislike their jobs" is what constitutes job satisfaction. It is believed that job happiness has a major influence on Behaviour linked to the job, such as absenteeism, productivity, and teamwork (*Meyer, 2004*). Job entails communicating with superiors and coworkers, adhering to organizational guidelines, achieving performance targets, putting up with subpar working circumstances, and other similar requirements. Thus, a worker's evaluation of his level of job satisfaction is a complicated combination of numerous distinct factors. The two factors that affect job happiness

are intrinsic and extrinsic. Extrinsic motivators include pay, rewards and advantages of the job, status, and working environment. Recognition, difficult labor, meaningful job, accomplishment, and chances for personal development are examples of intrinsic motivators (Judge et al., 2000).

The term "Organizational Citizenship Behaviour" (OCB) describes the voluntary, non-mandatory contributions made by individuals to the organizations where they work. Research suggests the relationship between job satisfaction and these kinds of contributions is stronger than that between productivity and core job activities (Carrall & Organ, 1988). OCB has been shown to improve worker morale, raise people's perceptions of the significance of their jobs, and improve productivity and performance. Studies reveal that performance is favorably predicted by OCB. It lessens stress and fosters improved social relationships among coworkers. The five characteristics of OCB are civic virtue, sportsmanship, conscientiousness, kindness, and altruism. Educators and practitioners promote OCB. These factors improve workers' desired conduct and productivity in line with managers' and organizations' expectations.

- The term "altruism" describes actions taken out of self-determination to assist others in resolving various work-related issues;
- Conscientiousness is the ability to voluntarily choose to execute work at a higher standard than is necessary, including paying attention to tasks at hand, following rules and regulations, taking time off, and engaging in other job-related behaviours;
- Sportsmanship is the ability of staff members to tolerate a variety of circumstances without voicing their displeasure, such as avoiding gossip, complaints, blaming, and insignificant matters;
- Courtesy is making judgments that avoid relationship problems with others. They must examine how their own acts may affect others, and they must constantly respect the personal rights of others.
- Civic virtue is the act of engaging in a variety of work-related tasks.

Conceptual Framework of the Study:



Source: Researcher

The conceptual framework illustrates the relationship between intrinsic and extrinsic job satisfaction, overall job satisfaction, and organizational citizen satisfaction (OCB). Intrinsic job satisfaction, which comes from internal factors such as personal growth and achievement, and extrinsic job satisfaction, derived from external factors like salary and work conditions, both contribute to an employee's overall job satisfaction. This job satisfaction, in turn, has a direct impact on organizational citizenship behavior, which refers to voluntary actions by employees that contribute positively to the organization, beyond their formal job requirements. The framework highlights how satisfaction at both personal and external levels can drive employees to engage in behaviors that benefit their workplace.

However, despite of existing research in academic context, there remains a research gap, particularly within the research done on Employees of Higher Education Institutions, which demands a deeper understanding of the underlying mechanisms and contextual factors influencing these constructs.

Rationale of the Study

In the current educational environment, it is recognized that pressure has been placed on higher education sector teachers due to the industry's ongoing expansion (Brennan & Shah, 2000). Additionally, this additional pressure prevents teachers from providing high-quality instruction and hinders their ability to be satisfied in their jobs. Industry-level factors include the institute's quality assurance system, policy formulation, and institute support (Henard et al., 2010). Additionally, on a personal level, factors like job satisfaction, OCB, and an atmosphere

that supports teachers in fulfilling their missions are significant and have the potential to be examined both independently and in combination in a Higher Education Institute. In order to thrive in the contemporary educational environment, higher education institutions must adapt. New policies and tactics for staff productivity and organizational efficacy must be implemented. Teachers' Job Satisfaction and Organizational Citizenship Behaviours are much more crucial because of the influence they have on students' academic advancement and the standard of education. Studies also reveal that, although being acknowledged for their OCB in student-teacher relationships, professors at higher education institutions endure a great deal of stress due to their demanding workloads.

- This study investigates the connection between Job Satisfaction and Organizational Citizenship Behaviour to fill a vacuum in the literature.
- This comprehensive research will give light on the qualities necessary to develop strategies that support teachers and foster an environment that fosters both career and personal fulfillment.
- Indeed, these variables were researched earlier however lack of empirical evidence were found on the population of higher education employees' segment.
- Majority of the researchers were found from western part of Globe. Indian perspective has not been evaluated clearly.

Review of Literature

Interrelatedness of Organizational Commitment, Job Satisfaction and Organizational Citizenship Behaviour
Previous studies have indicated that organizational commitment (OC) and job satisfaction (JS) are mediated by Organizational Citizenship Behaviour. Organizational Citizenship Behaviour is defined as an individual's mental perception in evaluating or perceiving many aspects related to their job responsibilities. According to *Indarti et al.*, (2017); *Devece et al.*, (2016); and *Prasetyo et al.*, (2017) if administrators build their Job Satisfaction and Organization Commitment, then employees will exhibit Organizational Citizenship Behaviour. This connection is characterized by cause and effect. It was determined that Job Satisfaction and Organizational Commitment are variables that operate as moderators or mediators and are influenced by other variables. Thus, research on the two components of Job Satisfaction and Organizational Commitment is necessary to support Organizational Citizenship Behaviour. Good behaviour, also known as organizational citizenship behaviour, is when workers go above and above the call of duty without expecting compensation. Good behaviour encourages others to show kindness to one another and contributes to the efficient operation of the company. Nonetheless, varied perspectives on appropriate behaviour are of importance to educators, academics, and others. According to *Inandi and Buyukozkan* (2013) good behaviour is demonstrated by dedication and effort to complete tasks and by willingly assisting colleagues in completing their assignments to improve the overall effectiveness of organizational performance, rather than with the expectation of rewards or benefits from such behaviours. According to *Rasheed, Jehanzeb, and Rasheed* (2013) cooperative behaviour displayed by staff members outside of their assigned responsibilities is referred to as organizational citizenship Behaviour. Such actions are taken to assist the success and effectiveness of the organization rather than in the hope of receiving rewards or benefits. Researchers interested in the job and career of teachers have recently focused on OCB behaviours (e.g., *Bogler and Somech*, 2004). Teachers that are prepared to go above and beyond the call of duty are crucial to the success of schools (*DiPaola & Tschannen-Moran*, 2001). There are behavioural differences between educational and non-educational environments. According to *DiPaola and Hoy* (2004), schools function as service organizations with teachers who are primarily dedicated to providing the best care possible for their students. Therefore, various employees may have varied OCBs depending on the nature of their working attitudes. *Ackfeldt and Coote* (2005) suggested that organizational commitment and job satisfaction are two components of job attitudes that directly predict OCBs. Furthermore, research conducted in 2012 by *Bowling, Wang, and Li* provided additional evidence in favor of the theory that job attitudes in an organization are primarily influenced by organizational commitment and job satisfaction

Employee Organizational Citizenship Behaviour is heavily influenced by job satisfaction since happy workers are more likely to demonstrate good behaviours including going above and beyond the call of duty and assisting others. *Santoso, Asbary, Siswanto, and Fahmi* (2020) carried out a study to assess the impact of organizational citizenship and job satisfaction on the performance of private school teachers. They concluded that Organizational Citizenship and Job Satisfaction had a positive and significant impact on teacher performance. Furthermore, *Hidayat and Patras* (2022) discovered in another study that organizational trust influences Job Satisfaction, which in turn influences teacher OCB. It has been discovered that organizational trust significantly and favorably influences teacher OCB indirectly. According to a related study, teacher organizational citizenship behaviour is positively and significantly impacted by job satisfaction (*Shofiyyuddin et al.*, 2021). *Rahman et al.* (2014) discovered a positive and substantial correlation between Job Satisfaction and Self-efficacy as well as between Self-efficacy and Organizational Citizenship Behaviour. Another crucial element to

consider while researching organizational contexts is employee job satisfaction. According to a study of literature on motivation, educators today concur that performance reviews at work lead to increased job satisfaction. Thus, in order to optimize job productivity, an organization that benefits from strong business practices must provide its employees with the necessary skills, knowledge, and experience. Employees that are satisfied with their jobs are more likely to give their all and achieve their goals. Conversely, *Jabeen, Friesen, and Ghoudi (2018)* noted that factors that do not support job satisfaction lead to lower productivity, worse quality, increased absenteeism and turnover, as well as an increase in workplace accidents. Positive or negative feelings might be attributed to a person's level of job satisfaction. When someone attains desirable things or hits the intended goal at a specific level, they experience job satisfaction. If the desired objects or targets do not receive any response, then such sensations could diminish. According to *Mathew and Nair (2021)*, attitudes or feelings regarding what one likes or dislikes about one's job, especially when it comes to operational or responsible components of it, are a big part of job satisfaction. *Singh and Loncar (2010)* observed that both intrinsic and extrinsic motivation had an impact on workers' job satisfaction. Extrinsic motivation is formed externally when something influences the perception of the importance of activities, such as receiving incentives, praise, and rewards. In contrast, intrinsic motivation is formed internally in a person who sees the value of a particular activity and performs this activity willingly without any force or requirement from other people. *Paillé, 2011* came to the conclusion that organizational citizenship conducts positively correlated with and was influenced by job satisfaction. Though there has been research conducted in educational environments, there is still a need for a deeper knowledge of the underlying mechanisms and contextual factors influencing these dimensions. This is especially true for research on employees of higher education institutions.

Afolashde et al. (2024) investigated the influence of emotional intelligence, job satisfaction, and reward systems on the job commitment of workers, and they found that emotional intelligence, satisfaction with work, and the Compensation structures have a big influence on how dedicated workers are to their work. *Sarangi, Jena, and Priyadarshi (2024)* explore the mediating role of organizational commitment (OC) and the moderating role of incentives on the impact of organizational citizenship behaviour (OCB) on firm resilience (FR) during the COVID-19 pandemic and researched the pharma industry bearing the highest risk. According to data from contractual workers at two large Indian companies, OCB favorably influences OC, while both have an impact on FR. Moreover, OC partially mediates, while incentives significantly and positively moderate OC on FR, especially for non-loyalists. These results demonstrate that companies must keep an eye on how OC and OCB affect FR in order to apply the right incentives to increase contract workers' "loyalty." *Sukirman et al. (2024)* studied the impact of managers' professional commitment and organizational commitment on job satisfaction. The findings of the study show that project managers' professional commitment is partly related to their job satisfaction within the project organization. *Wijaya et al. (2024)* conducted research and study showed that job satisfaction is positively correlated with organizational commitment variables. A positive relationship indicates that workers who are outsourced will be more devoted to the organization they work for if they are happier in their roles.

An empirical study by *Khahan Na-Nan et al. (2021)* found that through employee engagement, organizational commitment, and work satisfaction, self-efficacy indirectly influenced organizational citizenship behaviour with statistical significance. There was statistical significance in the partial mediation between self-efficacy and organizational citizenship behaviour by employee engagement, organizational commitment, and job satisfaction. The study's findings demonstrated the mediating roles that job happiness, organizational commitment, and employee engagement play in the spread of good corporate citizenship. As a result, these mediators play a crucial role in providing an appropriate explanation of organizational citizenship behaviour. *Ying et al. (2016)* conducted a study to look into the connection between secondary school teachers' organizational citizenship activity and job attitudes and outcomes demonstrated a statistically significant and favorable link between organizational citizenship behaviour, job satisfaction, and organizational commitment.

According to *Golbasi et al. (2008)*, job satisfaction is the consequence of an individual's evaluation of their work performance, office atmosphere, and work life. It is an emotional response and behavioural manifestation to a job. Kim (2006) asserted that workers with higher job satisfaction levels will also have higher levels of OCB. Additionally, *Podsakoff, MacKenzie, Moorman, and Fetter (1990)* found conflicting data in their research of sales agents about the relationship between extra-role behaviours and job attitudes. Less clear-cut is the literature evidence from educational settings.

Methodology

Aim:

The study aims to explore the relationship between Job Satisfaction and Organizational Citizenship Behaviour among employees of Higher Educational Institutions.

Objectives:

1. To study the relationship between Intrinsic Job Satisfaction and Organizational Citizenship Behaviour among employees of Higher Education Institutions.
2. To study the relationship between Extrinsic Job Satisfaction and Organizational Citizenship Behaviour among employees of Higher Education Institutions.

Hypotheses:

- H1: There will be a significant relationship between Intrinsic Job Satisfaction and Organizational Citizenship Behaviour among employees of Higher Education Institutions.
- H2: There will be a significant relationship between Extrinsic Job Satisfaction and Organizational Citizenship Behaviour among employees of Higher Education Institutions.

Variables:

- Independent Variable: Job Satisfaction
- Dependent Variable: Organizational Citizenship Behaviour

Sample

The samples were 176 Employees (Males & Females) working in Higher Education Institutions of Delhi/NCR Region within the age range from 25 years to 60 years. Demographic data, such as age, gender, occupation, qualification, domicile, area of residence, working experience, association with the organization and contact details, were also collected. The purposive sampling was used by the researcher to gather the information from the participants.

Tools used

The standardized tool Minnesota Satisfaction Questionnaire-Short Form (MSQ-SF) developed by *David J. Weiss* and his colleagues in 1967 consists of 20 items and were utilized to measure Job Satisfaction. It comprises two subscales: Intrinsic Satisfaction and Extrinsic Satisfaction. The reliability of the MSQ-SF for both subscales was found to be, for intrinsic reliability at 0.84 and extrinsic reliability at 0.77. The validity of the MSQ-SF has been established through its construct validity when compared with the long form of the questionnaire. The Organizational Citizenship Behaviour (OCB) scale developed by Podsakoff et al. (1990) consists of 24 items and employed to measure the extent of employees' engagement in behaviours that go beyond their prescribed duties. While the reliability of this scale is reported at 0.61, indicating moderate internal consistency, its validity is affirmed with a coefficient of 0.78, ensuring that it effectively measures the intended construct.

Procedure

To fulfil the objectives of the present study, a standardized questionnaire was given to the 176 employees from Higher Education Institutions of Delhi/ NCR Region. The participants were briefed on the purpose of the study, and informed consent was obtained, stating that participation was voluntary and that they could withdraw from the study at any time. Demographic information such as age, gender, occupation, qualification, domicile, area of residence, working experience and contact information were also gathered. They were encouraged to participate and respond honestly to questions.

RESULT

The data was analyzed using SPSS 23. Prior to applying statistical analysis, the normality of the data is checked by Kolmogorov- Smirnov Test as the sample was more than 50. The test values for OCB were $p = 0.2$ which is greater than 0.05 suggesting it is normally distributed whereas the values for both Extrinsic and Intrinsic Job Satisfaction were $p = 0.002$ which is less than 0.05 implying it is not normally distributed. Since one variable is normally distributed while the other is not normally distributed, non-parametric correlations were utilized hence, Spearman's Correlation is applied on the data.

TABLE 1

Descriptive of mean, standard deviation of the variables- Job Satisfaction (Intrinsic Job Satisfaction, Extrinsic Job Satisfaction) and Organizational Citizenship Behaviour of the HEIs Employees

Variable	N	M	SD
Intrinsic JS	176	43.848	.481
Extrinsic JS	176	19.888	.284
OCB	176	59.899	1.038

Table 1 illustrates the mean and standard deviations of the tools of constructs studied. The mean of the dimension Intrinsic Job Satisfaction was computed to be 43.848 while its standard deviation is reported to be .481. The second dimension, Extrinsic Job Satisfaction has a mean of 19.888 and a standard deviation of .284. In

a similar manner, the second variable- Organizational Citizenship Behaviour reported the mean of 59.899 and a standard deviation of 1.038.

Figure 1

Mean Scores of Job Satisfaction and Organizational Citizenship Behaviour

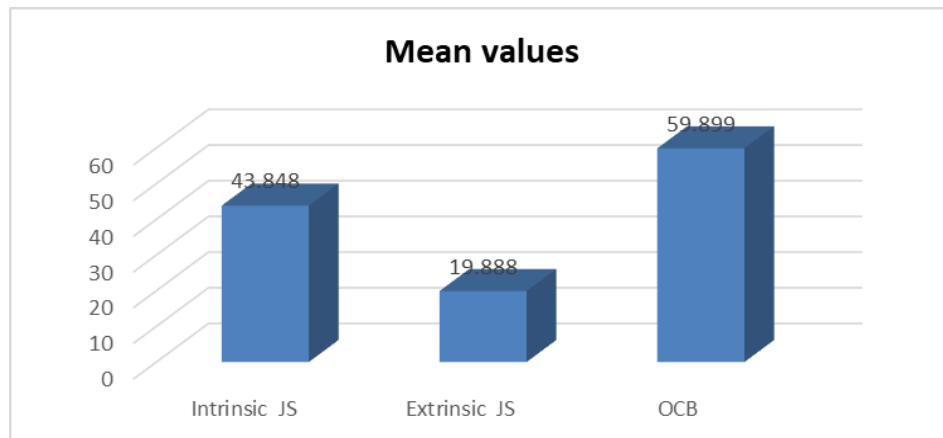


TABLE 2

Correlation between Job Satisfaction (Intrinsic Job Satisfaction, Extrinsic Job Satisfaction) and Organizational Citizenship Behaviour

Variable	1	2	3
1. Intrinsic JS	1		
2. Extrinsic JS	.531**	1	
3. OCB	.105	.152*	1

**Correlation is significant at the 0.01 **. level (2-tailed).

*, Correlation is significant at the 0.05 level (2-tailed).

Table 2 represents the correlations between Job Satisfaction and Organizational Citizenship Behaviour for a sample size of 176 participants. The correlation between Intrinsic Job Satisfaction and Organizational Citizenship Behaviour (OCB) is $\rho = .105$, $p\text{-value} = .161$, since the $p\text{-value} > 0.05$, we fail to retain the hypothesis. Therefore, there is no significant positive relationship between Intrinsic Job Satisfaction and Organizational Citizenship Behaviour (OCB), which suggests that any relationship obtained is simply due to chance factors. The correlation between Extrinsic Job Satisfaction and Organizational Citizenship Behaviour (OCB) is $\rho = .152$, $p\text{-value} = .043$, since the $p\text{-value} < 0.05$, we retain the hypothesis. Therefore, there is a statistically significant low positive correlation between Extrinsic Job Satisfaction and Organizational Citizenship Behaviour (OCB).

Discussion

The present study investigates the relationship between Job Satisfaction (JS) and Organizational Citizenship Behaviour (OCB) among employees of Higher Education Institutions. The sample size of 176 participants, standardized questionnaires including the Minnesota Satisfaction Questionnaire-Short Form (MSQ-SF) (Weiss *et al.*, 1967) and the Organizational Citizenship Behaviour scale (Podsakoff *et al.*, 1990) were administered after obtaining consent. The MSQ-SF measures intrinsic and extrinsic satisfaction, demonstrating reliability and validity. Similarly, the OCB scale assesses employee's engagement in behaviours beyond their prescribed duties, exhibiting moderate internal consistency and high validity. The study aims to explore the association between JS and OCB without implying causality, allowing for an analysis of the relationship's direction and strength within the employees of Higher Education Institutions. The correlational design and purposive sampling technique were employed. The results indicated no significant relationship between Intrinsic Job Satisfaction and Organization Culture Behaviour ($\rho = .105$), whereas a low positive correlation between Extrinsic Job Satisfaction and Organizational Culture Behaviour ($\rho = .152$). The results of our study as well Smith, Johnson, and Brown (2018) have found no significant association between these variables. They examined the relationship between intrinsic JS and OCB and their results revealed a non-significant correlation between intrinsic Job Satisfaction and OCB. The researchers suggested that other factors, such as organizational culture and leadership style, might mediate the relationship between Intrinsic Job Satisfaction and OCB, leading

to the absence of a direct association in their study. This finding highlights the complexity of the relationship between Job Satisfaction and Organizational Citizenship Behaviour and underscores the need for further research to explore additional factors that may influence their interaction. The results imply a statistically significant low positive correlation between Extrinsic Job Satisfaction and Organizational Citizenship Behaviour (OCB). Extrinsically satisfied individuals display a propensity to engage in additional behaviours enhancing the overall organizational environment. The extent to which employees are driven by extrinsic motivators is likely to influence the type of activities they engage in (Nurjanah *et al.*, 2020). Our results are further supported by previous literature including a study conducted by Williams & Anderson (1991) concluded that there is a positive link between Extrinsic Job Satisfaction and Organizational Culture Behaviour, which are OCB efforts directed towards the organization. The positive correlation between Extrinsic Job Satisfaction and OCB was further supported by (Swaminathan & Jawahar, 2013).

Future Recommendations and Suggestions

Future research on the relationship between job satisfaction and organizational citizenship behavior (OCB) could explore the role of mediating factors such as leadership style, workplace culture, and employee engagement. Additionally, examining how job satisfaction influences OCB across different industries and cultural contexts would provide more generalized insights. Lastly, the impact of remote and hybrid work environments on the dynamics of job satisfaction and OCB could be an area of interest, given the evolving nature of work in the digital age. It is also suggested to work on Sample also to either the number or sample with different age groups can be considered, even sample with different positions can also be considered.

Limitations and Future Scopes Of The Study

- The results' generalizability may be limited by the study's small sample size of 176 participants. In order to enhance the generalizability of the results, more personnel from a wider range of higher education institutions—including those from different academic specialties and cultural backgrounds might be included in future studies.
- Longitudinal research may be conducted to track changes over time in Organizational Citizenship Behaviour and Job Satisfaction. This method would shed light on the causal relationship between these variables and how adjustments to the organization or actions might affect them.
- In order to obtain a more comprehensive understanding of the underlying mechanisms and contextual factors impacting the relationship between Job Satisfaction and Organizational Citizenship Behaviour, complement quantitative findings with qualitative research approaches like focus groups or interviews. Implement interventions to improve Job Satisfaction and measure their impact on Organizational Citizenship Behaviour. This could include efforts like leadership training, recognition programs, or better work-life balance regulations.

Addressing these limitations and implementing future suggestions will help researchers gain a better understanding of the relationship between Job Satisfaction and Organizational Citizenship Behaviour among employees of Higher Education Institutions, ultimately informing strategies to promote employee well-being and organizational effectiveness in this context.

Conclusion

This study provides valuable insights into the relationship between Job Satisfaction and Organizational Citizenship Behaviour among employees of Higher Education Institutions. The results indicate that Extrinsic Job Satisfaction, such as satisfaction with pay, benefits, and working conditions, positively correlates with Organizational Citizenship Behaviour. In contrast, no significant positive correlation was found between Intrinsic Job Satisfaction, which includes satisfaction with the work itself, achievement, and personal growth, and Organizational Citizenship Behaviour. These findings highlight the significance of considering both intrinsic and extrinsic factors when fostering positive workplace behaviours.

These observations suggest that a holistic strategy, which strikes a balance between extrinsic and intrinsic motivators, may be effective in increasing overall employee happiness and engagement. Higher education establishments should prioritize enhancing external benefits and job conditions while concurrently implementing tactics to foster intrinsic contentment within their workforce. By promoting a culture of organizational citizenship that supports both corporate performance and individual work satisfaction, these institutions can unlock the full potential of their employees and drive sustainable success.

Notwithstanding, the limitations of the study, such as the restricted sample size and dependence on self-report measures, underscore the significance of additional research to develop interventions aimed at enhancing extrinsic Job Satisfaction, given its substantial correlation with Organizational Citizenship Behaviour.

References

- Ackfeldt, A. L., & Coote, L. V. (2005).** A Study of Organizational Citizenship Behaviors.
- Afolashade, I. S., et al. (2024).** Emotional intelligence, job satisfaction, reward system, and organizational commitment among workers. *ASEAN Journal of Economic and Economic Education*, 3(1), 45-60.
- Altman, D. G. (1990).** Practical statistics for medical research (2nd ed.). Chapman & Hall/CRC Texts in Statistical Science.
- Bogler, R., & Somech, A. (2004).** Influence of teacher empowerment on teachers' organizational commitment, professional commitment, and organizational citizenship behavior in schools. *Teaching and Teacher Education*, 20, 277-289.
- Bowling, N. A., et al. (2012).** The moderating effect of core self-evaluations on the relationships between job attitudes and organizational citizenship behavior. *Applied Psychology*, 97-113.
- Brennan, J., & Shah, T. (2000).** Managing quality in higher education. Open University Press.
- Currall, S. C., & Organ, D. W. (1988).** Organizational citizenship behavior: The good soldier syndrome. *Administrative Science Quarterly*, 33(2).
- Curtis, E. A., et al. (2016).** Importance and use of correlational research. *Nurse Researcher*, 23(6), 20-25. <https://doi.org/10.7748/nr.2016.e1382>
- Dipaola, M., Tschannen-Moran, M. (2001).** Organizational citizenship behavior in schools and its relationship to school climate. *Journal of School Leadership*, 11(5), 424-447. <https://doi.org/10.1177/105268460101100503>
- Ferreira, A. I., Martinez, L. F., Lamelas, J. P., & Rodrigues, R. I. (2017).** Mediation of job embeddedness and satisfaction in the relationship between task characteristics and turnover: A multilevel study in Portuguese hotels. *International Journal of Contemporary Hospitality Management*, 29, 248-267.
- Ghazzawi, I. (2008).** Job satisfaction antecedents and consequences: A new conceptual framework and research agenda. *The Business Review, Cambridge*, 11(2), 1-10.
- Golbasi, Z., Kelleci, M., & Dogan, S. (2008).** Relationships between coping strategies, individual characteristics, and job satisfaction in a sample of hospital nurses: Cross-sectional questionnaire survey. *International Journal of Nursing Studies*, 45(12), 1800-1806. <https://doi.org/10.1016/J.IJNURSTU.2008.06.009>
- He, J., Zhang, H., & Morrison, A. M. (2019).** The impacts of corporate social responsibility on organization citizenship behavior and task performance in hospitality: A sequential mediation model. *International Journal of Contemporary Hospitality Management*, 31(6), 2582-2598.
- Hénard, F. (2010).** Learning our lesson: Review of quality teaching in higher education. [http://lsiep.iiepunesco.org/cgibin/wwwi32.exe/\[in=epidoc1.in\]/?t2000=028063/\(100\).32](http://lsiep.iiepunesco.org/cgibin/wwwi32.exe/[in=epidoc1.in]/?t2000=028063/(100).32)
- Hidayat, R., & Patras, Y. E. (2022).** The effect of organizational trust and job satisfaction on teachers' organizational citizenship behavior in private senior high schools. *Journal Management Pendidikan Islam*, 6(4), 1049-1063.
- Inandi, Y., & Buyukozkan, A. S. (2013).** The effect of organizational citizenship behaviors of primary school teachers on their burnout. *Educational Sciences: Theory and Practices*, 13(3), 1545-1550.
- Indarti, S., Solimun, N., Fernandes, A. A. R., & Hakim, W. (2017).** The effect of OCB in the relationship between personality, organizational commitment, and job satisfaction on performance. *Journal of Management Development* 36(10), 1283-1293.
- Jabeen, F., Friesen, H. L., & Ghouidi, K. (2018).** Quality of work life of Emirati women and its influence on job satisfaction and turnover intention. *Journal of Organizational Change Management*, 31(2), 352-370.
- Judge, T. A., Bono, J. E., & Locke, E. A. (2000).** Personality and job satisfaction: The mediating role of job characteristics. *Journal of Applied Psychology*, 85(2), 237-249.
- Kim, S. (2006).** Public service motivation and organizational citizenship behavior in Korea. *International Journal of Manpower*, 27, 722-740.

- Konovsky, M. A., & Pugh, S. D. (1994).** Citizenship behavior and social exchange. *Academy of Management Journal*, 37, 656-669.
- Lu, H., Barribal, K. L., Zhang, S., & White, A. E. (2012).** Job satisfaction among hospital nurses revisited: A systematic review. *International Journal of Nursing Studies*, 49(8), 1017-1038.
- Mathew, J., & Nair, S. (2021).** Psychological empowerment and job satisfaction: A meta-analytic review. *Vision*, 26(4), 431-440.
- Na-Nan, K., Kanthong, S., & Joungrakul, J. (2021).** An empirical study on the model of self-efficacy and organizational citizenship behavior transmitted through employee engagement, organizational commitment, and job satisfaction in the Thai automobile parts manufacturing industry. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(170). <https://doi.org/10.3390/joitmc7030170>
- Nurjanah, S., Pebianti, V., & Handaru, W. A. (2020).** The influence of transformational leadership, job satisfaction, and organizational commitments on organizational citizenship behavior (OCB) in the Inspectorate General of the Ministry of Education and Culture. *Cogent Business & Management*, 7(1), 1-12.
- Paillé, P. (2011).** Stressful work, citizenship behavior, and intention to leave the organization in a high turnover environment: Examining the mediating role of job satisfaction. *Journal of Management Research*, 3(1), 1-14.
- Podsakoff, P. M., MacKenzie, S. B., Moorman, R. H., & Fetter, R. (1990).** Transformational leader behaviors and their effects on followers' trust in leader, satisfaction, and organizational citizenship behaviors. *The Leadership Quarterly*, 1(2), 107-142.
- Prasetio, A. P., Yuniarsih, T., & Ahman, E. (2017).** Perceived work-life interface and organizational citizenship behavior: Are job satisfaction and organizational commitment mediates the relations? *International Journal of Human Resource Studies*, 7(2), 122.
- Rahman, U., Sulaiman, W. S. W., Nasir, R., & Omar, F. (2014).** The role of job satisfaction as mediator in the relationship between self-efficacy and organizational citizenship behavior among Indonesian teachers. *International Journal of Business and Social Science*, 5(9), 255-261.
- Rasheed, A., Jehanzeb, K., & Rasheed, M. F. (2013).** An investigation of the antecedents of organizational citizenship behavior: Case of Saudi Arabia. *International Journal of Psychological Studies*, 5(1).
- Rony, Z. T., Wijaya, I. M. S., Nababan, D., Julyanthry, J., Silalahi, M., Ganiem, L. M., Judijanto, L., Herman, H., & Saputra, N. (2024).** Analyzing the impact of human resources competence and work motivation on employee performance: A statistical perspective. *Journal of Statistics Applications & Probability*, 13(2), 787-793.
- Salancik, G. R. (1977).** Commitment and the control of organizational behavior and belief. In B. Staw & G. Salancik (Eds.), *New directions in organizational behavior* (pp. 1-54). St. Clair Press.
- Santoso, P. B., et al. (2020).** The role of job satisfaction and organizational citizenship behavior on performance: Evidence from Indonesian teachers. *International Journal of Social and Management Studies*, 1(1), 22-31.
- Sarangi, S., Jena, A. K., & Priyadarshi, A. (2024).** Interactive effects of organizational commitment and incentives on firm resilience during a global crisis. *International Journal of Disaster Risk Reduction*, 104505.
- Shofiyuddin, M., et al. (2021).** The effect of transformational leadership, job satisfaction, and organizational commitments toward organizational citizenship behavior of Indonesian senior high school teachers. *Ilkogretim Online*, 20(3).
- Singh, P., & Loncar, N. (2010).** Pay satisfaction, job satisfaction, and turnover intent. *Relations Industrielles*, 65(3), 470-490.
- Smith, C. A., Organ, D. W., & Near, J. P. (1983).** Organizational citizenship behavior: Its nature and antecedents. *Journal of Applied Psychology*, 68(4), 653-663.
- Sukirman, E., Muhyi, H. A., Raharja, S. U. J., & Tahir, R. (2024).** Impacts of managers' professional commitment and organizational commitment on job satisfaction. *Review of Integrative Business and Economics Research*, 13(1), 184-202.

- Sun, L., et al. (2020).** The influence of emotional intelligence on job satisfaction and organizational citizenship behavior of nurses. *Journal of Managerial Psychology*, 35(6), 401-413.
- Swaminathan, S., & Jawahar, P. D. (2013).** Job satisfaction as a predictor of organizational citizenship behavior: An empirical study. *Global Journal of Business Research*, 7(1), 71-80.
- Teh, P. L., & Sun, H. (2012).** Knowledge sharing, job attitudes and organizational citizenship behavior. *Industrial Management & Data Systems*, 112(1), 64-82.
- Tepper, B. J. (2000).** Consequences of abusive supervision. *Academy of Management Journal*, 43(2), 178-190.
- Verma, A. (2019).** Relationship of job satisfaction with organizational citizenship behavior: A study of selected higher education institutions in Dehradun. *Our Heritage*, 67(10), 1-5.
- Weiss, D. J., Dawis, R. V., England, B. W., & Lofquist, L. F. (1967).** Manual for the Minnesota satisfaction questionnaire. Minneapolis: Industrial Relations Center, University of Minnesota.
- Williams, L. J., & Anderson, S. E. (1991).** Job satisfaction and organizational commitment as predictors of organizational citizenship and in-role behaviors. *Journal of Management*, 17(3), 601-617.

Systematic Analysis of Online Review Credibility: A Bibliometric Study and Research Trajectory

Serene Anna Sam

Research Scholar, Post Graduate and
Research Department of Commerce,
Nirmala College, Muvattupuzha, Kerala
686661 & Assistant Professor, Department
of Commerce, Mar Thoma College for
Women, Perumbavoor, Kerala, India

Dr. Gireesh Kumar G. S

Principal, Henry Baker College, Melukavu,
India

Abstract

In the contemporary digital landscape, online reviews have become a crucial factor in consumer decision making processes. However, the credibility of these reviews is often under scrutiny due to increasing number of fake reviews, manipulation and bias. The purpose of this study is to comprehensively analyse and synthesize the existing global research literature on online review credibility and thereby identify gaps in knowledge and suggest avenues for future investigations. Drawing from the corpus of Scopus database spanning from 2006 to 2023, this paper used VOS Viewer and Biblioshiny to map the evolution and intellectual structure of this field in terms of publication trends, co-citation analysis and keyword co-occurrence analysis. The study revealed an upsurge in the publication trends in this area, with significant institutional contributions from China and the USA. Emerging research themes including source credibility and fake reviews are gaining attention. This research could guide platforms to develop more robust algorithms to filter and emphasize genuine reviews, thereby improving customer experience. The findings could also benefit customer education initiatives, helping users make better informed decisions.

Keywords: Online Review Credibility, Bibliometric Analysis, eWOM, Online Reviews, Word of Mouth

Introduction

Over the last decade, the Internet has revolutionised consumer behaviour and business practices. Online shopping has gained immense popularity on an international scale. A variety of emerging technologies including the Internet of Things, geolocation capabilities and magnetic chips now allow consumers to access real time information from their mobile phones, including product specifications, consumer reviews and status of their orders, making the process of shopping online seamless and smooth.

The emergence of digital platforms has amplified the significance of customer service, with online reviews, social media and word-of-mouth marketing through internet channels making customer care crucial for business success and reputation management. It has become a general practise for customers to share their post purchase experience over the internet. These are commonly referred to as online reviews. It can be conceptually defined as “any positive or negative statement made by potential, actual, or former customers about a product or company, which is made available to a multitude of people and institutions via the Internet” (Hennig Thureau et al., 2003).

Baek et al. (2015) assert that credibility holds paramount importance in the adoption of electronic word-of-mouth. Consequently, the credibility of online reviews is vital, as consumers often rely on them when making purchase decisions. The development of social media platforms and technological advancements have opened new avenues of research in online review credibility. Scholars have also begun to investigate how viral marketing, network dynamics and social influence shape the legitimacy and spread of online reviews. Furthermore, the academic field is now better equipped to analyse large scale data sets of online reviews more effectively with the advancements in data analytics and machine learning. Considering the significance of credibility in the realm of online reviews and the subsequent impact on purchase decisions, it is logical to conclude that review credibility garners significant attention from both consumers and marketers. Despite the significant importance of review credibility, particularly concerning consumers' purchase decisions, and the growing attention from researchers and practitioners on online reviews, there is currently limited research available on the credibility of eWOM communication overall, and specifically on online reviews and their determinants (Teng et al., 2014).

Through an extensive bibliometric analysis, the study aims to summarize the current situation and development trends of research fields and also provide directions for future research (Baker et al., 2021). There is a notable dearth of studies that examine the credibility of online reviews, particularly employing bibliometric analysis techniques, which is a distinct contribution of this study.

Bibliometrics refers to the application of mathematical and statistical methods to books and other means of communication (Pritchard, 1969). It provides a visual depiction of the overall advancement in scientific research related to the topic being studied (Donthu et al., 2021, Ellegaard & Wallin, 2015).

This paper aims to address the following research objectives:

- To analyze the temporal evolution and growth trajectory of online review credibility research
- To identify the most prolific and influential authors in the field of online review credibility, along with their contributions to the body of knowledge
- To evaluate the leading academic journals that publish research on online review credibility, assessing their influence on the field
- To analyse the institutional distribution and impact of research outputs in the domain
- To identify primary areas of research interest to understand current academic focuses
- To highlight potential themes for future research and to suggest areas that require further innovation

To address the above research objectives, 652 documents from the Scopus database were examined, spanning from 2006 to 2023. Furthermore, Biblioshiny software and VOSviewer software developed by Van Eck, Waltman, Dekker & Berg (2010) was used to conduct a comprehensive and objective analysis of online review credibility by applying the visual elements based on the mapping techniques.

The study is articulated in the following manner. Section 2 provides a comprehensive literature review. Section 3 outlines the research methodology used in the study. A summary of the research findings is presented in Section 4. Future research directions, areas for further exploration and investigation are suggested in Section 5. Section 6 encapsulates the study's conclusions and Section 7 ends with the limitations.

Literature Review

The literature on credibility, particularly in the context of online reviews has evolved significantly over the years, reflecting the increasing importance of this topic in consumer behaviour research. Initial investigations focused on the relative credibility of media involving comparisons between newspapers, radio, TV and internet. (Meyer, 1988; West, 1994). Preliminary studies focussed on establishing the influence of online reviews on consumer attitudes and behaviour. These studies often examined the impact of source credibility, review valence, expertise, and volume on consumer perceptions of trust and purchase intention.

Prior studies have explored the various facets of credibility, particularly in the context of online reviews. Early studies by Hovland & Weiss (1951) and Kelman & Hovland (1953) introduced the concept of source credibility, which has since been adapted to the context of online reviews. Disclosure of reviewer identity enhances the transparency and credibility of online reviews and thereby leads to higher information adoption (Forman et al., 2008). Hussain et al. (2017) explored the relation between source credibility of eWOM, perceived risk, consumer's information adoption mediated by argument quality and information usefulness and found that perceived risk positively influenced the variables of trustworthiness, objectivity and expertness.

Cheung et al. (2009) extended their framework to online reviews, revealing that reviews deemed credible typically originate from sources perceived to have high expertise and reliability. Cheng & Ho (2015) discovered that recipients perceive online reviews written by experts to be more useful and these reviews have greater influence on recipients' purchase intention compared to reviewers without expert knowledge. Reviews written in a style that aligns with readers' expectations are deemed more credible, and this credibility is further enhanced when the reviewer demonstrates expertise (Jensen et al., 2013).

Various studies have explored the concept of argument strength which encompasses the dimensions of accuracy, completeness and timeliness. Accuracy refers to the reliability and correctness of online reviews and represents a major influencing factor (Jamil & Hasnu, 2013; Wang & Strong, 1996). Completeness is the extent to which social media information provides comprehensive and detailed information (Luo et al., 2013). Various scholars have suggested that completeness is an important aspect of argument quality and thus can be assigned to the central route of information processing. (Petty & Cacioppo, 1986; Bhattacharjee & Sanford, 2006). Filieri et al (2018) emphasise that timeliness of a review refers to how recent and up-to-date the information is.

Studies have also identified that the credibility of a review is influenced by its content, including aspects such as writing style, grammar, font, and mechanics. (Hernandez- Ortega, 2018; Ketron, 2017; Huang et al., 2018; Ghose & Ipeirotis, 2010). Mudambi & Schuff (2010) focused on length and depth of reviews as indicators of their quality and trust. While scholars such as Shukla & Mishra (2023) argue that review length have no impact on its credibility, scholars like Eslami et al. (2018) are of the opinion that the most helpful factor in predicting the helpfulness of a consumer review is its length.

Materials and Methods

The bibliometric data used in this study was retrieved from the Scopus database on February 2024. Scopus is one of the most comprehensive repositories for peer-reviewed research in social sciences. All articles published from 2006 to 2023 were collected for the study. This time frame was chosen to capture a comprehensive snapshot of the research landscape while ensuring relevance to contemporary issues and developments. Following the retrieval of the bibliographic data from the Scopus database, a rigorous screening process was implemented to identify eligible publications to be included in the study. Duplicate records were removed to eliminate redundancy and streamline the dataset. Publications deemed irrelevant and outside the scope of the study were excluded.

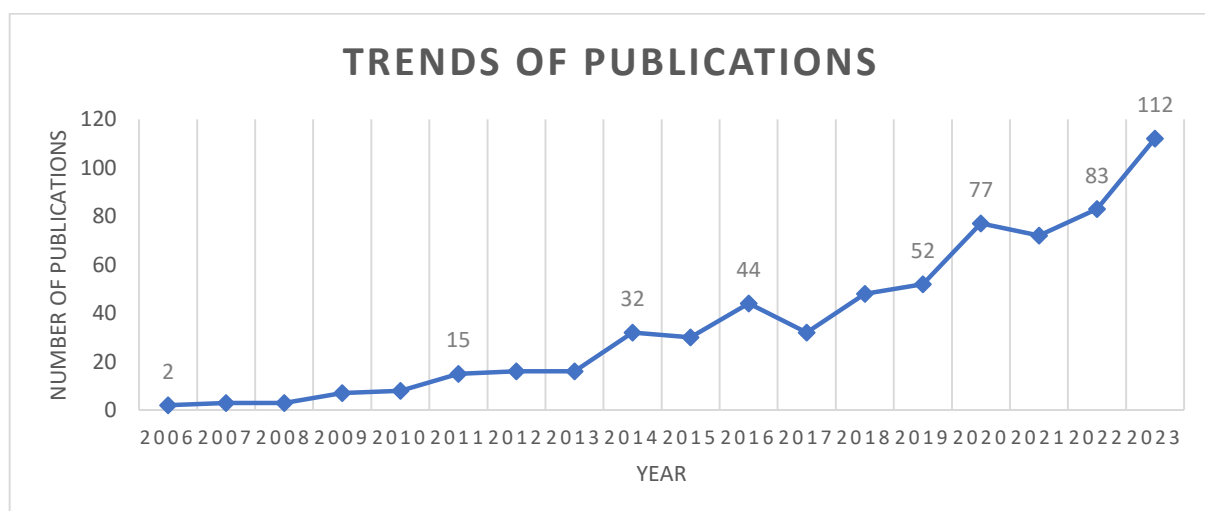
After reading the available literature, the following key words were used for the search: “online reviews”, “electronic word of mouth”, “eWOM”, “online customer reviews”, “product reviews”, “online consumer reviews”, “ratings and reviews”, “online user reviews” and “credibility or credible”. The search scope of the keywords was the title, abstract and keywords of papers. Only articles and conference papers were chosen and the language was set as English. 652 publications were finalised for the study.

Results and Discussion

Publication Trends

Figure 1 presents the outcomes depicting the trends in research publications in the field of online review credibility during the period. The research data indicates a collective count of 652 papers, revealing a consistent surge in the number of publications throughout the years. The pace of publications between 2006 and 2012 was sluggish, reflecting the nascent stage of research in this area and the relatively limited attention afforded to online reviews as a subject of scholarly inquiry. There has been a noticeable increase in the number of publications since 2013. This surge can be attributed to the advancements in information technology and the pervasiveness of social media platforms, which encouraged internet users to engage more in online shopping and e-commerce. Online reviews consequently became an increasingly important component of consumer decision making process. (Brown et al., 2007). As a result, scholars started demonstrating increased interest in researching topics related to online reviews. The outbreak of COVID-19 pandemic in 2020 resulted in a heightened reliance on e-commerce, prompting scholars to intensify their focus on online reviews and their impact. (Gu et al., 2021). As the significance of online reviews escalated, so did concerns regarding their credibility. Consequently, the prevalence of fake reviews has become a prominent subject of discussion in recent years. (Dwivedi et al., 2020). As a result, there has been a notable increase in the number of publications discussing the trust and credibility of online reviews since 2021.

Figure 1 Annual Trend of publications



Top Authors

Table 1 presents the top 10 authors in terms of output and citations in this specific area, each having contributed a minimum of five research papers to this domain. In terms of publication volume, Wang X ranks first with 11 articles, followed by Filieri R contributing 10 articles. Noteworthy contributions have also been made by authors including Lee J (8), Chakraborty U (7) and Chen H (6) to the respective literature. Taking into account the number of citations, Filieri R has the most cited publication with a citation count of 1655 for ten articles, followed by Chen H with a total citation count of 1044.

Table 1 Production by authors

Author	Number of documents	Citations	H-index
Wang X	11	243	8
Filieri R	10	1655	9
Lee J	8	346	5
Chakraborty U	7	303	6
Chen H	6	1044	4
Kim J	6	92	5
Zhang KZK	6	657	6
Zhao SJ	6	657	6
Abedin E	5	23	3
Karunasekera S	5	23	3

Leading Journals and Institutions

A total of 373 sources were examined and 652 documents were gathered finally. In terms of total publications, *Computers in Human Behaviour* and *Journal of Business Research* are the two most productive journals, with 21 and 16 articles respectively. In terms of total citations, *Computers in Human Behaviour* and *Decision Support Systems* demonstrated the highest scholarly impact with 3141 and 1511 citations respectively. In general, there has been a consistent upward trend in the number of articles published by each journal, with a notable increase in growth rate since 2015. This trend aligns with the broader pattern observed across publications. Table 2 presents the list of top ten journals according to their number of publications on online review credibility research.

Table 2 Top ten sources that published online review credibility research

Rank	Sources	Articles	TC	h-index
1	Computers in Human Behaviour	21	3141	17
2	Journal of Business Research	16	1047	8
3	Decision Support Systems	14	1511	11
4	Online Information Review	12	561	9
5	Journal of Retailing and Consumer Services	10	588	7
6	Electronic Commerce Research and Applications	8	289	6
7	International Journal of Hospitality Management	8	590	6
8	Journal of Marketing Communications	8	437	6
9	Journal of Research in Interactive Marketing	8	357	7
10	Electronic Commerce Research	7	330	5

Table 3 presents the most highly cited publications globally on online review credibility research. The study by Cheung et al. in 2009 titled “Credibility of Electronic Word -of -Mouth: Informational and Normative Determinants of online Consumer recommendations” was the most influential publication with highest number of citations (868) followed by that of Djafaroya et al. in 2017, garnering 675 citations. Research articles aiming to provide a comprehensive understanding of eWOM and its influence on consumer decision making are included in the works of Erkan et al. (2016), Zhang et al. (2014) and Cheung et al. (2014). A closer examination of highly cited publications suggests that scholarly investigations into novel social media platforms and online

discussion forums are receiving more attention. (Jin et al.,2014; Filieri et al., 2015; Djafarova et al., 2017). Notable research investigating the factors influencing eWOM credibility were also identified. (Filieri, 2016; Cheung et al., 2012)

Table 3 Top 10 cited articles in terms of total citations

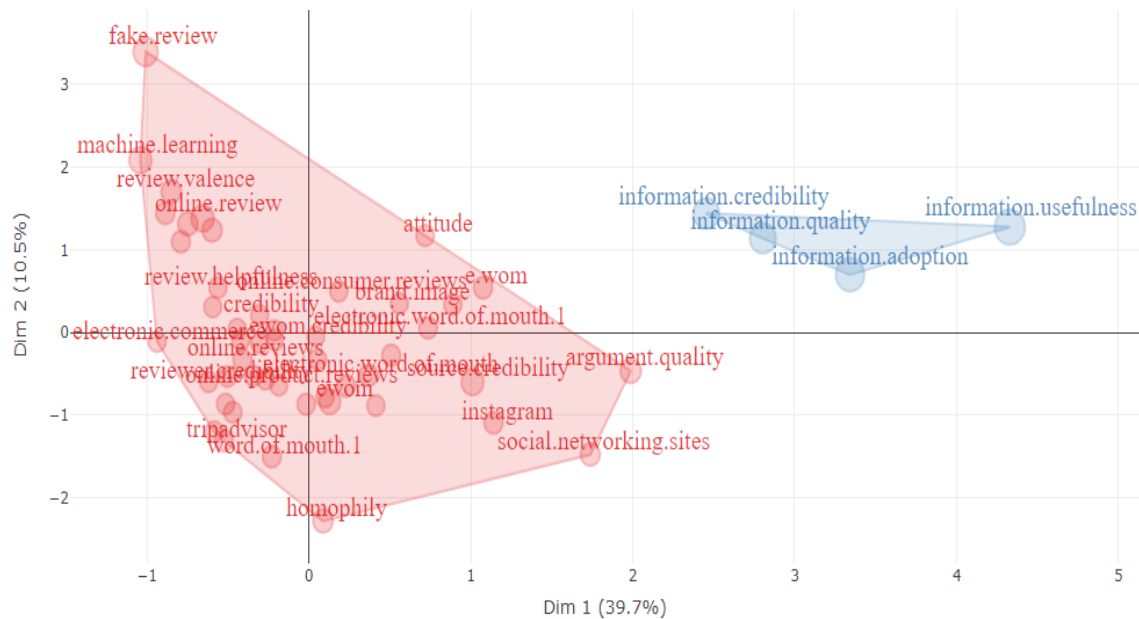
Rank	Publication Title	Authors	Source Title	Citations	Year of Publication
1	Credibility of Electronic Word-of-Mouth: Informational and Normative Determinants of On-line Consumer Recommendations	Cheung, M. Y., Luo, C., Sia, C. L., & Chen, H.	<i>International Journal of Electronic Commerce</i>	868	2009
2	Exploring the credibility of online celebrities' Instagram profiles in influencing the purchase decisions of young female users	Djafarova, E., & Rushworth, C	<i>Computers in Human Behaviour</i>	675	2017
3	The influence of eWOM in social media on consumers' purchase intentions: An extended approach to information adoption.	Erkan, I., & Evans, C.	<i>Computers in human Behaviour</i>	617	2016
4	Why do travelers trust TripAdvisor? Antecedents of trust towards consumer-generated media and its influence on recommendation adoption and word of mouth	Filieri, R., Alguezaui, S., & McLeay, F	<i>Tourism management</i>	526	2015
5	What makes online reviews helpful? A diagnosticity-adoption framework to explain informational and normative influences in e-WOM	Filieri, R	<i>Journal of business research</i>	498	2015
6	Examining the influence of online reviews on consumers' decision-making: A heuristic-systematic model	Zhang, K. Z., Zhao, S. J., Cheung, C. M., & Lee, M. K.	<i>Decision Support Systems</i>	448	2014
7	Following celebrities' tweets about brands: The impact of twitter-based electronic word-of-mouth on consumers' source credibility perception, buying intention, and social identification with celebrities	Jin, S. A. A., & Phua, J.	<i>Journal of advertising</i>	434	2014
8	Online travel reviews as persuasive communication: The effects of content type, source, and certification logos on consumer behavior.	Sparks, B. A., Perkins, H. E., & Buckley, R.	<i>Tourism management</i>	377	2013
9	What makes an online consumer review trustworthy?	Filieri, R.	<i>Annals of Tourism Research</i>	332	2016
10	How consumers evaluate eWOM (electronic word-of-mouth) messages	Doh, S. J., & Hwang, J. S.	<i>Cyberpsychology & behavior</i>	321	2009

A key focus of bibliometric analysis is to identify the most prolific universities or institutions. Table 4 shows that the City University of Hong Kong emerged as the most productive university. School of Management and University of North Texas , Bina Nusantara University and Kyung Hee University followed closely behind. The majority of institutions among the top ten are from China and Malaysia and other Asian countries, depicting the role played by the authors and institutions from these regions.

Conceptual Structure Map Using Factorial Analysis

A conceptual mapping of keywords related to factorial analysis is presented in Figure 3. To present the comprehensive keyword dataset in a condensed manner, the Multi- Correspondence Analysis (MCA) methodology was adopted. Word proximity within the graph structure indicates the similarity with keywords, suggesting the most current areas of study. (Ding et al., 2001). Applying MCA to the Author's Keywords field unveiled two distinct clusters in the resulting factorial network. Each cluster comprises at least 50 terms, features a label size of 10 and are based on a minimum of 5 documents. The cluster in red comprises of keywords relating to documents concentrating on WOM, eWOM, source credibility, and social media. The blue cluster is related to information credibility, credibility, usefulness, quality and adoption.

Figure 3 Conceptual structure map



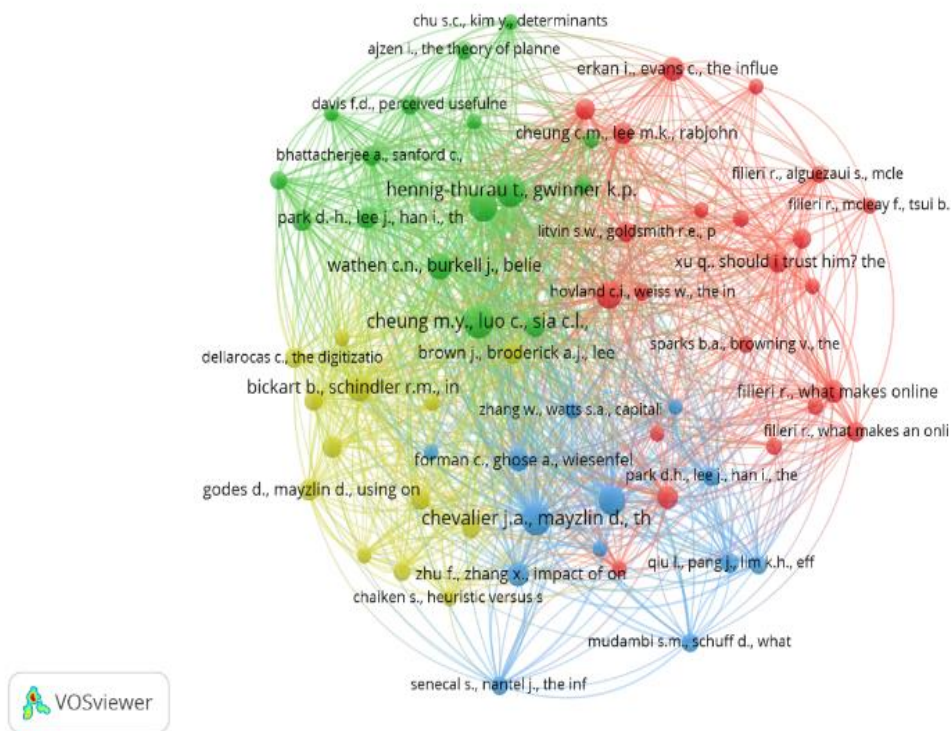
Reference co-citation analysis

Reference co-citation analysis examines the relationships between academic papers based on their co-citation patterns. The strength of this co-citation relationship is typically determined by the number of times the two papers are co-cited by other papers or by the number of authors citing both papers. Higher co-citation counts suggest stronger relationship between the two papers, indicating that they are often cited together in the literature and are likely related in terms of content, topic or methodology.

As presented in Figure 4, the colour of a bubble denotes the cluster to which a reference belongs. The thickness of the line between the two bubbles represents the strength of co-citation relationship between the two papers. The cited references are divided into four clusters. The minimum number of cited references were fixed at 20. Of the 29923 cited references, 64 met the threshold. For each of the 64 cited references, we computed the total strength of the co-citation links with other cited references and selected those references with the highest total link strength.

The red cluster encompasses articles focusing on methodological frameworks and measurement scales for analysing information adoption and credibility. For example, Fornell and Larcker (1981) explored the measurement error of the structural equation model and Ohanian (1990) developed a 15-item semantic differential scale to measure perceived expertise, trustworthiness and attractiveness. The green cluster aggregates studies investigating the factors affecting credibility of eWOM. Chueng et al. (2009) studied the credibility dimensions of eWOM, taking into consideration the informational and normative determinants. The studies included in the blue cluster examine the impact of online reviews on product sales. A study by Chevalier & Mayzlin (2006) discussed the effects of online reviews on sales. The documents in the yellow cluster mainly focus on online communities and internet forums and their influence on consumer behaviour. Bickart & Schindler (2001) investigated whether exposure to online discussions generated greater interest in the product than exposure to marketer generated information.

Figure 4 Reference co-citation analysis network



Author Co-Citation Analysis

Author co-citation analysis in VOSviewer identifies and analyses the relationships between authors based on the co-citation of their works in the academic literature. If two authors are frequently cited together in the same set of documents, it suggests that there is a relationship between their works. Each author is represented as a node and the strength of the relationship between authors is represented by the thickness of the connecting lines between the nodes. Author co-citation analysis also helps in identifying key authors, detecting research trends and also measure the impact of authors within the network.

Authors with at least 20 citations were considered in this analysis. Of the 30728 authors, 724 met the criteria. As presented in Figure 5, there are four primary clusters, among which, red is the largest. Scholars within this cluster primarily investigate topics relating to emerging technologies and behavioural sciences. Lee J, one of the most prominent researchers in this cluster focuses on research areas like data mining and machine learning. The researchers in the green cluster mainly focus on digital ecosystems and information management. Authors such as Dellarocas have published many articles relating to social media, information economics and big data. The researchers in the blue cluster focus on advanced analytical techniques in marketing and consumer research. For example, Filiari R and Hair J have published articles relating to social media, business analytics and technology adoption. Scholars in the yellow cluster pay attention to social media, ecommerce and digital business strategies.

Numerous scholars have extensively studied the credibility of online reviews, yielding significant findings. However, there remains ample room for further exploration and advancement in this field. Building upon the aforementioned research outcomes, this paper offers suggestions for future studies on online review credibility, aiming to inspire future scholars in their research.

One of the primary challenges facing online review platforms is the proliferation of fake reviews and review manipulation tactics aimed at deceiving consumers and influencing purchasing decisions. Researchers have identified numerous types of review fraud such as paid endorsements, incentivised reviews and review spams, highlighting the necessity for effective detection and mitigation strategies. A combination of features such as POS tag frequencies, text-categorisation based features LIWC output etc can be utilised for effective review spam detection (Crawford et al., 2015). Singh et al. (2022) proposed the implementation of a system using Ethereum Blockchain, IPFS and smart contracts to ensure transparent and tamper-proof review platforms. Integration of deep learning and hybrid models have been the interest of scholars recently (Li et al., 2017; Rayana & Akoglu, 2015). Future research can build on these foundations to explore new algorithms and improve already-existing models to further enhance the integrity of online review systems.

The amount of user-generated content on e-commerce platforms, social media, and other online forums has grown exponentially, making human moderation techniques inadequate. AI presents viable answers to these problems. Davidson et al. (2017) developed a robust model for detecting hate speech on social media platforms using a combination of natural language processing (NLP) techniques and machine learning algorithms. Gao et al. (2018) proposed an AI model to identify reviews that were inappropriate or required human intervention. Research by Zhang et al. (2020) proposed a customisable AI moderation framework that allows social media platforms to define specific rules for effective content moderation. Scholars can further delve into the challenges related to accuracy, bias and transparency to fully harness the benefits of AI in this domain.

Trend 3: User behaviour analysis

Behaviour analysis, which examines the patterns and actions of both consumers and reviewers, is often considered as a vital tool to assess the credibility of online reviews. Factors such as review timings and patterns (Jindal & Liu, 2008), user interaction networks (Akoglu et al., 2013) and behavioural footprints (Fei et al., 2013) can be used to identify patterns and anomalies. Future research can focus on behavioural analytics and patterns of user interactions by incorporating more advanced data analytics, machine learning models, and real-time monitoring systems.

Conclusions

The insights gained from this research have several implications for both research and practice in the field of online review credibility.

Research Implications: The study adds to the current body of literature by conducting a thorough review of online review credibility. When compared to the previous literature, this study focuses on the niche aspect of credibility, covering a longer time span (2006-2023) and larger number of publications (652 documents) published in the Scopus database. The gradual rise in publications since 2013 can be assumed to be driven by the growing importance of social media, technological advancements, fraudulent reviews and the broader societal and regulatory ramifications of online review systems. Notably, universities in China and the USA have made significant institutional contributions. Authors, including Wang X, Filieri R, Lee J and Chakraborty U are among the most prominent in the field. The keyword co-occurrence network analysis explains the current state of knowledge about online review credibility. The identification of emerging thematic trends and research clusters provides scholars with valuable insights for future research. Through author co-citation and reference co-citation analysis, the study identified key authors (Lee J, Filieri R, Dellarocas Chrysanthos) and classic papers (Fornell & Larcker, 1981; Cheung et al., 2009; Chevalier & Mayzlin, 2006; Bickart & Schindler, 2001). Understanding the network of collaborations among researchers and institutions can facilitate partnerships, funding, and knowledge sharing. By integrating insights from multiple disciplines and methodologies, scholars can leverage existing knowledge and expertise to address multifaceted research questions and push the boundaries of academic research.

Practical Implications: The insights from the bibliometric analysis offers actionable insights for practitioners and policy makers for enhancing the trustworthiness of online review platforms. By understanding the factors that influence review credibility and consumer behaviour, enterprises and review platforms can implement measures to foster transparency and authenticity in online reviews. Educational institutions can offer training programmes for students and public on how to identify genuine reviews and avoid deceptive ones, ultimately leading to the creation of a transparent online marketplace.

Limitations

It is important to acknowledge the limitations of this study that can be used to guide future research. First, this study has only considered articles published in Scopus database. Future research can integrate multiple databases such as Web of Science to provide a more comprehensive picture. The study could be susceptible to biases owing to the selection of specific keywords and search phrases.

Author's Contribution

This manuscript is the combined effort of the authors. Serene Anna Sam envisioned the idea and extracted the relevant literature. Dr. Gireesh Kumar provided guidance on the initial concept, supervised the entire work and offered crucial inputs. Both the co-authors collaborated on the final presentation and editing of the manuscript.

Conflict of Interest

The authors certify that they have no affiliations with or involvement in any organisation or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript. This research was conducted in the absence of any commercial or business relationships that could be considered as a potential conflict of interest. The opinions expressed in this article are the authors' own and do not reflect the view of any funding organization or institutional affiliation.

Funding Acknowledgement

The authors received no financial support for the research, authorship and/or for the publication of this article.

References

- Akoglu, L., Chandy, R. and Faloutsos, C., (2013).** Opinion Fraud Detection in Online Reviews by Network Effects. *Proceedings of the International AAAI Conference on Web and Social Media*, 7(1), pp.1-10.
- Baek, H., Oh, S. and Ahn, J., (2015).** The effect of electronic word-of-mouth (eWOM) on mobile application downloads: An empirical investigation. *International Journal of Mobile Communications*, 13(2), pp.136-156.
- Baker, H.K., Kumar, S. and Pandey, N., (2021).** Thirty years of the *Global Finance Journal*: A bibliometric analysis. *Global Finance Journal*, 47, p.100492.
- Bhattacharjee, A. and Sanford, C., (2006).** Influence processes for information technology acceptance: An elaboration likelihood model. *MIS Quarterly*, 30(4), pp.805-825.
- Bickart, B. and Schindler, R.M., (2001).** Internet forums as influential sources of consumer information. *Journal of Interactive Marketing*, 15(3), pp.31-40.
- Brown, J., Broderick, A.J. and Lee, N., (2007).** Word of mouth communication within online communities: Conceptualizing the online social network. *Journal of Interactive Marketing*, 21(3), pp.2-20.
- Chakraborty, U., (2019).** Perceived credibility of online hotel reviews and its impact on hotel booking intentions. *International Journal of Contemporary Hospitality Management*, 31(9), pp.3465-3483.
- Cheng, Y.H. and Ho, H.Y., (2015).** Social influence's impact on reader perceptions of online reviews. *Journal of Business Research*, 68(4), pp.883-887.
- Cheung, M.Y., Luo, C., Sia, C.L. and Chen, H., (2009).** Credibility of electronic word-of-mouth: Informational and normative determinants of on-line consumer recommendations. *International Journal of Electronic Commerce*, 13(4), pp.9-38.
- Chevalier, J.A. and Mayzlin, D., (2006).** The effect of word of mouth on sales: Online book reviews. *Journal of Marketing Research*, 43(3), pp.345-354.
- Crawford, M., Khoshgoftaar, T.M., Prusa, J.D., Richter, A.N. and Al Najada, H., (2015).** Survey of review spam detection using machine learning techniques. *Journal of Big Data*, 2, pp.1-24.
- Davidson, T., Warmusley, D., Macy, M. and Weber, I., (2017).** Automated Hate Speech Detection and the Problem of Offensive Language. *Proceedings of the International AAAI Conference on Web and Social Media*, 11(1), pp.1-10.
- Ding, Y., Chowdhury, G.G. and Foo, S., (2001).** Bibliometric cartography of information retrieval research by using co-word analysis. *Information Processing & Management*, 37(6), pp.817-842.
- Donthu, N., Kumar, S., Mukherjee, D., Pandey, N. and Lim, W.M., (2021).** How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, 133, pp.285-296.
- Ellegaard, O. and Wallin, J.A., (2015).** The bibliometric analysis of scholarly production: How great is the impact? *Scientometrics*, 105(3), pp.1809-1831.
- Eslami, S.P., Ghasemaghaei, M. and Hassanein, K., (2018).** Which online reviews do consumers find most helpful? A multi-method investigation. *Decision Support Systems*, 113, pp.32-42.
- Fei, G., Mukherjee, A., Liu, B., Hsu, M., Castellanos, M. and Ghosh, R., (2013).** Exploiting Burstiness in Reviews for Review Spammer Detection. *Proceedings of the International AAAI Conference on Web and Social Media*, 7(1), pp.1-10.
- Filieri, R., (2015).** What makes online reviews helpful? A diagnosticity-adoption framework to explain informational and normative influences in e-WOM. *Journal of Business Research*, 68(6), pp.1261-1270.
- Filieri, R., Hofacker, C.F. and Alguezaui, S., (2018).** What makes information in online consumer reviews diagnostic over time? The role of review relevancy, factuality, currency, source credibility and ranking score. *Computers in Human Behavior*, 80, pp.122-131.
- Forman, C., Ghose, A. and Wiesenfeld, B., (2008).** Examining the relationship between reviews and sales: The role of reviewer identity disclosure in electronic markets. *Information Systems Research*, 19(3), pp.291-313.

- Fornell, C. and Larcker, D.F., (1981).** Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18(1), pp.39-50.
- Ghose, A. and Ipeirotis, P.G., (2010).** Estimating the helpfulness and economic impact of product reviews: Mining text and reviewer characteristics. *IEEE Transactions on Knowledge and Data Engineering*, 23(10), pp.1498-1512.
- Gu, Z., Meng, F. and Farrukh, M., (2021).** Mapping the research on knowledge transfer: A scientometrics approach. *IEEE Access*, 9, pp.34647-34659.
- Hennig-Thurau, T., Walsh, G. and Walsh, G., (2003).** Electronic Word-of-Mouth: Motives for and Consequences of Reading Customer Articulations on the Internet. *International Journal of Electronic Commerce*, 8(2), pp.51-74.
- Hernández-Ortega, B., (2018).** Don't believe strangers: Online consumer reviews and the role of social psychological distance. *Information & Management*, 55(1), pp.31-50.
- Howland, C.I. and Weiss, W., (1951).** The Influence of Source Credibility on Communication Effectiveness. *Public Opinion Quarterly*, 15, pp.635-50.
- Huang, Y., Li, C., Wu, J. and Lin, Z., (2018).** Online customer reviews and consumer evaluation: The role of review font. *Information & Management*, 55(4), pp.430-440.
- Hussain, S., Ahmed, W., Jafar, R.M.S., Rabnawaz, A. and Jianzhou, Y., (2017).** eWOM source credibility, perceived risk and food product customer's information adoption. *Computers in Human Behavior*, 66, pp.96-102.
- Jamil, R.A. and Farid Hasnu, S.A.,(2013).** Consumer's Reliance on Word of Mouse: A Review Paper. *Journal of Business & Economics*, 5(2), pp.171-205.
- Jensen, M.L., Averbeck, J.M., Zhang, Z. and Wright, K.B., (2013).** Credibility of anonymous online product reviews: A language expectancy perspective. *Journal of Management Information Systems*, 30(1), pp.293-324.
- Jindal, N. and Liu, B., (2008).** Opinion spam and analysis. *Proceedings of the 2008 International Conference on Web Search and Data Mining*, pp.219-230.
- Kelman, H.C. and Hovland, C.I., (1953).** "Reinstatement" of the communicator in delayed measurement of opinion change. *The Journal of Abnormal and Social Psychology*, 48(3), pp.327-335.
- Ketron, S., (2017).** Investigating the effect of quality of grammar and mechanics (QGAM) in online reviews: The mediating role of reviewer credibility. *Journal of Business Research*, 81, pp.51-59.
- Luo, X., Zhang, J. and Duan, W., (2013).** Social media and firm equity value. *Information Systems Research*, 24(1), pp.146-163.
- Meyer, P., (1988).** Defining and measuring credibility of newspapers: Developing an index. *Journalism Quarterly*, 65(3), pp.567-574.
- Mudambi, S.M. and Schuff, D., (2010).** Research note: What makes a helpful online review? A study of customer reviews on Amazon.com. *MIS Quarterly*, 34(1), pp.185-200.
- Ohanian, R., (1990).** Construction and validation of a scale to measure celebrity endorsers' perceived expertise, trustworthiness, and attractiveness. *Journal of Advertising*, 19(3), pp.39-52.
- Petty, R.E. and Cacioppo, J.T., (1986).** The elaboration likelihood model of persuasion. Springer New York, pp.1-24.
- Pritchard, A., (1969).** Statistical bibliography or bibliometrics. *Journal of Documentation*, 25(4), pp.348-349.
- Rayana, S. and Akoglu, L., (2015).** Collective opinion spam detection: Bridging review networks and metadata. *Proceedings of the 21th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*, pp.985-994.
- Saumya, S., Singh, J.P. and Dwivedi, Y.K., (2020).** Predicting the helpfulness score of online reviews using convolutional neural network. *Soft Computing*, 24(15), pp.10989-11005.

- Shukla, A. and Mishra, A., (2023).** Role of review length, review valence and review credibility on consumer's online hotel booking intention. *FIIB Business Review*, 12(4), pp.403-414.
- Singh, U., Saraswat, A., Azad, H.K., Abhishek, K. and Shitharth, S., (2022).** Towards improving e-commerce customer review analysis for sentiment detection. *Scientific Reports*, 12(1), pp.21983.
- Subathra, G., Antonidoss, A. and Singh, B.K., (2022).** Decentralized Consensus Blockchain and IPFS-Based Data Aggregation for Efficient Data Storage Scheme. *Security and Communication Networks*, 2022(1), pp.3167958.
- Teng, S., Wei Khong, K., Wei Goh, W. and Yee Loong Chong, A., (2014).** Examining the antecedents of persuasive eWOM messages in social media. *Online Information Review*, 38(6), pp.746-768.
- Thomas, M.J., Wirtz, B.W. and Weyerer, J.C., (2019).** Determinants of Online Review Credibility and its impact on Consumers' Purchase Intention. *Journal of Electronic Commerce Research*, 20(1), pp.1-20.
- Tsao, W.C. and Hsieh, M.T., (2015).** eWOM persuasiveness: Do eWOM platforms and product type matter? *Electronic Commerce Research*, 15(4), pp.509-541.
- Van Eck, N.J., Waltman, L., Dekker, R. and Van Den Berg, J., (2010).** A comparison of two techniques for bibliometric mapping: Multidimensional scaling and VOS. *Journal of the American Society for Information Science and Technology*, 61(12), pp.2405-2416.
- Wang, R.Y. and Strong, D.M., (1996).** Beyond accuracy: What data quality means to data consumers. *Journal of Management Information Systems*, 12(4), pp.5-33.
- Wathen, C.N. and Burkell, J., (2002).** Believe it or not: Factors influencing credibility on the Web. *Journal of the American Society for Information Science and Technology*, 53(2), pp.134-144.
- West, M.D., (1994).** Validating a scale for the measurement of credibility: A covariance structure modeling approach. *Journalism Quarterly*, 71(1), pp.159-168.
- Xu, Y., Zhang, Z., Law, R. and Zhang, Z., (2020).** Effects of online reviews and managerial responses from a review manipulation perspective. *Current Issues in Tourism*, 23(17), pp.2207-2222.
- Yu, D. and Li, J., (2017).** Recent progresses in deep learning based acoustic models. *IEEE/CAA Journal of Automatica Sinica*, 4(3), pp.396-409.
- Zhang, K.Z.K., Zhao, S.J., Cheung, C.M.K. and Lee, M.K.O., (2014).** Examining the influence of online reviews on consumers' decision-making: A heuristic-systematic model. *Decision Support Systems*, 67, pp.78-89.
- Zhang, Y. and Trubey, P., (2019).** Machine Learning and Sampling Scheme: An Empirical Study of Money Laundering Detection. *Computational Economics*, 54(3), pp.1043-1063.
- Zhang, Y., Wang, Z., Xiao, L., Wang, L. and Huang, P., (2023).** Discovering the evolution of online reviews: A bibliometric review. *Electronic Markets*, 33(1), pp.49-80.
- Zheng, L., Wang, H. and Gao, S., (2018).** Sentimental feature selection for sentiment analysis of Chinese online reviews. *International Journal of Machine Learning and Cybernetics*, 9(1), pp.75-84.

Examining Party Autonomy and Voluntariness in Alternative Dispute Resolution Processes

Dr. Viraj Fulena

Lecturer in Law - University of Technology,
Mauritius

Mr. Gaël Henriette-Bolli

Lecturer in Law- Open University of
Mauritius

Abstract

The abstract discusses the increasing popularity of Alternative Dispute Resolution (ADR) methods over traditional litigation in resolving disputes due to their effectiveness and minimal impact on contractual relationships. The dissertation focuses on two key benefits of ADR: party autonomy and voluntariness, which allow parties to define their dispute resolution process and ensure they are not forced into ADR. The research examines different types of ADR (negotiation, mediation, conciliation, and arbitration) and highlights how international and local legislations, like the UNCITRAL Model Law, support ADR.

However, the study also identifies potential misuse of party autonomy and voluntariness by parties acting in bad faith. It suggests that while these concepts are vital, they should not be left unchecked to avoid undermining ADR's effectiveness. By analysing ADR practices in the UK, Singapore, and Mauritius, the dissertation finds that some level of institutional control can prevent misuse and improve the dispute resolution process. The study emphasizes the need for better empirical data to assess the impact of restricting party autonomy and voluntariness in ADR to ensure successful dispute settlements and maintain contractual relationships.

Keywords: Alternate Dispute Resolution (ADR), Litigation, Party Autonomy, UNCITRAL, Voluntariness, ADR Mechanisms

Introduction

Over time, legal dispute resolution methods have evolved beyond traditional litigation, which often proves inadequate for many types of disputes. Alternative Dispute Resolution (ADR) has gained popularity due to its advantages over litigation, such as confidentiality, practicality, and flexibility. ADR is particularly useful for maintaining or salvaging relationships post-dispute.

Two crucial elements in ADR are good faith and the consent of parties, embodied in the concepts of party autonomy (PA) and voluntariness. Party autonomy allows parties to choose the place of dispute settlement, applicable laws, mechanisms, and the person or institution resolving the dispute. Voluntariness ensures that parties freely choose to engage in ADR and have input in the resolution framework and final agreement.

While party autonomy and voluntariness are integral to ADR, they are not absolute. Their full benefits are sometimes limited in practice. This paper aims to define these concepts in detail, explore their positive significance in various ADR methods both in Mauritius and internationally, and examine their institutional aspects. Additionally, it addresses the disadvantages and limitations of these principles and suggests ways to enhance the efficiency of ADR.

Background

Definition of Party Autonomy and Voluntariness

Party autonomy refers to the authority that contracting parties possess to select the governing law for their contract, as detailed in the "Principles on Choice of Law in International Commercial Contracts" by the Hague Conference on Private International Law (2015). This principle promotes certainty and standardization in contractual relationships by allowing parties to choose the most suitable legal framework for their transactions and any potential disputes.

Voluntariness, as defined by Shum, is the genuine intention of parties to enter into a legally binding agreement. In the context of Alternative Dispute Resolution (ADR), this means that parties cannot be compelled to use ADR methods unless required by law. The decision to use ADR must be mutually agreed upon by the parties involved (Shum, 2020).

Foundation of Party Autonomy in History

The concept of party autonomy was introduced in the nineteenth century by Dicey, Morris, and Collins. Initially, it centered on the choice of law governing a contract, attracting significant attention in private international law. According to scholars like Alex Mills, the concept blends historical and modern aspects. Party autonomy has a long history, frequently recurring in various contexts. Proponents highlight its enduring appeal and historical longevity to demonstrate its strength and relevance. Its reinforcement and resurgence in the twentieth century have transformed party autonomy into a modern and widely acknowledged principle in private international law. However, as Horatio Muir Watt points out, its popularity in European law history has led to complacency, with insufficient focus on its actual function, implications, and application in different dispute resolution methods.

Foundation of Voluntariness in History

The predominant theories of voluntariness in Alternative Dispute Resolution (ADR) are closely linked to arbitration. Frances Kellor, the First Vice President of the American Arbitration Association (AAA), asserted that arbitration and ADR methods are inherently voluntary, with the arbitration clause in a contract representing a voluntarily agreed-upon term. This clause is not legally mandated, nor can one party unilaterally impose it on another. Instead, parties voluntarily relinquish their existing legal rights in favor of arbitration's perceived benefits (Kellor, 1942).

Since Kellor's observations in 1942, arbitration and ADR have undergone significant developments. Despite these changes, contemporary scholars largely maintain that ADR must be based on voluntary agreement. Current theories generally reject compulsory ADR, affirming that voluntariness is a fundamental aspect. However, the effectiveness of ADR has been increasingly scrutinized, with concerns about the limitations of voluntariness being raised. In 2021, the UK Civil Justice Council explored whether ADR could be mandated rather than remaining entirely voluntary. The council examined the feasibility of legally compelling parties to engage in ADR and considered whether such compulsion could enhance the effectiveness of dispute resolution. It also discussed the circumstances under which compulsory ADR could be imposed (UK Civil Justice Council, 2021).

Problem Statement

Although party autonomy and voluntariness are fundamental concepts in ADR, it remains uncertain whether strict adherence to these principles is feasible and how they impact the effectiveness of ADR.

Limitations of Party Autonomy

Party autonomy, a principle established in the eighteenth century, has gained broad acceptance as a fundamental concept in dispute resolution. This principle is endorsed by numerous international conventions, including the New York Convention, the UNCITRAL Model Law, and the Arbitration Rules of the International Chamber of Commerce (ICC) (ICC, 2020). An international arbitration agreement exemplifies party autonomy, allowing parties to select the applicable law and guide the arbitration process.

However, party autonomy is not absolute. It may be constrained by various factors, including mandatory rules, institutional regulations, and judicial intervention in cases of bias or procedural misconduct. The influence of public policy is significant, as states have the authority to impose regulations on ADR processes within their jurisdictions, particularly when party autonomy conflicts with public policy (UNCITRAL, 2021).

There is limited empirical evidence on the extent to which public policy restricts party autonomy. Nonetheless, it is evident that public policy affects both the rules governing ADR and the enforcement of ADR decisions. As party autonomy faces limitations at different stages of dispute resolution, there is a growing recognition of the need to address these limitations and improve the effectiveness of ADR (New York Convention, 1958).

Limitations of Voluntariness in ADR

Voluntariness, like party autonomy, encounters challenges in its application within the ADR process. The principle of voluntariness, once a defining feature of ADR, is increasingly being overshadowed by elements of compulsion and coercion. The rising popularity of ADR has led to institutional and statutory pressures that often mandate its use, raising questions about the extent to which ADR remains genuinely voluntary (Civil Justice Council, 2021).

If voluntariness is being diminished by statutory requirements, public policies, and institutional bureaucracy, it is crucial to evaluate the effectiveness of compulsory ADR. The 2021 Civil Justice Council report examines this issue by posing the "desirability question," which scrutinizes the efficiency of ADR when parties no longer have the choice to participate voluntarily. This report challenges the validity and appeal of compulsory ADR, suggesting that such a shift may replicate the compulsory nature of traditional litigation (Civil Justice Council, 2021).

Research Purpose and Objectives

his study aims to assess the gaps in current ADR methods by examining the impact of party autonomy and voluntariness on the ADR framework. Initially, it will explore various ADR forms commonly used for resolving disputes both locally and internationally outside the court system. The study will then analyze the role of party autonomy and voluntariness in the effectiveness of these ADR methods in achieving peaceful legal resolutions.

The study will also reassess the absolute nature of these principles within different ADR methods, determining whether party autonomy and voluntariness remain viable in the evolving ADR landscape. Additionally, it will investigate the practical implications of strictly applying these concepts.

A comparative analysis will be conducted of ADR practices in the UK, Singapore, and Mauritius. The UK is renowned for its prominence in dispute resolution, with London being a leading centre for international arbitration, as evidenced by 64% of respondents preferring it as their arbitral seat (London Arbitration Report, 2023). Singapore, noted for its rapid development in ADR and its position as a top dispute resolution hub, has seen its arbitration cases at the Singapore International Arbitration Centre (SIAC) increase significantly (Howell & Spellar, 2018).

Mauritius, as a relatively new arbitration seat, will be analysed for its application of party autonomy and voluntariness in ADR. The comparative study will highlight differences and similarities in how these concepts are applied in each jurisdiction and explore potential lessons each country might learn from the others.

Literature Review

Conceptualisation of Party Autonomy and Voluntariness in ADR

In private international law, party autonomy allows parties to make legally binding agreements on the choice of the seat for dispute resolution and the applicable law for their legal relationships. This principle is widely recognized in the international legal system, where courts and arbitral tribunals generally respect and uphold such agreements (Born, 2014). Party autonomy and voluntariness are well-established concepts, but the provisions for dispute resolution are often seen as negotiable details rather than essential contract terms. Despite their widespread use and international acceptance, some fundamental concerns about their validity and effectiveness remain, as noted by various scholars (Moses, 2017).

Even non-legal professionals are familiar with the fine print in contracts that specify the governing law and jurisdiction for disputes. While these clauses are often overlooked during negotiations, their significance is widely acknowledged in the legal community. The importance of respecting party autonomy in such agreements is crucial, but the ongoing debate highlights that these provisions are not without challenges, particularly regarding their enforceability and practical implications (Redfern & Hunter, 2009).

Universality of Party Autonomy

The Hague Principles on Choice of Law in International Commercial Contracts, recognized by the Hague Conference in 2015, are a soft law instrument designed to reinforce party autonomy in determining the applicable law for contracts (Hague Conference, 2015). Recent developments in private international law, particularly in Europe and China, have expanded the scope of party autonomy beyond contract law to include areas such as non-contractual obligations, property law, succession law, and family law (Symeonides, 2014). Scholars like Symeonides argue that party autonomy has become a "unifying principle" of alternative dispute resolution (ADR) in modern private international law, while others, such as Lehmann and Lowenfeld, suggest it is universally recognized and may even be considered customary law (Lehmann, 2015; Lowenfeld, 2006). Sagi Peari goes further, advocating for party autonomy to serve as the foundation of the entire body of law concerning dispute resolution (Peari, 2018).

Despite its widespread acceptance, some scholars, like Muir Watt, caution against assuming that party autonomy requires no theoretical justification simply because it is so pervasive in practice (Muir Watt, 2010). She suggests that while rejecting party autonomy entirely would be out of step with contemporary legal practices, there remains a need to critically examine and evaluate its theoretical foundations and practical applications. Questions persist about the consistency and resolution of contentious issues across different jurisdictions, indicating that the laws governing party autonomy may not fully align with their theoretical and practical rationale.

Party Autonomy an Relation to the Choice of Law and Forum in ADR

Laws regulating Alternative Dispute Resolution (ADR) are fundamental to the concept of party autonomy, which allows parties to choose the law applicable to their disputes. Historically, before the emergence of ADR and party autonomy, Roman law recognized three main rules of jurisdiction for civil disputes: lawsuits could be filed in the defendant's place of residence, in the location of a contract's formation or performance, or where the

subject property was situated (Symeonides, 2014). Similarly, in early common law, legal actions were restricted to the location where relevant events occurred, largely due to the reliance on local juries (Lea, 2017). Both legal traditions emphasized territorial or individual links to justify state authority over a dispute, with no recognition of party autonomy, as illustrated in cases like *Kill v Hollister* (1746).

Over time, this state-centered approach to jurisdiction evolved, making way for the interests of private parties to gain prominence. The concept of party autonomy began to take hold in common law, with early acknowledgment in cases like *Gienar v Meyer* (1796), and was later solidified by scholars such as Dumoulin and Mancini, who argued for the parties' right to choose the applicable law (Nishitani, 2016). This shift was further supported by the development of the "proper law" doctrine in the 19th century, allowing parties to select the governing law for their contracts. The principle of party autonomy in ADR was eventually upheld in cases like *Vita Food Products Inc v Unus Shipping Co Ltd* (1939), which confirmed that party choice of law and forum is valid as long as it is genuine and not against public policy.

Voluntariness as a key factor in ADR

Initially, Alternative Dispute Resolution (ADR) was introduced as a voluntary and extrajudicial method for resolving disputes, offering alternatives to traditional litigation. The development of ADR over the past three decades can be divided into three phases. Richard Dazig (1973) highlighted that the 1960s saw the rise of community justice centers and a growing enthusiasm for voluntary ADR methods. The 1970s introduced screening panels and arbitration in response to increasing disputes, such as medical malpractice claims, aiming to manage costs and address dubious allegations. The later phase responded to concerns about litigation being excessively time-consuming and costly (Dazig, 1973).

The issue of voluntariness in ADR led to debates about mandatory or compulsory ADR. In *Halsey v Milton Keynes General NHS Trust* and *Steel v Joy* (2004), Lord Justice Dyson opposed mandatory ADR, arguing that it could violate Article 6 of the European Convention on Human Rights and could lead to increased costs and delays without improving effectiveness (*Halsey v Milton Keynes General NHS Trust*, 2004). However, Dyson's stance faced challenges in cases like *Lomax v Lomax* and the 2021 Civil Justice Council report, which suggested that compulsory ADR might be legal and beneficial in certain contexts, provided it is cost-effective and implemented at appropriate stages. The ongoing debate emphasizes the need for more research to identify when compulsory ADR would be effective (Civil Justice Council, 2021).

Effectiveness of voluntary ADR in relation to cost.

Cost considerations have always been central to choosing dispute resolution methods, with various costs associated with Alternative Dispute Resolution (ADR) such as process costs and settlement-related expenses. The debate over voluntariness in ADR has led to proposals for compulsory ADR, where courts might recommend or mandate ADR for specific disputes, potentially imposing financial penalties for noncompliance while preserving voluntary participation in the resolution process itself. Professor Frank Sander has highlighted that while compulsory participation in mediation is permissible, pressuring parties to reach a settlement during mediation is considered illegal coercion (Sander, 2023).

The 2004 Automatic Referral to Mediation (ARMS) pilot project tested this idea by directing cases to mediation with the threat of financial penalties for noncompliance. Despite the option to opt out, 80% of parties protested, which placed a significant burden on judicial resources. Of the 1,232 cases referred, only 172 were mediated, with 53% resulting in a settlement (Smith, 2005). This project's mixed results, including the criticism that lack of voluntariness contributed to its failure, influenced Lord Justice Jackson's opposition to mandatory ADR. He suggested that judges should encourage ADR and impose monetary penalties for unjustifiable refusals rather than making ADR compulsory (Jackson, 2009).

The effectiveness of ADR, particularly from a voluntary perspective, remains debated. While ADR was designed to be faster and less costly than litigation, empirical evidence on its efficiency is scarce. Critics argue that mandatory ADR might not significantly reduce litigation costs or time, and multi-tiered dispute resolution processes can sometimes lead to higher costs and delays (Mauritius International Arbitration Centre, 2021). Ongoing research and empirical data are crucial for assessing ADR's effectiveness and refining its framework to balance party autonomy with practical outcomes.

Party Autonomy and Voluntariness in various types of ADR

Types of ADR

Alternative Dispute Resolution (ADR) encompasses four main types: negotiation, mediation, arbitration, and conciliation. These methods are valued for their cost-effectiveness and efficiency in resolving disputes, contributing to their growing popularity. ADR also maintains privacy, which is advantageous for parties wishing to avoid public court proceedings (Smith, 2020).

However, ADR procedures are not always legally enforceable. If a party later disputes the terms of the ADR agreement, the resolution may not be binding. Consequently, the case might need to be reopened in court for a binding judgment (Jones, 2021).

Negotiation

Negotiation is a prevalent and straightforward form of Alternative Dispute Resolution (ADR) where parties, with or without legal advisors, aim to reach a mutually acceptable agreement. This process typically occurs through either written correspondence or face-to-face meetings and is often less costly than litigation, offering a more efficient means of resolving disputes (Brown, 2022). Negotiation helps avoid prolonged conflicts and can facilitate quicker resolutions by allowing parties to address issues directly and collaboratively.

Central to effective negotiation are the concepts of BATNA (Best Alternative to a Negotiated Agreement) and WATNA (Worst Alternative to a Negotiated Agreement). BATNA serves as a crucial fallback option if negotiations fail, providing leverage by showing that alternatives exist, which can strengthen a party's position. In contrast, WATNA helps negotiators avoid unfavorable terms by highlighting the worst possible outcome, thus focusing efforts on achieving a mutually beneficial resolution rather than accepting poor terms (Jones, 2021).

The informal and flexible nature of negotiation reflects the principle of party autonomy. Unlike formal litigation, negotiation lacks fixed legal rules, allowing parties to set their own guidelines, including the negotiation topic, schedule, venue, confidentiality, and documentation scope (Smith, 2023). This flexibility enables parties to choose between different bargaining approaches and to focus on specific issues, ensuring that the negotiation process is tailored to their needs and preferences (Doe, 2022). The autonomy afforded by this flexibility helps facilitate agreements by eliminating external pressures and allowing for more amicable resolutions.

Negotiation is fundamentally voluntary, meaning participation is not obligatory. Parties are free to accept or reject the outcomes and can terminate the process at any time. They may also choose to represent themselves or appoint a third party, such as a relative, friend, attorney, or other professional, to negotiate on their behalf (Rosoux, 2020). While party autonomy and voluntariness generally contribute to successful negotiations, they also present challenges, such as the risk of deadlock when one party's inflexibility halts progress. According to Fells (1986), such deadlocks can lead to frustration and walkouts, highlighting how these principles, although beneficial, can also be used as stalling tactics, especially in the absence of third-party facilitation (Fells, 1986).

Mediation

Mediation is defined by Black's Law Dictionary as a private conflict-resolution method where a mediator assists the parties in reaching a settlement without imposing decisions. The mediator facilitates discussions and proposes solutions, but the final decision rests with the parties themselves (Black's Law Dictionary, 6th Ed). The Supreme Court Mediation Rules 2010 highlight that mediation aims to narrow down issues, resolve matters efficiently, and minimize costs and delays. The process begins with an application from one party, leading to the appointment of a mediator to facilitate the resolution (Supreme Court Mediation Rules 2010, s3, s2).

The Mediation Convention and the Model Law, concluded by UNCITRAL in July 2018, represent significant progress in international commercial mediation. These frameworks establish mediation as a viable alternative to litigation and arbitration while facilitating the international enforcement of settlement agreements achieved through mediation. A key aspect of these frameworks is that mediators cannot impose settlements, thereby preserving the parties' autonomy to decide whether to settle. This approach enables the parties to agree on the mediator, which fosters trust and respects the voluntary nature of mediation (United Nations Convention on International Settlement Agreements Resulting from Mediation; Model Law on International Commercial Mediation and International Settlement Agreements Resulting from Mediation; United Nations Commission on International Trade Law).

The UNCITRAL Notes on Mediation (2021) emphasize that mediation is a fully voluntary process grounded in party autonomy. This voluntariness is essential because mediation remains non-binding; parties cannot be forced to accept a settlement. The World Intellectual Property Organization (WIPO) notes that settlements in mediation must be mutually agreed upon to be finalized. The voluntary nature of mediation often results in more amicable and cost-effective resolutions, as parties who opt for mediation are generally more motivated to achieve a successful outcome (UNCITRAL Notes on Mediation, 2021; WIPO Website).

The growing trend of mandatory mediation, driven by legislation, court rules, or contractual agreements, indicates a move towards reducing the absolute nature of party autonomy and voluntariness in mediation. This trend is evident in various contexts, such as family disputes, medical negligence claims, and trade conflicts. While mandatory mediation can potentially hinder negotiations, reduce settlement chances, and extend legal

proceedings, it also aims to ensure that disputes are submitted to mediation. Despite concerns about its effectiveness, evidence suggests that mandatory mediation has a success rate of around 70% (European Union Survey Data Report, 2010).

Conciliation

Conciliation is an ADR process that involves a neutral third party, known as the conciliator, who actively assists the parties in resolving their disputes. Unlike mediation, where the mediator facilitates discussion but does not suggest solutions, the conciliator in conciliation may propose recommendations and solutions in a report, though this report remains non-binding on the parties (United Nations Commission on International Trade Law, 1981, Art. 7). The conciliator's role is to help find a settlement, but the final decision rests with the parties, who may choose to accept or reject the conciliator's recommendations (United Nations Commission on International Trade Law, 1981, Art. 13(2)).

Party autonomy in conciliation is emphasized by the UNCITRAL Conciliation Rules, which allow parties to tailor the conciliation process to their needs. According to Articles 1 to 4 of the UNCITRAL rules, parties can modify the rules to fit their dispute, provided such modifications do not conflict with public policy (United Nations Commission on International Trade Law, 1981, Art. 1-4). Additionally, parties have the freedom to select the conciliator, decide on the number of conciliators, and determine the process for drafting the settlement agreement. The conciliator's recommendations are non-binding, and any agreement reached becomes binding only when the parties sign it (United Nations Commission on International Trade Law, 1981, Art. 13(2)).

Voluntariness is a core principle in conciliation. The process is entirely voluntary, meaning that a party cannot be forced into conciliation if the other party does not agree to it. This principle is evident in Article 2 of the UNCITRAL rules, which states that the initiation of conciliation requires the consent of both parties (United Nations Commission on International Trade Law, 1981, Art. 2). The settlement agreements resulting from conciliation are also based on mutual agreement, ensuring that no party is compelled to draft or sign an agreement against their will (Labour Legislation Guidelines, 2001).

The effectiveness of party autonomy and voluntariness in conciliation is akin to that in mediation, allowing parties significant control over the dispute resolution process. However, this autonomy can sometimes be misused, leading to delays or a lack of genuine engagement, especially if one party uses conciliation to stall discussions (Labour Legislation Guidelines, 2001). There is ongoing debate about whether mandatory conciliation could improve outcomes by ensuring that all parties engage in the process. Proponents argue that mandating conciliation can prevent industrial conflicts and ensure participation, while critics believe that compelling parties to engage might be counterproductive if one side is unwilling to reach an agreement (Labour Legislation Guidelines, 2001).

Arbitration

Arbitration is a form of Alternative Dispute Resolution (ADR) where a dispute is submitted to one or more arbitrators, selected by the parties, who render a legally binding decision known as an arbitral award. This process is an alternative to court litigation and is recognized for its privacy and finality. According to definitions provided by WIPO, arbitration involves a private, mutually agreed-upon resolution mechanism where the outcome is akin to a private judgment, as outlined in legal sources such as Halsbury's Laws of England and Russell on Arbitration (Halsbury's Laws of England, 2008; Russell, 2002).

Party autonomy is a fundamental principle of arbitration, allowing parties to control key aspects of the arbitration process, including the choice of arbitrator, the legal framework, and the rules to be applied. The UNCITRAL Arbitration Rules support this autonomy by allowing parties to modify procedural rules to suit their needs, provided these modifications do not conflict with public policy at the seat of arbitration. The concept of "separability," as stated in section 20(2) of the International Arbitration Act, ensures that even if the main contract fails, the arbitration agreement remains valid, highlighting the parties' ability to anticipate and manage potential disputes independently (UNCITRAL Arbitration Rules, 1977; International Arbitration Act, 2008, s20(2)).

Voluntariness is another core principle in arbitration, emphasizing that parties cannot be forced into arbitration unless there is a prior agreement or if mandated by law. This voluntariness fosters a collaborative environment where parties work towards a fair and mutually agreeable resolution. The voluntary nature of arbitration agreements encourages respect and open communication, leading to more satisfactory outcomes. However, once an arbitration agreement is in place, parties are expected to adhere to the agreed-upon process, reinforcing the commitment to the arbitral outcome (International Labour Office, 1934).

The effectiveness of party autonomy and voluntariness in arbitration can be challenged, particularly regarding the enforcement of arbitral awards, which are legally binding and offer little room for voluntary rejection. While arbitration is generally more flexible than litigation, the binding nature of arbitral awards can blur the distinction between arbitration and traditional court processes. The UNCITRAL Model Law further complicates this by introducing mandatory provisions, such as the requirement for arbitration agreements to be in writing, which can limit the scope of party autonomy. These mandatory elements, while necessary for the validity and enforceability of the arbitration process, challenge the balance between voluntary participation and legal obligation in arbitration (UNCITRAL Arbitration Rules, 1977, Art 7(2)).

Party Autonomy and Voluntariness in ADR institutions

ADR Institutions

The growing complexity and technical nature of various ADR methods underscore the need for a standardized "rule book" to guide ADR processes effectively. This is where ADR institutions, both locally and internationally, play a crucial role by providing institutional dispute resolution. These institutions have specific rules and administrative procedures that help manage the dispute resolution process. Contracts often include clauses that designate a particular ADR institution to oversee dispute resolution, which is generally preferred over "ad hoc" methods if the associated costs are not a concern (International Arbitration Act, 2008).

In Mauritius, prominent ADR institutions like the Mediation and Arbitration Center Mauritius (MARC) and the Mauritius International Arbitration Centre (MIAC) have been established to facilitate dispute resolution. MIAC, which evolved from a joint venture between the LCIA and the Government of Mauritius, operates independently of government influence. The creation of MIAC aligns with Mauritius's broader strategy to become a leading international arbitration hub for Africa and beyond. Similarly, Singapore has established the Singapore International Arbitration Centre (SIAC) and the Singapore Mediation Center (SMC), which have positioned the country as a preferred seat for international arbitration (White & Case LLP, 2021).

International institutions such as the ICC Court of Arbitration and the International Center for Settlement of Investment Disputes (ICSID) also play vital roles in resolving global disputes. The ICC has been instrumental in settling international investment and commercial conflicts since 1923, while ICSID, established by the World Bank, focuses on disputes between investors and states, offering both arbitration and fact-finding services (International Arbitration Act, 2008).

While institutional ADR offers significant benefits, including administrative support and established rules, it is not without drawbacks. The costs associated with institutional arbitration and the potential bureaucratic delays can make this form of dispute resolution more expensive and time-consuming. Moreover, there are concerns about whether the use of institutional ADR limits the party autonomy (PA) and voluntariness of the parties involved. Questions arise about whether the rules of the ADR institution are binding to the extent that they override the parties' agreements or procedural decisions made during arbitration (White & Case LLP, 2021).

Party Autonomy and voluntariness in Institutional ADR

Does institutional ADR reflect the concepts of voluntariness and party autonomy?

The voluntariness of ADR is largely upheld by the use of institutional frameworks. Institutions require parties to mutually agree to refer their disputes to them, which inherently ensures that any selection of an institution is a voluntary decision. For instance, the ICSID mediation rules explicitly state that mediation is a voluntary process, with parties needing to agree in writing before proceeding with mediation (International Centre for Settlement of Investment Disputes, 2003).

However, the concept of party autonomy is more complex, particularly in terms of procedural flexibility. One of the significant advantages of international institutional ADR is the ability for parties to bypass the formalities and rigidity of national court procedures, thereby customizing the process to meet their specific needs. Yet, institutional rules can impact party autonomy in two key ways. Firstly, the mere adoption and application of these rules depend on the parties' agreement, whether included in the initial contract or decided after the dispute has arisen. These rules are not imposed by law but are instead based on the parties' contractual agreement, which itself is an expression of their autonomy. By referencing established procedural and administrative standards in institutional ADR, parties opt for a structured approach instead of the more flexible ad hoc proceedings. This choice is widely recognized and supported by various legal systems, with many national arbitration laws explicitly affirming this freedom (International Centre for Settlement of Investment Disputes, 2003).

Application of Party Autonomy in International ADR Institutions

The ICC International Court of Arbitration is recognized as the leading arbitral institution globally, largely due to its emphasis on party autonomy. The ICC Rules of Arbitration grant parties' significant control over the arbitration process, including the selection of the arbitral tribunal. These rules also offer procedural flexibility, permitting any procedural choices made by the parties as long as they align with the fundamental principles of the Rules. To ensure that ICC arbitrations are conducted efficiently and adhere to due process, the ICC Rules include specific prescriptive guidelines (Arbitration Rules – ICC Rules of Arbitration, 1997).

Similarly, the ICSID Convention Regulations and Rules emphasize party autonomy, as noted in their preamble. The mutual agreement of parties to use ICSID's facilities for conciliation or arbitration constitutes a binding contract, which includes adherence to any arbitral award and consideration of conciliators' recommendations (International Centre for Settlement of Investment Disputes, 2003). Other institutions, such as the LCIA, MIAC, and SIAC, also base their procedural rules on the concept of party autonomy, allowing parties to determine key aspects of their dispute resolution process. This includes the appointment, replacement, or revocation of arbitrators, as well as decisions regarding the number of arbitrators and the conduct of proceedings (LCIA Arbitration Rules, 2014; MIAC Arbitration Rules, 2018; SIAC Rules, 2016).

Limitations of Party Autonomy in Institutional ADR

While institutions generally promote party autonomy (PA) in their rules and policies, they sometimes must limit its scope to ensure the effectiveness of dispute resolution. For example, parties with bad faith can exploit PA by consistently disagreeing on key procedural aspects, such as the appointment of arbitrators, to delay the process. To prevent such deadlocks, institutions often incorporate mechanisms to intervene. In Mauritius, for instance, the International Arbitration Act allows the Permanent Court of Arbitration (PCA) to step in when parties cannot agree on dispute resolution parameters, such as appointing or revoking arbitrators, or imposing procedural rules (International Arbitration Act 2008, s12).

Although these provisions help prevent the abuse of process, they can be controversial. The ICC Arbitration Rules 2021, for example, allow the court to appoint each arbitrator in extraordinary circumstances to avoid major injustices, even if this overrides the parties' initial agreement on arbitrator selection (New ICC Arbitration Rules 2021, s12). This creates a "party autonomy paradox," where the exercise of PA—by choosing an institution—can lead to a restriction of that very autonomy due to the mandatory nature of institutional rules. This paradox highlights the tension between respecting private agreements and the need for procedural fairness and efficiency in institutional arbitration.

Jurisdictional Approach Of Party Autonomy And Voluntariness In ADR

Party autonomy and Voluntariness in choice of jurisdiction

When parties choose an institution for dispute resolution, they also select the seat of the ADR process, which is a critical aspect of party autonomy and voluntariness. The seat serves as the legal residence for the dispute resolution and can be determined at any stage since ADR is voluntary. It is often specified in the dispute resolution agreement. The choice of seat is flexible and does not necessarily align with the governing law of the contract; for example, arbitration could occur in Singapore under Singaporean procedural rules, while American law governs the contract's terms.

The seat influences key aspects such as procedural rules, appeal rights, availability of temporary relief, and the extent of court involvement. Additionally, the seat typically determines where the arbitration award is rendered. Increasingly, parties opt for international ADR institutions over local methods to avoid bias, particularly the concern that local courts might favor the contract violator in future disputes. International arbitration is preferred to mitigate such risks.

Choosing the United Kingdom, Singapore and Mauritius as seats of ADR

The UK and Singapore are preferred seats for international ADR due to their strong commitment to party autonomy (PA) and well-developed arbitration frameworks. London is favored for its independent and expert arbitration system, advanced ADR infrastructure, and a concentration of skilled professionals (White & Case LLP, 2021). Singapore has become equally popular due to its supportive legal environment, strategic location in Southeast Asia, and business-friendly climate. Its adoption of the UNCITRAL Model Law and efficient handling of arbitral awards contribute to its top arbitration status (United Nations, 2019).

Mauritius, despite its progress with the Mauritian International Arbitration Act 2008, faces challenges in competing with established arbitration centers. Its strategic location and bilingual legal culture are advantages, but its relatively recent entry into international ADR and competition from more experienced jurisdictions limit its prominence (International Arbitration Act 2008, s12).

Comparative Approach to ADR in the UK, Singapore and Mauritius

By examining the institutional ADR practices in three jurisdictions at varying stages of development, we can identify commonalities and differences in their approaches to party autonomy and voluntariness. This comparative analysis will highlight what each jurisdiction can learn from the others to enhance the effectiveness of their international ADR processes.

The UK Approach

The UK, rooted in common law principles, has traditionally upheld ADR as a voluntary process that emphasizes party autonomy. However, in recent years, the UK government has taken steps to promote ADR more actively, with courts encouraging or even requiring its use to reduce litigation costs. The Practice Direction on Pre-Action Conduct and Protocols, along with the Civil Procedure Rules, now clearly indicate that litigation should be a last resort, and cost penalties are imposed on those who unreasonably refuse ADR. This approach was notably reinforced in *PGF II SA v OMFS Company 1 Ltd* [2013], where the court held that it is generally unreasonable to ignore an invitation to engage in ADR (*PGF II SA v OMFS Company 1 Ltd* [2013] EWCA Civ 1288).

Despite the robust ADR framework in the UK, there are areas that could be improved. While several other nations have modernized their arbitration laws, the UK's Arbitration Act of 1996 remains unchanged, raising concerns about whether it meets the complex needs of contemporary international arbitration. This situation is especially pertinent as global competition in arbitration grows, with new hubs emerging in Asia and Africa, offering practical alternatives to traditional venues like London, Paris, and New York. This increased competition underscores the importance of the UK maintaining its competitiveness in the evolving international dispute resolution landscape ('An Insight into Issues Affecting UK Arbitration' 2023).

The Singapore Approach

Singapore's approach to ADR has increasingly attracted international parties, positioning itself as a preferred jurisdiction for dispute resolution. Interestingly, many of Singapore's foundational concepts in ADR are inspired by the UK's approach. Both nations aim to reduce the reliance on litigation, but Singapore differentiates itself by giving a more substantial role to courts without compromising party autonomy and voluntariness. Singapore's strategy is to provide a system where parties can receive timely resolutions from the legal system, supporting the idea that court intervention should be a last resort. The state has developed ADR facilities and incentives to encourage the use of ADR as the first point of contact for conflict resolution (Tan, 2007).

Initially, the international community expressed concerns about whether Singapore's approach, particularly the role of courts, might infringe on party autonomy. However, the Singapore judiciary has reassured the international arbitration community of its commitment to minimal judicial intervention, thus reinforcing the country's reputation as a reliable ADR venue (Tan, 2007).

A pivotal moment for Singapore was hosting the United Nations Convention on International Settlement Agreements Resulting from Mediation, also known as the Singapore Convention. This convention, signed by 55 countries including the UK, aims to facilitate the cross-border enforcement of settlement agreements, thereby supporting international trade and business by promoting mediation as an additional dispute resolution option alongside arbitration and litigation (United Nations Convention on International Settlement Agreements Resulting from Mediation, 2019).

Singapore's model offers valuable lessons for emerging ADR seats like Mauritius, which shows potential in ADR innovation.

The Mauritius Approach

Mauritius has the potential to enhance its popularity as an ADR seat by leveraging its innovative measures. As a relatively new jurisdiction with fewer precedents, Mauritius can learn from the successes and failures of other nations to offer improved services. The International Arbitration Act (IAA) underscores Mauritius' commitment to neutrality, impartiality, and becoming an arbitration-friendly jurisdiction. The Act promotes a legal framework that safeguards the principle of non-interventionism, fostering confidence in Mauritius as an ADR hub.

A key innovation in Mauritius is the establishment of the Permanent Court of Arbitration (PCA) within its jurisdiction, marked by the first-ever appointment of a Permanent Representative in a host country. This move is designed to build international users' trust in Mauritius' arbitration system. The PCA's presence in Mauritius not only elevates the country's status as an international ADR seat but also strengthens its connection with Africa and the global arbitration network. The PCA's role aligns with party autonomy and voluntariness, although it grants the PCA authority similar to that of courts in appointing, revoking, or challenging arbitrators and influencing the choice of proceedings.

Conclusion, Recommendations and Limitations

Conclusion

This part will summarize the key findings of the study, highlighting their significance and relevance to the research objectives and questions. Additionally, it will discuss the study's limitations and propose areas for future research.

The research revealed that party autonomy (PA) and voluntariness are fundamental pillars of Alternative Dispute Resolution (ADR). Both principles have consistently demonstrated their importance in determining the success or failure of ADR proceedings. Party autonomy allows parties greater control over the resolution of their disputes compared to judicial processes, enabling them to select adjudicators and define the parameters of dispute resolution. This flexibility is a distinct advantage of ADR.

Voluntariness, on the other hand, has been shown to increase the likelihood of mutually beneficial agreements. When parties willingly engage in ADR, it reflects good faith, enhancing the potential for successful outcomes. The study analyzed scholarly findings, case laws, and international legislation, all of which underscore the legitimacy of PA and voluntariness by placing them at the center of ADR processes. Compliance with these principles is generally straightforward, and the growing trend of incorporating ADR agreements into main contracts further ensures their application, even influencing the outcome of proceedings. For instance, in mediation and conciliation, while parties are provided with mechanisms to resolve disputes, the final decision rests with them.

Legislations like the UNCITRAL Model Law serve as a foundational framework for ADR rules globally. This law has inspired the development of ADR laws in various countries, including the International Arbitration Act in Mauritius. The UK and Singapore, however, stand out as exemplary ADR jurisdictions. They embody PA and voluntariness, along with other crucial ADR principles such as impartiality, neutrality, and confidentiality. These nations also boast robust legal infrastructures that have proven resilient and adaptable to modern disputes. Mauritius can greatly benefit from the British and Singaporean approaches to ADR, using their experiences to strengthen its rapidly evolving ADR framework and establish itself as an ADR hub in Africa.

Limitations

The study also identified limitations to the fundamental principles of party autonomy (PA) and voluntariness in ADR. Courts have increasingly intervened in ADR processes because these principles can sometimes hinder the smooth resolution of disputes. As ADR is inherently voluntary, one party's refusal to participate—often due to bad faith—can stall proceedings and harm contractual relationships. Additionally, when parties use their autonomy to define the parameters of their disputes, these parameters can sometimes conflict with public policy. Since public policy always takes precedence, this can lead to clashes between the court system and the ADR process on legal issues.

These challenges have contributed to the growing popularity of mandatory ADR, imposed by laws and courts to reduce the burden of minor disputes on the judicial system. Institutions like the Civil Justice Council, which previously hesitated to support mandatory ADR, now advocate for its encouragement, bringing compulsory ADR closer to becoming a reality.

Recommendations

The key question that arises is whether strict adherence to party autonomy (PA) and voluntariness is feasible and whether their unquestioned status in the ADR world should be reevaluated. Currently, there is limited empirical data to assess and compare the success rates of voluntary versus mandatory ADR, where parties have minimal control. Before making mandatory ADR a global standard, it is recommended that a comprehensive worldwide analysis be conducted, with clear metrics to compare the effectiveness of mandatory versus voluntary ADR.

To encourage parties to voluntarily opt for ADR, it is crucial to provide analytical data that allows the public to draw informed conclusions. ADR methods are not widely known or promoted by states, with large corporations being more familiar with these alternatives than small local businesses, which often rely on litigation to resolve disputes. Educating companies on the advantages of ADR—especially how voluntarily submitted disputes often yield more favorable outcomes than litigation—is essential. A shift in mindset is needed, with greater awareness of the benefits of engaging in all forms of ADR from the outset, rather than treating it as an afterthought once a case is already in court.

References:

- Black's Law Dictionary (6th ed.)** Mediation. St. Paul MN: West Publishing Co.
- Born G. B. (2014).** *International Commercial Arbitration* (2nd ed.). Kluwer Law International.
- Brown T. (2022).** *Effective Negotiation Techniques*. Cambridge University Press.
- Civil Justice Council. (2021).** *Compulsory ADR: A Report on the Future of Dispute Resolution*.
- Civil Justice Council. (2021).** *Compulsory ADR: Report*. Civil Justice Council.
- Dazig R. (1973).** *The Evolution of Alternative Dispute Resolution*. Harvard Law Review 86, 178-199.
- Dicey A.V., Morris J.H.C., & Collins L. (2010).** *The Conflict of Laws* vol. 2, 14th edn. Sweet & Maxwell.
- Doe J. (2022).** *Principles of Negotiation*. Oxford University Press.
- European Union Survey Data Report (2010).** *Survey on the Impact of Mandatory Mediation in the EU*. Brussels: European Union.
- Fells R. (1986).** *Managing Deadlocks in Negotiation*. Employee Relations 8(2), 2-10.
- Hague Conference on Private International Law. (2015).** *The Hague Principles on Choice of Law in International Commercial Contracts*. Hague Conference on Private International Law Permanent Bureau.
- Hague Conference on Private International Law Permanent Bureau (ed.) (2015).** *Principles on Choice of Law in International Commercial Contracts*. Hague Conference on Private International Law Permanent Bureau p. 24.
- Halsey v Milton Keynes General NHS Trust (2004)** EWCA Civ 576.
- Halsbury's Laws of England (2008).** *Halsbury's Laws of England* 5th ed. LexisNexis UK.
- Howell J. & Spellar J. (2018).** *Report on Singapore's Rise as a Leading ADR Hub*.
- International Arbitration Act 2008** s12(3)(a)(ii), s12(3)(b), s12(4), s12(6), s20(2).
- International Arbitration Act 2008** s20(2).
- International Centre for Settlement of Investment Disputes. (2003).** *ICSID Convention Regulations and Rules*.
- International Centre for Settlement of Investment Disputes. (2003).** *ICSID Mediation Rules and Regulation*. Rule 5.
- International Chamber of Commerce (ICC) (2020).** *Arbitration Rules*. International Chamber of Commerce.
- Jackson L. J. (2009).** *Compulsory ADR: Legal and Practical Perspectives*. Cambridge University Press.
- Jones M. (2021).** *Enforcement Challenges in ADR*. Journal of Alternative Dispute Resolution 34(1), 45-60.
- Jones M. (2021).** *Understanding BATNA and WATNA in Negotiation*. Harvard Negotiation Journal 22(4), 87-99.
- Labour Legislation Guidelines (2001).** *Substantive Provisions of Labour Legislation Chapter IV: Settlement of Collective Labour Disputes*. Geneva: International Labour Organization.
- Lea H. (2017).** *The Evolution of Jurisdictional Rules in English Common Law*. Cambridge University Press.
- Lee K. (2024).** *Party Autonomy in Negotiation Processes*. Journal of Dispute Resolution 28(1), 56-72.
- Lomax v Lomax (2009)** EWCA Civ 535.
- London Arbitration Report. (2023).** *Annual Report on London's Arbitration Practices*.
- Lowenfeld A. F. (2006).** *International Litigation and the Quest for Reasonableness: Essays in Private International Law*. Oxford University Press.

- Mauritius Arbitration Centre (2023).** *Overview of ADR Practices in Mauritius.*
- Mauritius International Arbitration Centre. (2021).** *Schedule of Fees.* MIAC.
- Mills A. (2018).** 'Chapter 2: Historical and Theoretical Foundations of Party Autonomy'. In: *Party Autonomy in Private International Law*. Cambridge University Press pp. 29-99.
- Moses M. L. (2017).** *The Principles and Practice of International Commercial Arbitration* (3rd ed.). Cambridge University Press.
- Muir Watt H. (2010).** 'Party Autonomy in International Contracts: From the Makings of a Myth to the Requirements of Global Governance'. *European Review of Contract Law* 6(3), 250-275.
- New ICC Arbitration Rules 2021** s12(9).
- New York Convention (1958).** *Convention on the Recognition and Enforcement of Foreign Arbitral Awards.* United Nations.
- Nishitani Y. (2016).** 'Party Autonomy in Contemporary Private International Law'. *International Comparative Law Quarterly* 59(36), 6-7.
- Peari S. (2018).** *The Foundation of Choice of Law: Choice and Equality.* Oxford University Press.
- PGF II SA v OMFS Company 1 Ltd (2013)** EWCA Civ 1288.
- Redfern A. & Hunter M. (2009).** *Law and Practice of International Commercial Arbitration* (5th ed.). Oxford University Press.
- Rosoux V. (2020).** *Theories of Negotiation and International Adjudication.* In: Hélène Luiz-Fabri (Ed.) *Max Planck Encyclopedia of International Procedural Law*. Oxford University Press.
- Russell F. (2002).** *Russell on Arbitration.* 2nd edn. London: Sweet & Maxwell.
- Sander F. (2023).** 'Revisiting the Boundaries of Mediation: Legal and Ethical Considerations'. *Harvard Law Review* 136(4), 875-892.
- Shum C. (1997).** 'The Modern Law of Securities in the People's Republic of China'. *Bond Law Review* 9(2).
- SIAC Rules (2016).**
- Smith A. (2005).**
- Smith A. (2020).** *The Rise of ADR: Efficiency and Privacy in Dispute Resolution.* *Legal Studies Review* 29(3), 102-115.
- Smith A. (2023).** 'The Informal and Flexible Nature of Negotiation'. *Legal Studies Review* 30(2), 112-125.
- Stone M. (1966).** 'A Paradox in the Theory of Commercial Arbitration'. *Dispute Resolution Journal* 21(3), 156-163.
- Supreme Court Mediation Rules 2010** s3 s2.
- Symeonides S. C. (2014).** *Codifying Choice of Law Around the World: An International Comparative Analysis.* Oxford University Press.
- Tan E. K. B. (2007).** 'Harmony as Ideology Culture and Control: Alternative Dispute Resolution in Singapore'. *Australian Journal of Asian Law* 121-122.
- The Automatic Referral to Mediation Scheme:** A Critical Analysis. *Journal of Dispute Resolution* 27(2), 112-129.
- United Nations (2019).** *United Nations Convention on International Settlement Agreements Resulting from Mediation.* [online] Available at: <https://www.uncitral.org> [Accessed 11 August 2024].
- United Nations Commission on International Trade Law (1977).** *UNCITRAL Arbitration Rules.* New York: United Nations.

United Nations Commission on International Trade Law (1981). *UNCITRAL Conciliation Rules*. New York: United Nations.

United Nations Commission on International Trade Law (2018). *United Nations Convention on International Settlement Agreements Resulting from Mediation; Model Law on International Commercial Mediation and International Settlement Agreements Resulting from Mediation*. New York: United Nations.

United Nations Commission on International Trade Law (2021). *UNCITRAL Model Law on International Commercial Arbitration*. United Nations Commission on International Trade Law.

United Nations Commission on International Trade Law (2021). *UNCITRAL Notes on Mediation*. New York: United Nations.

White & Case LLP (2021). *Current Choices and Future Adaptations*. Retrieved from www.whitecase.com/insight-our-thinking/current-choices-and-future-adaptations.

Woolsey L. H. (1941). *Arbitration in Action*. New York and London: Harper & Bros.

World Intellectual Property Organization (WIPO) (n.d.). *WIPO Guide to Arbitration*. Available at: WIPO website (Accessed: 11 August 2024).

Health Care Scenario in India and Antecedents of Job Crafting of Doctors Working in Public and Private Sector in Kolhapur, India.

Mrs. Madhura K. Mane,
Assistant Professor, Chhatrapati Shahu
Institute of Business Education and
Research (CSIBER), Kolhapur, India

Dr. Reshma Kabugade,
Associate Professor, NBN Sinhgad School
of Management Studies, Pune, India

Abstract

Health care system that existing in any country is very vital for the well-being of its population. Before independence, the health care system in India was crippled. But after independence, the Governments realized the importance of availability of health care facilities to the citizens and since then taken various measures to build a robust health care system in the country. India is the most populated country in the world. Due to the vast population and changes in lifestyle, there is immense pressure on the health care system of India. The health care system of India consists of private and public sectors. Public sector consists of clinics and hospitals managed by Government while private sector is owned by private individuals. The most important constituent of health care machinery are doctors. It is well accepted that medical profession is one of the most stressful professions. Several reports have presented the challenges faced by doctors in their work life. Some of the challenges are faced by doctors working in public sector, while some are faced by doctors working in private sector. Past research studies have shown that doctors face a lot of pressure due to their demanding profession.

Studies have highlighted the high level of stress and burn-out among doctors which means that they will not be able to provide proper treatment to patients. It becomes necessary to think of interventions to mitigate the stress and burn out arising due to these work pressures, Job crafting is an employee-initiated action in which employees modify their jobs to better align it with their abilities, goals, motives and interests. Past research shows that Job crafting has positive impact on job attitudes and better work life balance. This in turn enhances the performance of individuals at work. As it is employee-initiated, proactive personality proves to be very important. Job characteristics may also influence the level of job crafting practiced by individuals. With positive outcomes of Job crafting, both private and public sector policy-makers can think of providing an environment to doctors that is conducive to job crafting of doctors.

Keywords: Health Care in India, Antecedents of Job Crafting, challenges of Doctors, Task Crafting, Relationship Crafting, Cognitive Crafting, Proactive Personality, Job Characteristics

Introduction

Healthcare is a crucial aspect that ensures the well-being of the population of a nation. India being the most populated country in the world with a total population of around 1.42 billion people; it is apparent that the responsibility and pressure on the health care machinery in India is immense. The health care system in India was crippled before independence. But after the independence of India, different Governments have made a conscious effort to formulate policies and take the necessary steps to ensure that there are adequate health care facilities for the citizens.

Some important health indicators in India like the life expectancy was approximately 69.7 years (WHO, 2021), while the Infant Mortality Rate (IMR) was 30 deaths per 1,000 live births (Sample Registration System, 2021). The Maternal Mortality Ratio (MMR) was 97 deaths per 100,000 live births (MoHFW, 2020). The Indian healthcare market was valued at approximately \$194 billion in 2020 and is projected to grow significantly in years to come (NITI Aayog, 2021).

Today, the health care system in India has evolved to be a complex system that is aimed at delivering health care to its vast and diverse population. The health care system can be divided into two sectors, public and private sector. Private sector of the health care system are all the establishments like clinics and hospitals that are privately owned and managed, while public sector includes the clinics and hospitals owned and managed by the Government.

Overview of Public and Private Health Care System in India:

The public health service in India is evolving, with significant investments and reforms aimed at addressing longstanding challenges. As far as the structure of public healthcare system is concerned, the Central Government's Ministry of Health and Family Welfare (MoHFW) is at the apex. The ministry is responsible to study the prevailing conditions in the country and formulate policies and design different programs to make the health care more robust in the entire country.

At the State level, there is a Health Department that implements public health initiatives on behalf of the State Government and also ensures proper implantation of Health programs developed by the MoHFW from time to time. At District level too, health care services are provided to the patients through a network of Unit Primary Health (UPHC), Primary Health Centers (PHCs), Rural Hospitals (RH), Sub-District Hospitals (SDH) and District Hospitals (DH).

The following table shows the number of UPHCs, PHCs, RH, SDHs and DHs in Kolhapur District:

Sr. No.	Type of Facility	No. in Kolhapur District
1	Unit Primary Health Centers	416
2	Primary Health Centers	74
3	Rural Hospitals	18
4	Sub-District Hospitals	4
5	Medical College, District Hospital	1

Source: Compiled by the researcher from <https://www.zpkolhapur.gov.in>, and <https://nrhm.maharashtra.gov.in/>

The Local administration bodies also play an important role in implementation of policies and programs of the Central and State Government by working at the grass root level. In Kolhapur, the Kolhapur Municipal Corporation manages 4 hospitals and 9 UPHCs and one Physiotherapy center in Kolhapur city. (Source: <https://web.kolhapurcorporation.gov.in/>)

Different programs are introduced by the Central and State Governments related to health care for the benefit of the people including the National Health Mission (NHM) that was launched in 2005. The NHM aimed at strengthening rural health infrastructure in the county that is to ensuring that healthcare services are available to all, especially in rural and underserved areas. Ayushman Bharat Scheme was another ambitious plan launched in 2018 to provide health insurance to low-income families. The scheme offers a health insurance cover of up to INR 5 lakh per family per year for secondary and tertiary care hospitalization. As of 2023, it has approximately 50 crores (500 million) beneficiaries, making it one of the world's largest health insurance schemes. The Integrated Child Development Services (ICDS) is a community-based program that focuses on health and of children health below 6 years of age and pregnant and nursing mothers. ICDS seeks to provide young children with an integrated package of services such as supplementary nutrition, health care and pre-school education. According to Government report, a population of the children covered by ICDS scheme in Maharashtra alone is about 86,31,910.

According to a report of the World Bank, the health sector in India has historically been underfunded, with health expenditure around 1.5% of GDP. The National Health Policy (NHP) 2017 aimed to increase public health expenditure to 2.5% of GDP by 2025. In the 2024 Union Budget of India, the Government allocated approximately INR 89,000 crores (about \$11 billion) for health and family welfare. To fulfill the health care demands of such a huge population is a herculean task. The most important element of the health care system is a doctor. As per reports of National Medical Council and Ministry of Health and Family Welfare in 2023, India has approximately 1.5 million registered doctors in India, including both allopathic and traditional medicine practitioners (such as Ayurveda and Homeopathy).

The Private Sector contributes significantly by augmenting the public sector in its mission of providing health care facilities to people. While it provides essential services and innovations, addressing challenges related to quality, affordability, and access remains crucial for achieving equitable healthcare for all citizens. The private sector includes hospitals, clinics, diagnostic centers, and pharmacies. It comprises both for-profit and not-for-profit organizations. These clinics and hospitals are privately owned and range from small nursing homes to large corporate hospitals. According to a report by NITI Aayog, the private sector accounts for about 74% of total healthcare expenditure in India. The private sector provides inpatient services as well as outpatient services. The private sector provides nearly 60% of all inpatient services and approximately 80% of outpatient consultations occur in the private sector. The private sector is also predominant in specialized care, including cardiology, orthopedics, and oncology. Moreover, reports show that nearly 60% of the hospital beds in India are

in the private sector (Source: National Health Systems Resource Centre). The growth of health insurance, especially with schemes like Ayushman Bharat, is increasing access to private healthcare.

As per the records of Kolhapur Municipal Corporation, there are 322 private hospitals functioning in Kolhapur city with total bed capacity of 6360 beds.

Literature Review:

It is universally accepted that medical profession is highly demanding and stressful. Maslach, C., & Leiter, M. P. (2016). Long working hours and high patient loads can lead to burnout and fatigue. Studies show that excessive workload is a significant contributor to stress among healthcare professionals. Lemaire, J. B., & Wallace, J. E. (2011). Doctors frequently deal with life-and-death situations, which can take an emotional toll. The pressure to make critical decisions can lead to heightened stress levels.

As per the study by Shanafelt, T. D., et al. (2016), increased bureaucracy and paperwork can detract from patient care time, contributing to feelings of frustration and stress among doctors. Dyrbye, L. N., et al. (2017) have concluded that balancing professional responsibilities with personal life can be challenging, leading to increased stress and decreased job satisfaction. A study by Shanafelt, T. D., et al. (2015) found that nearly 50% of physicians report feeling burned out, with high levels of stress impacting their mental health and job satisfaction. Research study conducted by Dyrbye, L. N., et al. (2014) indicates that emergency medicine and primary care physicians experience some of the highest levels of stress and burnout compared to other specialties.

Wrzesniewski, A., & Dutton, J. E. (2001). In their seminal paper "Crafting a Job: Revisioning Employees as Active Crafters of Their Work," the authors discuss how demographic factors such as age, gender, and work experience can influence job crafting behaviors. They suggest that individuals at different career stages or with varying life experiences may approach job crafting differently, highlighting the impact of demographic variables on how employees reshape their roles and responsibilities.

Berg, J. M., Dutton, J. E., & Wrzesniewski, A. (2013), in their study "What is Job Crafting?" have examined how demographic factors, including age and tenure, can influence job crafting behaviors. They argue that older employees or those with longer tenure may craft their jobs differently compared to younger or newer employees, as they may have more established roles and a clearer understanding of their work preferences. This review emphasizes the role of demographic characteristics in shaping the job crafting process.

Mane, M. and Kabugade, R. (2023) have conducted an extensive literature review to analyse the findings of past research work to know the relationship between demographic variables and Job Crafting behaviour. The authors have cited different papers and concluded that the findings of the studies on this topic are equivocal. Some studies have shown strong relationship between age, gender, experience while others have shown a weak relationship. Similarly, there have been examples of studies that have found that there is no relationship between demographic factors and Job Crafting.

Tims, M., Bakker, A. B., & Derks, D. (2013), in their study titled "The impact of personal resources on the job crafting process," discuss how proactive personality serves as a key personal resource that enhances individuals' ability to craft their jobs. They argue that individuals with a proactive personality are more likely to take initiative in modifying their work roles to improve job satisfaction and performance.

Bakker, A. B., & Demerouti, E. (2014), in their review "Job Crafting and Performance," highlight the role of proactive personality in job crafting behaviors. They discuss how employees with a proactive personality are more inclined to engage in job crafting, leading to improved work engagement and performance outcomes. Their work underscores the positive feedback loop between proactive personality traits and proactive job behaviors.

Berg, J. M., Dutton, J. E., & Wrzesniewski, A. (2008), in their conceptual paper "What is Job Crafting?" explore how job crafting behaviors can be influenced by personal characteristics, including proactive personality. They propose that individuals with a proactive disposition are more likely to reshape their job roles in meaningful ways, enhancing their work experience and satisfaction.

Petrou, P., Demerouti, E., & Schaufeli, W. B. (2016), in their article "Crafting the Change: The Role of Job Crafting in Organizational Change," explore various factors that influence job crafting behaviors during periods of organizational change. They suggest that while proactive personality might contribute to job crafting, other factors such as organizational support and change-related stressors can have a more pronounced effect on how employees engage in job crafting. This highlights that the relationship is not straightforward and may depend on situational factors.

Tims, M., Bakker, A. B., & Derks, D. (2013), in their article "The impact of job characteristics on job crafting," examine how specific job characteristics, such as autonomy, task variety, and feedback, influence employees' job crafting behaviors. They argue that when job characteristics are favorable, employees are more likely to engage in job crafting to enhance their work experience. The study highlights that job crafting is a proactive response to the job environment, enabling individuals to align their work with their strengths and interests.

Bakker, A. B., & Demerouti, E. (2007), in their comprehensive review "The Job Demands-Resources model: Challenges for future research," discuss how job characteristics serve as both demands and resources that influence job crafting behaviors. They posit that favorable job resources, such as social support and autonomy, encourage employees to actively craft their jobs to enhance their motivation and well-being. The Job Demands-Resources (JD-R) model underscores the importance of job characteristics in shaping proactive job behaviors.

Research studies uncovering the relationship between demographics, proactive personality and Job characteristics with Job Crafting were conducted in the past. But, the researcher did not come across any study based on doctors in India working in public and private sector. So, this research will address this gap and uncover relationship between demographics, proactive personality, job characteristics and Job Crafting of doctors in India.

Theoretical Underpinnings of Research:

Job Crafting is a comparatively new term coined in 2010 by Wrzesniewski and Dutton based on their research based on New York Hospital. Wrzesniewski & Dutton (2001) define Job crafting as "the physical and cognitive changes individuals make in their task or relational boundaries." This definition emphasizes the adjustments employees can make to their job tasks and relationships to create a more satisfying work experience. Bakker et al. (2012) defined Job crafting as "the self-initiated changes that employees make to their jobs to enhance their work engagement and job satisfaction." This definition highlights the voluntary aspect of job crafting as a means to boost engagement and satisfaction. Tims et al. (2013) defined job crafting as "the process by which employees modify their own jobs in order to improve their work experiences." This emphasizes the active role employees take in shaping their work environment.

Berg et al. (2010) define Job crafting as "the ways in which employees customize their work environments to meet their needs, which can lead to higher job satisfaction and performance."

This definition highlights the customization aspect of job crafting for personal fulfillment and effectiveness. Employees who are proactive try to align their interests, goals, abilities with their jobs by modifying certain aspects of their jobs. As per the original research by Wrzesniewski & Dutton (2001), employees can craft their jobs in three ways,

Task Crafting: Task crafting refers to the physical changes employees make to their job responsibilities and tasks. This could involve altering the nature, scope, or number of tasks in their job. The employees may add tasks like taking on additional responsibilities or projects that align with personal interests or strengths. Employees may modify tasks by changing the way tasks are performed to make them more engaging or manageable. In some cases, employees may craft their jobs by simply delegating tasks by shifting certain responsibilities to others to focus on more meaningful work. By modifying tasks, employees can enhance their job satisfaction and work engagement, leading to a more fulfilling work experience.

Relational Crafting: Relational crafting involves changes in the nature and quality of interactions with colleagues, clients, and supervisors. This type focuses on the social aspect of work. Employees may practice relationship crafting by building relationships by actively seeking to develop closer ties with coworkers or mentors. They may change the style of interaction at workplace by adjusting how one communicates or collaborates with others to create a more supportive environment. Relationship crafting also relates with networking initiatives taken by employees. It deals with how they engage with new stakeholders or communities to enrich one's professional relationships. Enhancing relationships at work can lead to greater support, improved teamwork, and a more positive work environment.

Cognitive Crafting: Cognitive crafting involves changing the way one perceives their job and its significance. This type focuses on mental adjustments and reframing how employees think about their work. Cognitive crafting includes reframing tasks by viewing tasks as opportunities for personal growth or contributions to a larger purpose. Employees find meaning in their work and identify how one's work positively impacts others or aligns with personal values. It also includes establishing personal objectives that add meaning to everyday tasks. By reshaping their perceptions, employees can cultivate a sense of purpose and motivation, leading to increased job satisfaction and resilience.

This, according to research has shown positive impact on job satisfaction, work engagement and organization commitment. All these positive effects further lead to enhancement of performance of employees at work place. There are different personality-related and contextual factors that impact the level of Job Crafting behavior among employees. Moreover, demographical factors like age, gender, experience also affect the Job Crafting behavior.

Research Design:

General Objective of the Research:

The aim of this research is to uncover the relationship between Job Crafting and demographical attributes like age, gender, experience, income, working sector, education, proactive personality and job characteristics of doctors working in private and public sector in Kolhapur.

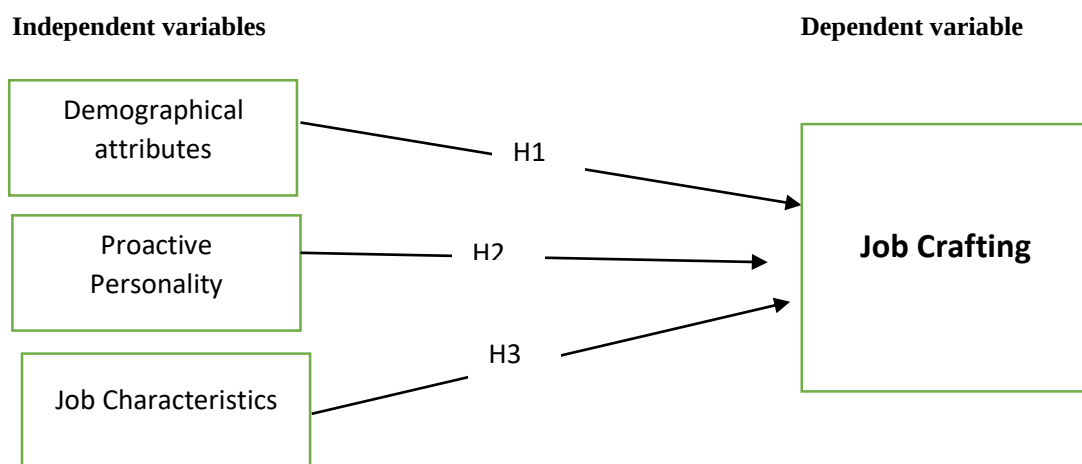
Research Questions:

1. What are some of the highlights of health care scenario in India?
2. What are the challenges faced by doctors working in both public and private sectors in India?
3. Is there relationship between demographic factors and level of Job crafting of doctors?
4. Is there any relationship between proactive personality and Job Crafting of doctors working in private and public sector?
5. Is there relationship between Job characteristics like skill variety, task significance and task identity, autonomy and feedback (Hackman and Oldham's model) and Job Crafting of doctors?

Research Objectives:

1. To study the indicators that shows the existing Health Care landscape in India.
2. To identify the challenges faced by doctors working in both, private and public sector.
3. To analyze the relationship between demographic attributes and Job Crafting of doctors.
4. To identify relationship between proactive personality and Job Crafting.
5. To identify if there is relationship between Job characteristics and Job Crafting.

Conceptual model:



Scope of the Study: The study is limited to doctors practicing in Kolhapur. The study focuses on the various factors that qualify as antecedents of Job Crafting.

Research Type: Mixed research type that is both quantitative and qualitative research design is used to accomplish the objectives of this study.

Sampling and Data Collection: As an updated and consolidated list of doctors practicing in Kolhapur is not available, the directory of members of Kolhapur Medical Association was used as reference to contact 150 doctors working in Public and Private sector in Kolhapur using convenience sampling method. A questionnaire was designed to collect demographic data, questions on proactive personality consisting of 17 items (Bateman, T. S., & Crant, J. M. (1993)) and Job characteristics scale consisting of 12 items (Suman & Srivastava, 2009). It was sent to 150 doctors, out of which 111 were returned. It was found that out of 111 responses, 07 responses were incomplete. Hence, 104 responses were considered for further analysis.

Data Analysis and Interpretation:

Challenges faced by doctors working in Public Sector in India:

- **Workforce shortages:** In many rural and semi-urban areas, there are insufficient doctors to meet the demands of the patients. This increases patient load on existing doctors.
- **Inadequate infrastructure:** Many public hospitals lack basic facilities such as adequate medical equipment, clean drinking water, and sanitation. According to data published on the Indian Public Health Standards (IPHS) dashboard, only approximately 20% of the assessed facilities achieved a score of 80% or higher, meeting the required benchmarks for infrastructure, human resources, drugs, diagnostics, and equipment.
- **Low Salaries and Compensation:** Many doctors in public service earn significantly less than their counterparts in the private sector. The average salary for a government doctor can be around INR 60,000-INR 80,000 per month, while private sector salaries can exceed INR 1 lakh easily, especially in urban areas. Low compensation can lead to dissatisfaction, prompting doctors to seek opportunities elsewhere or leave the profession.
- **High Work Pressure:** In public hospitals, doctors often work long hours, sometimes exceeding 60-80 hours a week. Reports indicate that doctors in government hospitals handle 30-50 patients per day.
- **Bureaucratic Challenges:** Doctors often face administrative hurdles in patient management due to bureaucratic processes. For instance, obtaining necessary approvals for medical procedures can be time-consuming and frustrating.
- **Limited Professional Development Opportunities:** Public sector doctors may have fewer opportunities for continuing education and professional development compared to their private sector counterparts. (NITI Aayog. (2021). World Health Organization (WHO). "Global Health Observatory Data.")

Challenges faced by doctors working in Private Sector in India:

- **High Workload and Long Hours:** Many private sector doctors work extended hours, often 60-80 hours a week, to manage patient loads and meet financial targets. For instance, a study published in the *Indian Journal of Community Medicine* noted that many specialists reported seeing 30-40 patients a day.
- **Financial Pressures:** Doctors often face pressures to meet revenue targets set by hospital management. This can lead to practices like unnecessary tests and treatments. Several research studies and newspapers have reported concerns about over-prescription in private hospitals due to financial incentives.
- **Regulatory Challenges:** The private healthcare sector is subject to complex regulations that can vary by state, making compliance difficult. For instance, the approval processes for new facilities or procedures can be cumbersome and time-consuming.
- **High Costs of Practice:** The cost of maintaining a private practice, including rent, equipment, and staff salaries, can be substantial. According to the *Economic Times*(February 2024), many doctors find it challenging to manage these costs effectively.
- **Competition and Market Saturation:** In urban areas, the density of healthcare providers leads to intense competition. For instance, a neighborhood might have multiple clinics and hospitals, making it challenging for individual practitioners to attract and retain patients.
- **Patient Expectations and Legal Risks:** Patients often have high expectations regarding outcomes and may resort to legal action if dissatisfied. A study in the *Indian Journal of Medical Ethics* pointed out the rising trend of litigation against doctors, leading to increased anxiety among practitioners.
- **Work-Life Balance:** The demands of private practice often result in poor work-life balance. Doctors may have to forgo personal time, impacting their mental health and family relationships.

All doctors face threat of violence and the safety of especially women doctors is a big concern.

Descriptive Statistics:

Gender of Respondent Doctors:

Gender wise distribution of the respondent doctors is presented in the following table

Gender	Frequency	Percent	Valid Percent	Cumulative %
Male	72	69.2	69.2	69.2
Female	32	30.8	30.8	100.0
Total	104	100.0	100.0	

The above shows the percentage of male and female respondents surveyed by the researcher. Here 72 (69.2%) were male respondent doctors and 32 (30.8%) were female respondent doctors. Women currently account for the majority of the workforce in the health sector. However, women continue to be underrepresented in highly skilled professions in the field of medicines when it comes to health personnel. The current collect data suggest male respondent doctors are more than double compare to the female respondent doctors.

Age-Wise Distribution Of Respondents:

Age wise distribution of the respondent doctors is presented in the following table

Age	Frequency	Percent	Valid Percent	Cumulative %
Below 20 years	7	6.7	6.7	6.7
20-30 years	62	59.6	59.6	66.3
30-40 years	27	26.0	26.0	92.3
Above 40 years	8	7.7	7.7	100.0
Total	104	100.0	100.0	

The above shows the age wise classification of respondents surveyed by the researcher. Here 62 (59.6%) respondent doctors are in the age group of 20 – 30 Years and 27 (26.0%) respondent doctors were in age group of 30 – 40 Years. Around 8 (7.7%) of the respondent doctors have age above 40 years. Most of the respondents were in age limit of 20 years to 40 years.

Marital Status of Respondents:

Marital Status	Frequency	Percent	Valid Percent	Cumulative %
Married	68	65.4	65.4	65.4
Unmarried	36	34.6	34.6	100.0
Total	104	100.0	100.0	

The above table depicts the marital status of respondent doctors. Total 68 (65.4%) respondent doctors were married and remaining 36 (34.6%) were unmarried.

Highest Qualification of respondents:

Qualification	Frequency	Percent	Valid Percent	Cumulative Percent
Bachelor of Medicine, Bachelor of Surgery (MBBS)	30	28.8	28.8	28.8
Bachelor of Dental Surgery (BDS)	11	10.6	10.6	39.4
Bachelor of Ayurvedic Medicine and Surgery (BAMS)	21	20.2	20.2	59.6
Bachelor of Homeopathic Medicine and Surgery (BHMS)	26	25.0	25.0	84.6
Doctor of Medicine (MD)	13	12.5	12.5	97.1
MS, DNB (specialist)	2	1.9	1.9	99.0
Others	1	1.0	1.0	100.0
Total	104	100.0	100.0	

In the above table, respondent doctors were asked about their highest qualification in the field of medicine. Out of total sample respondent doctors, around 30 (28.8%) respondent doctors have done Bachelor of Medicine, Bachelor of Surgery (MBBS), 26 (25.0%) have done Bachelor of Homeopathic Medicine and Surgery (BHMS), 21 (20.2%) have done Bachelor of Ayurvedic Medicine and Surgery (BAMS). Total 13 (12.5%) respondent doctors completed Doctor of Medicine (MD), 11 (10.6%) respondent doctors completed Bachelor of Dental Surgery (BDS), while total 3 (2.9%) have completed other courses including Gynecology, Oncology etc.. Majority of the doctors have Bachelor Degree.

Working Sector of Respondents:

Working Sector	Frequency	Percent	Valid Percent	Cumulative %
Private	63	60.6	60.6	60.6
Government	41	39.4	39.4	100.0
Total	104	100.0	100.0	

Above Table shows the division of respondent doctors as per their working sector. Total 63 (60.6%) respondent doctors were working in Private sector while total 41 (39.4%) respondent doctors were working in Government sector.

Income Per Month (Rs.) of Respondents:

Income Per Month Rs)	Frequency	Percent	Valid Percent	Cumulative %
Up To 25,000	7	6.7	6.7	6.7
25,001 To 50,000	8	7.7	7.7	14.4
50,001 To 75,000	29	27.9	27.9	42.3
75,001 To 1,00,000	58	55.8	55.8	98.1
More Than 1,00,000	2	1.9	1.9	100.0
Total	104	100.0	100.0	

Above table have shown the income of respondent doctors per month in rupees. Out of total respondent doctors, 58 (55.8%) doctors have their income in age of Rs.75,001 to Rs.1,00,000 per month. While total 29 (27.9%) doctors have their income in range of Rs.50,001 to Rs.75,000 per month. Total 7 (6.7%) doctors have their income up to Rs. 25,000 per month. Total 8 (7.7%) doctors have their income in range of Rs.25,001 to Rs.50,000 per month. only 2 (1.9%) of the doctors have income more than Rs.1,00,000 per month. Majority of the doctors are earning in the range of Rs. 50,001 to Rs. 1,00,000 per month.

Total Experience of Respondents:

Total Experience	Frequency	Percent	Valid Percent	Cumulative %
Up To 5 Years	22	21.2	21.2	21.2
6 Years To 10 Years	59	56.7	56.7	77.9
11 Years To 15 Years	19	18.3	18.3	96.2
More Than 15 Years	4	3.8	3.8	100.0
Total	104	100.0	100.0	

Above table depicted the total experience of the respondent doctors in year. Research has asked respondents about their total experience in the field of medicine after completion of education. Out of total respondent doctors, 59 (56.7%) of the doctors have experience in range of 6 years to 10 years. While 22 (21.2%) of respondent doctors have experience up to 5 years. Total 19 (18.3%) respondent doctors have experience in range of 11 years to 15 years and only 4 (3.8%) respondents have experience more than 15 Years.

Total Experience of Respondents in Current Organization:

Total Experience in Current Organization	Frequency	Percent	Valid Percent	Cumulative %
1 Year	12	11.5	11.5	11.5
2 Years	12	11.5	11.5	23.1
3 Years	15	14.4	14.4	37.5
4 Years	18	17.3	17.3	54.8
5 Years	18	17.3	17.3	72.1
More Than 6 Years	29	27.9	27.9	100.0
Total	104	100.0	100.0	

Here respondent doctors were asked about their total experience in current working organization. Results have shown that around 29 (27.9%) of the respondent doctors has experience more than 6 years in current organization. Total 12 (11.5%) have experience of 1 year and same number of respondent doctors have experience of 2 years. Total 15 (14.4%) of respondent doctors have experience of 3 Years and total 36 (34.6%) of respondents doctors have experience around 4 to 5 years.

Reliability Analysis:

Factors affecting Job Crafting		
Sr. No.	Name of Scale	Cronbach Alpha
1	Proactive Personality	0.754
2	Demographic Factors	0.701
3	Job Characteristics	0.719
4	Job Crafting	0.755

The internal consistency of the tools used in research was assessed using Cronbach's alpha. A reliability test termed Cronbach Alpha is used in SPSS to evaluate the internal consistency, or dependability, of the measuring tool (questionnaire). It is most frequently used to assess whether or not the Likert scale is dependable when the questionnaire is constructed utilizing many Likert scale assertions. The internal consistencies obtained were at an acceptable level of above 0.7 for antecedents of Job Crafting (ranging from 0.722 to 0.755).

On the basis of the objectives, following hypothesis was formulated;

H₀: There is a significant relationship between demographic factors and job crafting of doctors working private hospital.

H₁: There is a significant relationship between demographic factors and job crafting of doctors working government hospital.

Table 1. Hypothesis Testing (Private Sector)

Null Hypothesis	Alternative Hypothesis	Spearman Correlation	Sig. Value	Result
There is no significant relationship between demographic factors and job crafting of doctors working private hospital.	There is a significant relationship between demographic factors and job crafting of doctors working private hospital.	0.781	0.021	Reject Null Hypothesis
There is no significant relationship between Age and job crafting of doctors working private hospital.	There is a significant relationship between Age and job crafting of doctors working private hospital..	0.694	0.001	Reject Null Hypothesis
There is no significant relationship between Gender and job crafting of doctors working private hospital.	There is a significant relationship between Gender and job crafting of doctors working private hospital..	0.720	0.000	Reject Null Hypothesis
Null Hypothesis	Alternative Hypothesis	Spearman	Sig.	Result

		Correlation	Value	
There is no significant relationship between Marital Status and job crafting of doctors working private hospital.	There is a significant relationship between Marital Status and job crafting of doctors working private hospital..	0.685	0.038	Reject Null Hypothesis
There is no significant relationship between working sector and job crafting of doctors working private hospital.	There is a significant relationship between working sector and job crafting of doctors working private hospital..	0.725	0.001	Reject Null Hypothesis
There is no significant relationship between qualification and job crafting of doctors working private hospital.	There is a significant relationship between qualification and job crafting of doctors working private hospital..	0.628	0.011	Reject Null Hypothesis
There is no significant relationship between total experience and job crafting of doctors working public hospital.	There is a significant relationship between total experience and job crafting of doctors working public hospital..	0.631	0.001	Reject Null Hypothesis
There is no significant relationship between total experience in current organization and job crafting of doctors working private hospital.	There is a significant relationship between experience in current organization and job crafting of doctors working private hospital..	0.728	0.000	Reject Null Hypothesis
There is no significant relationship between income per month and job crafting of doctors working private hospital.	There is a significant relationship between income per month and job crafting of doctors working private hospital..	0.597	0.042	Reject Null Hypothesis

Table 2. Hypothesis Testing (Public Sector)

Null Hypothesis	Alternative Hypothesis	Spearman Correlation	Sig. Value	Result
There is no significant relationship between demographic factors and job crafting of doctors working public hospital.	There is a significant relationship between demographic factors and job crafting of doctors working public hospital..	0.635	0.003	Reject Null Hypothesis
There is no significant relationship between Age and job crafting of doctors working public hospital.	There is a significant relationship between Age and job crafting of doctors working public hospital..	0.651	0.001	Reject Null Hypothesis
There is no significant relationship between Gender and job crafting of doctors working public hospital.	There is a significant relationship between Gender and job crafting of doctors working public hospital..	0.788	0.000	Reject Null Hypothesis
There is no significant relationship between Marital Status and job crafting of doctors working public hospital.	There is a significant relationship between Marital Status and job crafting of doctors working public hospital..	0.587	0.001	Reject Null Hypothesis
There is no significant relationship between working sector and job crafting of doctors working public hospital.	There is a significant relationship between working sector and job crafting of doctors working public hospital..	0.753	0.000	Reject Null Hypothesis

Null Hypothesis	Alternative Hypothesis	Spearman Correlation	Sig. Value	Result
There is no significant relationship between qualification and job crafting of doctors working public hospital.	There is a significant relationship between qualification and job crafting of doctors working public hospital..	0.655	0.001	Reject Null Hypothesis
There is no significant relationship between total experience and job crafting of doctors working public hospital.	There is a significant relationship between total experience and job crafting of doctors working public hospital..	0.630	0.001	Reject Null Hypothesis
There is no significant relationship between total experience in current organization and job crafting of doctors working public hospital.	There is a significant relationship between experience in current organization and job crafting of doctors working public hospital.	0.726	0.000	Reject Null Hypothesis
There is no significant relationship between income per month and job crafting of doctors working public hospital.	There is a significant relationship between income per month and job crafting of doctors working public hospital..	0.531	0.040	Reject Null Hypothesis

Above table shows the Spearman rank correlation between demographic factors and job crafting parameters of doctors in both private sector and the public sector. Results depict that there is strong correlation (0.781) in between demographic factors and job crafting of private hospital doctors at significance level less than 0.05. While there is a moderate correlation (0.635) in case of doctors working in the public sector at a significance level less than 0.05. Results have depicted that in case of private sector doctors, there is a strong correlation of gender (0.720) working sector (0.725) and experience in current organization (0.778) with job crafting factors. While, there is the moderate correlation of age (0.694), marital status (0.685), qualification (0.628), total experience (0.631) and income per month (0.597) with job crafting. Similarly, in case of public sector doctors, there is a strong correlation of gender (0.788) working sector (0.753) and experience in a current organization (0.726) with job crafting. While, there is a moderate correlation of age (0.651), marital status (0.587), qualification (0.655), total experience (0.630), and income per month (0.531) with job crafting. From this analysis, it can be concluded that there demographic factors have some association with job crafting, but it has more influence on doctors working private sector than doctors working public sector.

Relationship between Proactive Personality and Job Characteristics with Job Crafting:

Null Hypothesis	Alternative Hypothesis	Spearman Correlation	Sig. Value	Result
There is no significant relationship between proactive personality and job crafting of doctors working private hospital.	There is significant relationship between proactive personality and job crafting of doctors working private hospital.	0.758	0.034	Reject Null Hypothesis
There is no significant relationship between job characteristics and job crafting of doctors working private hospital.	There is significant relationship between job characteristics and job crafting of doctors working private hospital.	0.681	0.001	Reject Null Hypothesis
There is no significant relationship between proactive personality and job crafting of doctors working public hospital.	There is significant relationship between proactive personality and job crafting of doctors working public hospital.	0.655	0.001	Reject Null Hypothesis

Null Hypothesis	Alternative Hypothesis	Spearman Correlation	Sig. Value	Result
There is no significant relationship between job characteristics and job crafting of doctors working public hospital.	There is significant relationship between job characteristics and job crafting of doctors working public hospital.	0.608	0.001	Reject Null Hypothesis

As is seen from the above table, there is strong relationship between proactive personality and Job crafting and also Job characteristics and Job crafting of both public and private sector doctors.

Conclusion:

The concept of Job Crafting has rightfully garnered attention in recent years due to the positive outcomes of Job crafting on performance, satisfaction, engagement and work life balance of individuals. As medical profession is undoubtedly one of the most stressful professions, it is important for doctors to think of different interventions to lessen, if not completely prevent stress and burnout. Job Crafting can be one such intervention in which doctors can curate their jobs to better align it with their personal abilities, motives, interests and goals in life. This will enhance positive job attitudes, performance and better work life balance of doctors at work that is crucial for saving millions of lives in the world.

Scope for Further Study:

The role of medical practitioners or doctors is extremely important in any society. Continued focus on improving infrastructure, access, and quality of care will be essential for enhancing health outcomes across the country. Further in-depth analysis in to the antecedents of Job Crafting can be done to understand how a work environment that is conducive to Job Crafting can be provided to doctors to enable them to enhance their performance, satisfaction, engagement and commitment to their work. A comparative study of Job Crafting of doctors and its outcomes practicing different medical systems like allopath, homeopathy, Ayurveda, Unani etc. would be interesting. Studying opinions of patients of doctors practicing and not practicing Job Crafting will add new insights. As job Crafting is initiated by individuals and not the management, research can be done on what initiatives management or Government can take in public sector to introduce Job Crafting as an intervention to enable doctors to align their personal goals, interest and abilities with their jobs to leverage the positive outcomes of Job Crafting.

Recommendations:

Management of hospitals, public or private must seriously think of providing flexible work arrangements, like flexible timings, telemedicine and part-time work to empower doctors to use their time more effectively and craft jobs. More autonomy in decision-making should be provided to doctors to encourage them to craft their jobs and make them more fulfilling. Management of hospitals must cultivate a supportive culture where peers support each other and collaborate with each other on different projects and activities. The Government as well as management of private hospitals must provide professional development opportunities to doctors to enable them to explore new areas of interest within their field. Supporting their desire to learn and grow can enhance positive perception that is cognitive crafting as well as ignite their minds about how they can engage in task and relationship crafting. This in turn will lead to increased engagement, satisfaction, work life balance and hence performance of doctors.

References:

- Bakker, A. B., & Demerouti, E. (2007).** The Job Demands-Resources model: Challenges for future research. *Journal of Occupational Health Psychology*, 12(2), 100-112. DOI: 10.1037/1076-8998.12.2.100
- Bakker, A. B., & Demerouti, E. (2014).** Job crafting and performance. *Current Directions in Psychological Science*, 23(1), 12-16. DOI: 10.1177/0963721413501969
- Bakker, A. B., Tims, M., & Derks, D. (2012).** Proactive Personality and Job Crafting: The Role of Job Resources. *Journal of Managerial Psychology*, 27(3), 276-289.
- Berg, J. M., Dutton, J. E., & Wrzesniewski, A. (2008).** What is job crafting? *The Oxford Handbook of Positive Organizational Scholarship*. DOI: 10.1093/oxfordhb/9780199734610.013.0026
- Berg, J. M., Dutton, J. E., & Wrzesniewski, A. (2010).** What Is Job Crafting and Why Does It Matter? *The Handbook of Positive Organizational Scholarship*.
- Berg, J. M., Dutton, J. E., & Wrzesniewski, A. (2013).** What is job crafting? *The Oxford Handbook of Positive Organizational Scholarship*. DOI: 10.1093/oxfordhb/9780199734610.013.0026
- Dyrbye, L. N., et al. (2014).** Burnout and Satisfaction with Work-Life Balance Among US Physicians Relative to the General US Working Population. *Archives of Internal Medicine*, 172(18), 1377-1385.
- Dyrbye, L. N., et al. (2017).** Burnout and Satisfaction with Work-Life Integration Among US Physicians Relative to the General US Working Population. *Academic Medicine*, 92(9), 1214-1220.
- Economic Times**, "Private hospitals say standardising rates will be catastrophic for sector", published on 29 February 2024.
- <https://nhm.gov.in/index1.php?lang=1&level=2&sublinkid=971&lid=154>
- <https://nhsrcindia.org/search/node?keys=infrastructure>
- Indian Journal of Community Medicine. (2019).** "The Burden of Workload on Private Practitioners in India." [Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6884891/>]
- Jindal, R.P., 2014.** The truth about medical negligence. *Indian Journal of Medical Ethics*, 11(1), pp.42-46.
- Lemaire, J. B., & Wallace, J. E. (2011).** Burnout among Physicians: A Review. *CMAJ*, 183(3), E166-E173.
- Maharashtra State Government Health Department.** Statistics on healthcare professionals.
- Mane M., Kabugade R. (2023)** Relationship Between Demographics And Job Crafting Behaviour Of Individuals. , *Madhya Pradesh Journal of Social Sciences*, A biannually Journal of M. P. Institute of Social Science Research, Ujjain ISSN: 0973-855X (Vol 28 No. 2(vii), December 2023).
- Maslach, C., & Leiter, M. P. (2016).** *Burnout: A Guide to Identifying Burnout and Pathways to Recovery*. Harvard Business Review Press.
- Ministry of Health and Family Welfare, Government of India. (2020).** National Family Health Survey (NFHS-5) [Link: <http://rchiips.org/nfhs/nfhs-5.shtml>].
- NITI Aayog. (2021).** "Health Systems for a New India: Building Blocks." [Link: https://niti.gov.in/writereaddata/files/document_publication/Health%20System%20for%20a%20New%20India%20-%20Building%20Blocks.pdf].
- Petrou, P., Demerouti, E., & Schaufeli, W. B. (2016).** Crafting the change: The role of job crafting in organizational change. *Journal of Change Management*, 16(2), 140-157. DOI: 10.1080/14697017.2015.1101814
- Shanafelt, T. D., et al. (2015).** Association of Physician Burnout with Suicidal Ideation and Professional Ratings of Care Quality. *Archives of Internal Medicine*, 172(20), 1599-1606.

- Shanafelt, T. D., et al. (2016).** Changes in Burnout and Satisfaction with Work-Life Integration in Physicians. *Journal of the American Medical Association Internal Medicine*, 176(9), 1284-1290.
- Subramani, S., (2017).** Patient autonomy within real or valid consent: Samira Kohli's case. *Indian Journal of Medical Ethics*, 2(3), pp.184-189.
- Tims, M., Bakker, A. B., & Derks, D. (2013).** The Impact of Job Crafting on Job Demands and Job Resources. *Journal of Managerial Psychology*, 28(5), 510-527.
- Tims, M., Bakker, A. B., & Derks, D. (2013).** The impact of personal resources on the job crafting process. *Journal of Vocational Behavior*, 83(3), 460-470.DOI: 10.1016/j.jvb.2013.06.008.
- World Bank. (2020).** "Health expenditure, total (% of GDP)." [Link: <https://data.worldbank.org/indicator/SH.XPD.TOTL.ZS>].
- World Health Organization. (2021).** World Health Statistics 2021 [Link: <https://www.who.int/data/gho/publications/world-health-statistics>].
- Wrzesniewski, A., & Dutton, J. E. (2001).** Crafting a Job: Revisioning Employees as Active Crafters of Their Work. *Academy of Management Review*, 26(2), 179-201.

An Analysis of the Challenges Faced by Small and Medium Enterprises in Mauritius

Y. Sunecher

University of
Technology
Mauritius

N. Ramphul

University of
Technology
Mauritius

H. Chitto

University of
Technology
Mauritius

F. Udhin

University of
Technology
Mauritius

Abstract

This research paper seeks to analyse the contribution of Small and Medium Enterprises to the Mauritian economy. There are around 125,500 SMEs operating in different business sectors in our economy. The Ministry of Business, Enterprise and Cooperatives of Mauritius launched a ten-year plan in 2016 for the Small and Medium Enterprises to boost up economic growth and development. In this research paper, the challenges faced by most Mauritian entrepreneurs in the Small and Medium Enterprise sector are discussed and analysed. The objective was to examine and study the motive to join an entrepreneurial undertaking by Mauritian entrepreneurs and the obstacles they faced in order to assess the efficiency of Mauritius support institutions and the position of entrepreneurial support needs. A survey was carried out in this research which ultimately reveals that entrepreneurs have faced different obstacles over their entire business life. Entrepreneurs are faced with challenges at every step of their career, and they require formal and informal help to operate their business smoothly. Primary data has been used mostly to find out the solution to the research problems. Random sampling has been used for probability sampling and the convenience method has been used for non-probability sampling due to a small number of respondents. The analysis of the research findings was used through descriptive statistics to present the data collected in charts to make easy comparison and analyse trends and patterns. There were several hypothesis being made to analyze the level of significance of entrepreneurs and the level of satisfaction with the government schemes being put in place. The implications found in the research shows how most of the entrepreneur have responded to the crisis period like COVID 19 which has caused major challenges to the Small and Medium Enterprise operating in Mauritius and help them choose the right business and make the right decision.

Keywords: Small and Medium Enterprises; Digital Technology; COVID-19; Government Scheme; Entrepreneurs

Introduction

Small and Medium Enterprises (SMEs) are a key vehicle for development and growth in any economy, as they constitute the majority of enterprises found even in the most industrialised countries (Storey, 1994). SMEs create employment, a source of innovation, generating export opportunities among other. In Mauritius, the contribution of the small scale sector in accelerating the economic development process and the democratisation of the economy is widely recognised. SMEs in Mauritius have experienced a rapid increase, especially with the government encouraging people to set up their own business by providing them with incentives, guidance and financial aid in their projects. The Government is committed to providing the conducive environment for the sustainable development of the sector and to respond to the changing needs of enterprises in a proactive manner. Over the years a number of incentives have been introduced to foster the development of the sector.

Entrepreneurship barriers can be failure factors if these are not overcome or managed effectively.

Entrepreneurship is considered to be a critical component of social and economic development. To promote entrepreneurship, we need to be firstly aware of the barriers affecting entrepreneurship to be able to overcome them. As SMEs play a significant role in the socio economic development of a country, governments strive to provide the right ecosystem for their growth both at the national and international level. Due to the COVID-19 pandemic, SMEs around the world are at a critical point of their survival. This largest public health crisis has led to a major economic crisis that has halted production in many countries and reduced consumption and confidence among SMEs' owners.

A study conducted by the International Labour Organisation (ILO) (2020) among 1,000 companies surveyed from eight countries across four continents revealed that 70% of them have had to shut down operations, half (50%) have temporarily closed their business by following direct instructions from the authorities, while the other 50% have closed temporarily due to a reduction in orders or cases of staff COVID-19 infection.

Furthermore, the World Bank (2020) reports that the Sub-Saharan region is the worst hit economically with 2020 growth forecasted to fall to between -2.1% to -5.1% coming from a low growth 2.5% in 2019. This forecast implies small scale businesses in the Sub-Saharan economies will be negatively affected (Mukosa, et al., 2020). Mauritius as an island state has also not been spared by the global pandemic. During the lock down period (March-May 2020), most of the businesses have suffered economic losses due to a sharp decrease in business activities.

These businesses are more vulnerable since they depend a lot on countries affected by COVID-19 such as Europe and the United States (US). As the country is likely to contract by 13%, SMEs which contribute to 40% of the country's GDP and 54.6% of total employment will be severely hit. As the COVID-19 pandemic is daunting the survival and internationalisation of SMEs due to various sanitary measures and international movement protocols, this article intends to suggest ways to help SMEs overcome local and international challenges in the midst of the COVID-19 pandemic.

Moreover, it is imperative that these enterprises are able to adapt to the new normal when international demand resumes. It responds to the call from the Organisation for Economic Cooperation Development (OECD) for an inventory of policy responses to foster SMEs' resilience in the post COVID-19 situation. A review of the existing policies adopted by different countries to support SMEs in the COVID-19 context will serve as guide in building resilience of local SMEs to the global pandemic now and in the post-pandemic context.

The growing number of publications on SMEs over the years demonstrates that it is a field that has gained the attention of the academicians and researchers. Existing literature on SMEs covers different issues such as the growth strategies, the internationalisation of SMEs (Morais, & Ferreira 2020) and the factors affecting the international growth of these businesses (Rahman & Mendy, 2019).

However, the unprecedented COVID-19 global pandemic being a game changer calls for a completely different approach to build the resilience of SMEs. There is an investigation into the challenges that Mauritian SMEs are faced with in the midst of the COVID-19 pandemic and how these challenges can be managed in 2020 and beyond.

The research objectives for this paper are set as follows:

- To identify the characteristics of entrepreneurs in Mauritius
- To inquire on the motivation of individuals to start an entrepreneurial career
- To explore the barriers faced by entrepreneurs
- To assess the effectiveness of support institutions
- To explore the support needs of entrepreneurs

LITERATURE REVIEW

Entrepreneurship

Foss and Klein (2012), the authors of the book 'Organising Entrepreneurial Judgement - A new approach to the firms' argue that there is still much work to be done in defining the term entrepreneurship. They explain that in the economies as well as the strategic management literature, a rational understanding has been crowded out by neoclassical economy with its theories of perfect competition and production functions which treat the firm as acting according to a predetermined way.

Concepts of Entrepreneurship

Foss and Klein (2012) have explored 7 different concepts of entrepreneurship in an attempt to connect them with the firm. The seven approaches are:

Entrepreneurship as Small Business Management

In this approach, entrepreneurship is strictly linked with firms that are qualified as a small business. Foss and Klein (2012) state that "it considers 'entrepreneurial' virtually all aspects of small or new business management while excluding the identical tasks when performed within a large or established business".

Entrepreneurship as charismatic leadership

This concept is brought forward by Max Weber. Here, entrepreneurship is defined as "the ability to articulate a plan, a set of rules, or a broader vision and impose it on others". This implies that entrepreneurs must have excellent communications skills and be able to generate as going concern to be successful (Foss and Klein 2012).

Entrepreneurship as judgement

This is the view that Foss and Klein (2012) have adopted. Here, entrepreneurship is defined as "judgemental decision making under the confidence of opportunity". Judgement is defined as "decisive action about the deployment of economic resources when outcomes cannot be predicted according to known probabilities". In this concept, the entrepreneur is an active and creative agent. He creates new opportunities by his judgement (Foss and Klein 2012).

Characteristics of entrepreneurs

Researchers have concluded that successful entrepreneurs possess common personality characteristics or traits. By focusing on personality traits. The Psychological Characteristics School of Entrepreneurship concluded that entrepreneurs possess unique values and attitudes towards work and life. Thus the number of potential entrepreneurs is finite as they have much courage and a set of characteristics that others do not possess and which demark them as special and successful entrepreneurs.

Below are the main characteristics which are associated with entrepreneurs.

❖ McClelland (1961, 1985) suggested that achievement, motivation, risk-taking and focus on control are the most important personality traits of the entrepreneur. The five core traits of entrepreneurs are:

- (1) Self-confidence
- (2) Risk-taking activity
- (3) Flexibility
- (4) Need for achievement#
- (5) Strong desire to be independent (Deakins and Freel, 2009)

Deakins and Freel (2009) stated that the characteristics that are meant to be special to successful entrepreneurs are the common abilities and skills that are applied to most successful managers.

Motivation

Individuals have various motivations to build an entrepreneurial career. Various studies have been conducted to analyse the driving reasons which motivate people to start a business. These reasons and motives can be classified as an opportunity or necessity, a distinction akin to 'pull' and 'push' factors (Hakim, 1989; McClelland et al 2005).

Motivation factors

The common motivation factors that drive for entrepreneurship are:

"Be my boss": seeks autonomy, independence and freedom from boundaries

The desire for independence (for example, autonomy and to have greater control) is often viewed as the first motivational factor of becoming an entrepreneur (Alstete 2003). Independence motivational factor is classified as a pull factor. However, in countries where independence forms part of the national culture, the responsibility that an individual has to manage his own life is strongly emphasized (for e.g, the USA).

Self-achievement and satisfaction

Setting their own business can bring a lot of satisfaction and a deep sense of achievement for these persons, they choose entrepreneurial career because they want to "do good". They gain social status as they are often described as social entrepreneurs. Social entrepreneurs concentrate more on the well-being of the community, region, or countries rather than running their business and profit wealth as the primary goal. These social entrepreneurs who emphasize on providing goods and services which are related to environmental sustainability are considered to be eco-friendly and needed (Kirkwood, 2009).

Barriers faced by entrepreneurs

Entrepreneurship is a very significant aspect in the development of the economy as well as social development. To recognise a need and to have an idea to satisfy it is not a strong basis enough to start an entrepreneurial career. Successful entrepreneur creates a business plan to attain business goals. However, before writing up the business plan, the entrepreneur must be aware of the entry barriers to be able to promote entrepreneurship by overcoming them.

Barriers are not the same for all entrepreneurs although some obstacles are common. Barriers to entrepreneurship depend on the industry sector, region and the type of enterprise.

Barriers to entrepreneurship are as follows:

Financial constraints

According to Bartik et al. (2020), access to finance is very crucial for businesses in achieving their objectives, especially start-up businesses and those seeking to invest and grow. It is difficult to obtain finance at a reasonable cost. SMEs depend much on external sources of finance, thus facing barriers in the market, preventing them to raise finance even higher for further innovation in high technology. Some people who do not have bank credit face various difficulties in getting loans as the risk for banks is higher. Also, interest rates and transactions costs are not convenient for them. Coupled with the above, in view of the inability to repay financial obligations due to banks on time particularly during the Covid-19 period whereby it was considered best to give deferral payment facility, most credit institutions did not want to engage themselves with high risk borrowers. Hence, it became even more challenging for start-up entrepreneurs, who are considered as high risk borrowers, to secure finance to sustain/start their business.

Lack of knowledge

A certain number of entrepreneurs fail after start-up, the reason being lack of general business know-how. Throughout the phase of doing business, entrepreneurs may face difficulties like:

- Lack of technical skill which can be in terms of operation management, dealing with the design and management of products, processes, services and supply chains.
- Lack of management skill such as:
 - inability to take right decisions at the right time;
 - inefficiency in controlling resources;
 - human resources management which is concerned with tasks like recruiting, managing, training, developing and rewarding people within the organisation;
 - financial management which deals with book-keeping, working capital management and the analysis of financial statements;
 - marketing management skill which is about managing the marketing process, for example, research, segmentation, targeting, and positioning marketing mix, implementation and control;
 - the monitoring and updating of business plan which is essential to prove its effectiveness; and
 - managing technology is concerned about the adoption of new technologies and innovation and implementing an e-business infrastructure. For example, integrating software platforms.

Cultural and social barriers

To set up an enterprise is very difficult as it requires knowledge of the legislative environment, market institutions etc. To establish an enterprise in a country or region, entrepreneurs need to know well the language and culture for better running of a business.

The lack of information about available institutions is also a barrier to entrepreneurs as they lack information about the role, services, mission and support institutions.

Limited access to social and business networks and institutions can prove to be an obstacle to business creation.

Legal and Political barrier

When creating a business, entrepreneurs have to conform to legal requirements. It also includes a range of supportive policies requirements that are, fiscal and monetary policies which are essential to provide a stable macro environment and also structural policies. Regulatory and administrative burdens can affect entrepreneurial activity. Legal entry and exit barriers should be avoided. Deakins and Freed (2009) mention that government intervention can cause great impact to entrepreneurial businesses in terms of changes in regulation, interest rates, labour markets or tax laws.

Barriers in disadvantaged groups or areas

❖ Female entrepreneurship

According to Langowitz and Minniti (2007), female business start-ups are considerably lower than that of males throughout the world.

Some common factors which represent barriers for women enterprises through their career are:

- Type of education
- Lack of appropriate business support
- Access to finance

- The impact of domestic responsibilities
- Lack of appropriate role model in entrepreneurship
- Low levels of confidence and self-esteem

❖ **Young**

It has been analysed that high levels of unemployment among youngsters had led to an increase in the choice of building in an entrepreneurial career, as a mean to find the way out of social exclusion. Nowadays, the potential of young people for starting entrepreneur career and for the promotion of economic growth, is being recognised.

However, they encounter specific problems related to their youth which are:

- Lack of capital
- Underdeveloped skills in business management
- Limited market contacts
- Lack of assistance from support institutions due to outdated attitudes.

❖ **Rural Areas**

Rural entrepreneurship is different and unique because of economic conditions in rural regions as well as the characteristics of rural entrepreneurs. The common barriers faced by rural entrepreneurs are as follows:

- A culture that is not supported for entrepreneurial activity
- Greater distances for markets and manufactures or producers and limited connections to urban markets
- Difficulties in achieving economies of scale due to small size and low market demand
- Difficulties in obtaining sufficient capital
- Lack of economic diversity
- Lack of other entrepreneurs and networks
- Difficulty in obtaining skilled labour
- Absence of industry clusters

Empirical Review of SME in Mauritius

□ **Global COVID-19 Pandemic**

The new type of corona virus (COVID-19) which was first detected in Wuhan City, Hubei Province of China in December 2019 has expanded to touch every corner of the globe. On top of affecting the public health with over 69 million cases diagnosed globally and more than 1.5 million fatalities, the new corona virus has also impacted nearly all businesses worldwide. According to Donthu & Gustafsson (2020), the COVID-19 outbreak has had severe economic consequences on many countries across the globe. For example, this largest public health crisis has halted production in affected countries, led to a collapse in consumption and confidence, and a negative response on stock exchanges which are responding negatively to heightened uncertainties (OECD, 2020). It has put a lot of pressure on Government to boost healthcare systems, secure businesses, maintain jobs and education, and stabilise financial markets and economies.

The COVID-19 pandemic has also impacted global trade which dropped significantly following the lock down and subsequent prohibitive sanitary measures imposed by different countries. By far, the travel and tourism industry has been one of the mostly hit industries. According to the World Tourism Organisation, the international tourist arrivals will drop 60%-80% in 2020 from 2019. This decline will seriously affect the small island states such as Mauritius that mostly depends on travel exports. The tourist industry remains an important pillar of the Mauritian economy by generating income of Rs 63 billion and creating 40,000 direct and indirect jobs.

The situation is more alarming for SMEs as they are resource constrained to adapt to a changing context. 4467 SMEs in 132 countries revealed that 55 % of the respondents were strongly affected by the global pandemic and one-fifth of them were on the verge of closing down their operations permanently in the near future. In Mauritius, on top of being economically affected by the lock down, SMEs are facing problems to import raw materials due to the international supply chain disruption by COVID-19. Given the socio economic costs associated with the global pandemic, many studies have been carried out to address some of the pandemic-related issues affecting society and business at large. For example, since the outbreak of the pandemic several papers have been published which cover different industry sectors (e.g., tourism, retail, and higher education), changes in consumer behaviour and businesses, ethical issues, and aspects related to employees and leadership (Donthu &

Gustafsson, 2020).

□ **Impact of COVID 19 on SMEs**

SMEs, by virtue of their size, face lot difficulties to ensure their survival and growth as well as to engage in international markets. It is an undeniable fact that SMEs are more vulnerable to global economic crisis caused by the COVID 19 global pandemic. Drawing from the experience of the 2008 economic crisis, SMEs are more likely face similar challenges such as closures, downsizing, and reduced the number of new ventures (Chowdhury 2011; Sannajust 2014).

Another study by Ratnasingam et al. (2020) among 748 Malaysian SMEs showed that these businesses were faced with tight financial management and supply chain disruptions. Furthermore, a qualitative study conducted by Nyanga & Zirima (2020) among Zimbabwean SMEs indicated that SMEs were negatively affected by the lockdown due to discontinued production. In a similar vein, results of a survey carried out by Bartik, et al. (2020) on over 5800 small businesses in the United States revealed that 43% of responding businesses were closed due restrictive cash flows. On a global basis, a survey conducted by the International Trade Centre (ITC) (2020) among SMEs in 132 countries showed that the global pandemic strongly affected the business operations of two-thirds of micro and small firms.

The main impacts of COVID 19 global pandemic on the performance of SMEs in the local and international contexts are summarised in the following paragraphs.

□ **Lower Revenue for SMEs**

Due to the movement control, lockdown, confinement and social distancing amongst other measures, SMEs' revenue from both the local and international markets have significantly decreased. According to ILO (2020), out of 1,000 companies, 75% of them has been suffering from reduced demand and one-third (33%) experiencing a more than 50% drop in customer orders. From the lock down period till date SMEs in Mauritius have been under extreme pressures and experienced devastating decrease in demand and revenues. According to MCB Focus (2020), the economy will contract by 14.3 % this year. This contraction implies huge financial challenges for the SME sector. As the global economy is also projected to contract by 4.4% this year, many local SMEs will face a lot of difficulties to secure international markets. Moreover, the control at the borders level will increase the transaction costs.

□ **SMEs' Cash Flow Shortages**

As the economic situation worsens, many firms will be faced with cash flow shortages to honour their financial obligations. According to Wehinger (2014), SMEs are more vulnerable to an economic crisis due low equity reserves, limited adaptation potential and flexibility for downsizing, liquidation problems, too much dependency on external financial resources, tightened credit lines, payment delays on receivables and lack of resources amongst others.

Measures to Mitigate the Impact of COVID-19 on SMEs

Recognising that SMEs face a bigger risk than larger firms of collapsing or being unable to compete, most governments have taken steps to assist SMEs in the midst and post COVID-19 era. Most of the support comes in the form of tax waivers, temporary tax relief, wage assistance scheme and other financial programmes.

For example, in Korea, an emergency fund has been established to provide direct financial support to SMEs and self-employed while in Portugal payments on all contributions by self-employed people have been deferred (OECD, 2020).

Other countries such as Belgium are supporting SMEs in recovering markets or finding new or alternative markets. Similarly, China is encouraging large enterprises to cooperate with SMEs, by

increasing their support in supply chains, in terms of raw material supply and project outsourcing while Indonesia is trying to boost SME exports by virtual business match making events. Other countries such as Italy, New Zealand and Slovenia are also offering aid for internationalisation and measures to diversify export markets. In South Africa, government is promoting the participation of SMEs in supply value-chains, in particular those who manufacture or supply various products that are in demand, emanating from the current shortages due to COVID-19 pandemic.

Research Methodology

Research Design

Based on the challenges faced by small entrepreneurs in Mauritius concentrating on the SME sector, a deductive research approach has been used where there is the development of theory, formulation and collection of data to these cases.

First, primary data (the study of principles and theories) is gathered, followed by the collection of secondary data.

Target Population

A sample is a small group of people from a population. It is not possible to approach the whole Mauritian population due to its huge size. A sample has been drawn from the population based on which primary data has been collected. For this study on the behaviour of the Mauritian population, the primary data collection method has been used. Surveys and questionnaires have been used to collect data from small entrepreneurs and then obtain results. Currently, there are around 125,500 SMEs in Mauritius. Consequently, since it would be impractical to collect and analyse the data from the total population of the SMEs, sampling has been conducted.

Sampling Strategy

In research terms, a sample is a group of people, objects or items that taken from a larger population for measurement. In this survey targeting a population of 120 respondents, random sampling has been used for probability sampling and the convenience method has been used for non-probability sampling due to a small number of respondents. The choice of a sample of the population is a non-probability choice where it is made through convenience which means that only available respondents will be contacted. Convenience sampling is a type of non-probability sampling that involves the sample being drawn from that part of the population that is close to hand. This type of sampling is most useful for pilot testing.

Sources of Data

Primary data has been used mostly as it is more fresh data and informations have been collected for the specific purposes of this study. Primary data has been used mostly for finding out the solution to my research problem.

Data Collection Method

A questionnaire is appropriate as it is the easiest and cheapest data collection method, especially in cases of large sample size. To encourage the response rate, the questions are set clear, concise and in a structured manner to engage the interest of the respondents.

My respondents for questionnaires would be a sample comprising of the following:

- ❖ Hardware stores (“Quincaillerie”);
- ❖ Snacks and small restaurants;
- ❖ Fruit and Vegetables seller;
- ❖ Trade Fairs/Bazaar;
- ❖ Artisanal shops;
- ❖ Cake shops; and
- ❖ Retailers

Pilot Study

For the purpose of the study, we initially targeted to retrieve 150 responses. However, only 139 were retrieved and used for analysis. 19 questionnaires have been discarded due to some technical errors on the Google Forms. The remaining 120 questionnaires were used for the research study. A pilot test of 120 questionnaires has been done to ensure success in the collection of data, the questionnaire has been administered through interview. Online questionnaire has been done through google online form which has achieved a high response rate as, due to technology advancement, most respondents are able to access the questionnaire with just a simple click.

Data Analysis

Descriptive analyses like data table, pie chart, bar chart, cross-tabulation has been used to illustrate the findings gathered through the survey.

Conclusion

The methodology and research design used in this study has been described. This chapter has also elaborated on several topics like the research approach, the target population, the sampling techniques, the data collection techniques and the reliability and validity testing. In general, the results obtained showed how entrepreneurs have responded to the questionnaires and their views and opinions about the problems they have faced in their

businesses. By doing this, it can be determined whether there has been more positive responses, negative responses or neutral feedback.

Analysis and Findings

- It can be noted that out of the population (120 SMEs), 40 respondents are in family business; 40 respondents own a sole trader business; 20 respondents work in a company; 10 respondents are in a type of business other than those listed in the questionnaire; 5 respondents are in partnership; and 5 respondents have not specified their type of business. Hence, the majority of the respondents are mostly in family and sole trader business.
- It can be seen that most of the respondents are in family business and in the sole trader business and that the nature of business which is more common is food and beverages. This might be explained by the fact that many respondents have engaged themselves in family business dealing with food and beverages, such as owning a restaurant or food stall which has been passed from generations to generations. As fast food is very common in Mauritius, it is also possible that setting up a business in the food and beverage industry is very profitable and is much easy to gain popularity quickly. This industry may have good career prospects for them and they find self-satisfaction in this business.
- Regarding the number of employees, 90 respondents have less than 5 or equal to 5 employees; 10 respondents have 6 to 10 employees; 9 respondents have 30 or more employees and 7 respondents have no employee. Of the remaining 4 respondents, 2 have employed 11 to 20 employees and the other 2 have employed 21 to 30 employees. It seems that the most common category of the number of staff employed is the less than 5 or equal to 5 category.
- Concerning the choice of business location, 67% of respondents, which accounts for more than half of the population, operate their business in urban areas and 27% operate in rural areas. A minimal percentage of 6% of the respondents have not specified their business location. A significant number of entrepreneurs who participated in the survey set up their business location in urban areas and the reason/motivation for their decision is further elaborated in the next section.
- Out of the population, when categorising the number of years in business, 16% belong to the less than 1 year category; 27% are in business between 1 to 3 years; followed by 16% belonging to the 4 to 10 years category; 13% are in business between 11 to 15 years; 8% are in business between 16 to 20 years; and 14% have been doing business for 21 years or more.
- The extent respondents agree or disagree on the motivations to start an entrepreneurial career: Most agree that entrepreneurs are motivated to set up their own business as they want to be their own boss and they want to fulfil a need for achievement which means that as an entrepreneur, they want to be successful and achieve something in life. This need for achievement encourages people to become entrepreneurs rather than being employed under someone. They are also agreeable on the fact that unemployment triggers the motivation to start a business by themselves.
- Out of 120 respondents, 47 respondents have not encountered difficulties before setting their business. 65 respondents, which accounts for 54% have had to face obstacles before setting their business. The other 8 respondents have not answered the question.
- 54% of respondents have faced difficulties in their business as the risks are too high for them. Also, there is more work than for an employee working in business rather than working in a company. The income is unstable; when the business is profitable, they get their income when the business makes losses, they may not get income at all. Also, the tax burden is high, they get lots of difficulties operate as an entrepreneur.
- 46 respondents have not face problems after starting as an entrepreneur whereas 65 respondents have had to deal with impediments in their business as an entrepreneur. In addition, 9 respondents have not answered this question.
- Most respondents have not answered this question. Disregarding the unanswered part, the data collected has shown that most of the constraints, if not all, have been encountered at the start-up stage only. The most common barrier faced in this phase was financial problems.

Hypothesis Testing

Hypothesis 1

H0 The choice of business location has no significant impact on the success of an entrepreneurial venture.

H1 The choice of business location has a significant impact on the success of an entrepreneurial venture.

Given that r is the value correlation coefficient of the individual and $r = 0.043$, there is a positive correlation between the time spent in the business and the business life. This means that setting up business in rural or urban regions has an impact on the duration of entrepreneurship.

Hypothesis 2

H0: There is no relationship between gender and pull factors of motivation
H1: There is a relationship between gender and pull factors of motivation.

Given that r is the value correlation coefficient and $r = 0.190$, the gender of an entrepreneur influences the motivational factor 'Be your own boss'.

Hypothesis 3

H0 There is no relationship between gender and push factors of motivation.
H1 There is a relationship between gender and push factors of motivation.

There is a positive relationship between the gender of respondents and the push factor unemployment as the coefficient value $r = 0.031$. It means that the two variables are poorly related.

Face To Face Interviews

From face to face interviews, I have discovered that the characteristics of the entrepreneurs most likely are self-dependent. During the survey, when asking respondents questions about the support needs of entrepreneurs, they have answered that independence is key and we should cultivate the ability to manage our business on our own. We should have the capability to bounce back during crisis situation and never give up. Many entrepreneurs during COVID-19 period have had to strive even harder than usual to earn their living and "survive" the crisis period. In addition, they have received only Rs 5,100 monthly from the government under the self-employed assistance scheme, which is less than the minimal wage in Mauritius. The amount received although cushioned a little extent the financial loss during the pandemic, it was obviously not sufficient for them to manage their business effectively and cover all the losses incurred during the lockdown period. At that time, those who were optimistic, resilient, determined and patient had been able to look forward ways to mitigate the losses instead of reminiscing on loss of business. They could not operate efficiently due to the restrictions imposed by the government.

"There is no success without sacrifice." Entrepreneurs are very committed and dedicated to their work. They are very motivated and work at even odd hours in order to earn higher profits. Some work not only for money but for self-satisfaction. They invest in much time and effort to expand their business, and if they reap profit, the profit earned belongs solely to them. They also advised me to always be a boss of myself so that I can be the master of my own holidays.

Conclusions and Recommendations

Discussion of Results

To resolve the problems facing small entrepreneurs in Mauritius, research goals have been validated for the research report. The small and medium sized business market. First, the characteristics of entrepreneurs in Mauritius are under 'face to face interviews'.

According to the results, or study findings, 54 percent of respondents had problems before beginning a entrepreneurship, and the same percentage had difficulties during their business careers. Based on the hypothesis that entrepreneurial obstacles have a major effect on business development and the motivational factors, especially with gender being a major discriminating factor for women entrepreneurs, the hypothesis (Hypothesis 2) is appropriate since the two separate variables are related

According to the hypothesis testing being made, this concludes that setting up businesses in rural or urban regions have an impact on the duration of entrepreneurship as concluded in this survey. Likewise, this has a significant influence on the viability of an entrepreneurial company when selecting a business location. Location

of the Internet cafés is found to be having a direct and significant effect on business success. This finding supports previous finding stating that business location had relationship with business' success. The specific location factors that are important differ from business sector to business sector.

Recommendations

Following a gradual change in mentality, we now witness many SMEs which are operated by women entrepreneurs who are adept in the management of the business and bring much economic benefits to the society. On the same wavelength, women have become more autonomous and prosperous, and bearing this in mind, their empowerment has been on the agenda of the national SME Master Plan. According to World Bank, "the gender gap in education in middle and high-income countries has mostly disappeared. In some countries, girls outstrip boys in schooling outcomes, yet women earn about 16% less money per hour worked than men. Yet, the high achievements and qualifications of women are not leading them to excellent job opportunities. Platforms must be put in place to match the qualifications and skills of those women entrepreneurs to the market, hence eliminating the gender barriers.

In addition, some entrepreneurs who have not a high background of education prefer to queue up for payment of goods and/or services; they are not technology savvy and are reluctant to use new technology in view of their little or no knowledge. Many old entrepreneur still prefer the traditional way of doing business – cash basis of purchases and sales with minimal or no records of transactions retained. This becomes an impediment for them in times of need for financial assistance as they have no reliable ways to prove the amount and source of income over a given timeframe.

Even though many technological applications (my.t money, Juice, etc) have been invented for ease of doing business, entrepreneur have not received much training on their use. It would be recommended to appoint a dedicated person in the banks, ATMs, service providers, to explain to them the benefits of using technology and how to use it. Video tutorials on YouTube are also helpful as it is a visual means of dissemination the knowledge. Free counselling can also be provided in support institutions free of charge as well as training courses/sessions can be implemented to impart knowledge and advice. Free advertising for the entrepreneurs can be provided by support institutions.

Now, internet banking and mobile banking have become common payment methods. These payment methods save much time to the entrepreneurs who can use it to concentrate on running their business. No need to close down just to pay bills – they can simply use the mobile application my.t BillPay or Juice. Continuous advertising creates awareness on the use of technology and their benefits.

Coupled with the above, registered entrepreneurs who are in need of cash flows to start a business can mortgage their shares in the new business to be created in lieu of their house as collateral. Entrepreneurs who wish to embark on a new business, for instance producing domestically some of the imported goods such as dairy products, can send up their proposal of financial/support institutions and can benefit from subsidies. If this is successful, they can sell at a lower than imported price and reap huge profits; the economy will also benefit as there is no transfer out of foreign exchange and the products can be exported.

Local expos or trade fairs can be organised from time to time to promote the products domestically made by entrepreneurs and providing free transport will attract customers. SMEs with a modern mindset can give out e-vouchers, loyalty cards or offer limit deals on Facebook to secure new customers. Online shopping added with home delivery services is becoming trendy and smart entrepreneurs could make good use of it. During the lock down period in Mauritius, many people have ordered food, groceries, and other necessities online which were subsequently delivered at home. Through this line of business, there is no need for large business premises to reduce rental payments and the business can operate on a 24 hour basis.

References

- Alstete, J. (2003)**, ``On becoming an entrepreneur: an evolving typology``, International Journal of Entrepreneurial Behaviour and Research, Vol 8 No 4, pp 222-34
- Bank of Mauritius (2020)**, COVID-19 Support Programme: Supporting Systemic Economic Operators and Financial Stability, retrieved from <https://www.bom.mu/media/covid19-actions/covid-19-support-programme-supporting-systemic-economic-operators-and-financial-stability> on 30.12.2020.
- Bartik, A.W., Bertrand, M., Cullen, Z.B., Glaeser, E.L., Luca, M., & Stanton, C.T. (2020)**. How are small businesses adjusting to covid-19? early evidence from a survey (No. w26989). National Bureau of Economic Research.
- Cepel, M., Gavurova, B., Dvorský, J., & Belas, J. (2020)**. The impact of the COVID-19 crisis on the perception of business risk in the SME segment. Journal of International Studies.
- Chowdhury, S.R. (2011)**. Impact of global crisis on small and medium enterprises. *Global Business Review*, 12(3), 377-399.
- Deakins, D. and Freel, M. (2009)**. Entrepreneurship and small firms, 5th ed New York: Mc Graw-Hill Education
- Donthu, N., & Gustafsson, A. (2020)**. Effects of COVID-19 on business and research, *Journal of business research*, 117, 284.
- Foss, N.J. and Klein, P.G. (2012)**. Organising Entrepreneurial Judgement. A new approach to the firm, New York, Cambridge University Press, P30-39
- Hakim, C. (1989)**, ``Recruits to self-employment in the 1980s``, *Employment Gazette*, June pp,286-97
- International Labour Organisation (ILO) (2020)** MSME Day 2020: the COVID -19 pandemic and its impact on small business, retrieved from https://www.ilo.org/empent/whatsnew/WCMS_749275/lang--en/index.htm, on 19.11.2020
- Kirkwood, J. (2009)**, Motivational Factors in a push-pull theory of entrepreneurship, *Gender in Management: An International Journal*, Vol 24, pp,246-364
- Langowitz, N and Minniti, M. (2007)**, ``The entrepreneurial propensity of women, *Entrepreneurship, Theory and Practice*, Vol 31, No3, pp, 341-364
- McClelland, E, Swail, J, Bell, J and Ibbotson P.(2005)**, ``Following the pathway of female entrepreneurs: a six-country investigation``, *International Journal of Entrepreneurial Behaviour and Research* Vol 11 No 2, pp, 84-107.
- Morais, F., & Ferreira, J.J. (2020)**. SME internationalisation process: Key issues and contributions, existing gaps and the future research agenda. *European Management Journal*, 38(1), 62-77.
- Mukosa, F., Mweemba, B., Mwitumba, L., Sikazwe, W., Mbewe, S.B., Katebe, M. & Sinkala, N.K. (2020)**. The impact of covid-19 on small scale businesses in Zambia. *Banking and Insurance Academic Journal*. 2 (6): 1-7
- OECD (1998)**, *Fostering Entrepreneurship*, Organisation for Economic Cooperation and Development, Paris
- Organisation for Economic Co-operation and Development (OECD) (2020)**, Coronavirus (COVID-19): SME policy responses, retrieved from <https://www.oecd.org/coronavirus/policy-responses/coronavirus-covid-19-sme-policy-responses-04440101/#section-d1e158> on 17.12.20
- Rahman, M., & Mendy, J. (2019)**. Evaluating people-related resilience and non- resilience barriers of SMEs' internationalisation. *International Journal of Organizational Analysis*.

Ratnasingam, J., Khoo, A., Jegathesan, N., Wei, L.C., Abd Latib, H., Thanasegaran, G., & Amir, M.A. (2020). How are small and medium enterprises in Malaysia's furniture industry coping with COVID-19 pandemic? Early evidences from a survey and recommendations for policymakers. *BioResources*, 15(3), 5951-5964.

Sannajust, A. (2014). "Impact of the World Financial Crisis to SMEs: The determinants of bank loan rejection in Europe and USA," [Working Papers](#) 2014-327, Department of Research, Ipag Business School.

SMEcorp, Malaysia (2020), Additional Measures to Support SMEs Affected by the OVID19Outbreak, retrieved from <https://www.smecorp.gov.my/index.php/en/initialatives/2020-03-31-00-53-27/additional-measures-to-support-smes-affected-by-the-covid-19-outbreak> on 31.12.2020

Storey, D.J. (1994), Understanding the Small Business sector, Routledge London

Wehinger, G. (2014). SMEs and the credit crunch: Current financing difficulties, policy measures and a review of literature. *OECD Journal: Financial Market Trends*, 2013(2), 115-148.

World Bank, (2020). The COVID-19 (coronavirus) outbreak has set off the first recession in the SubSaharan Africa region in 25 years, with a growth forecast between -2.1 and -5.1 in 2020, from a modest 2.4% in 2019. Geneva: World Bank.

Identifying Barriers to the Glass Ceiling in the Indian Information Technology sector: A Confirmatory Factor Analysis and Structure Equation Modelling Approach

Swati

Assistant Professor, Department of
Commerce, Govt. College Hathin, Palwal,
Haryana, India

Dr. Manisha Arora

Associate Professor, Department of
Management Studies, Deenbandhu Chhotu
Ram University of Science and Technology,
Murthal, Haryana, India

Abstract

The glass ceiling is a metaphor used to express an artificial but real discriminatory barrier for working women. These barriers occur from various sources. They may arise from personal boundaries, from societal or cultural restrictions, from family or organisation itself. The personal barrier arises when women doubt themselves of the competencies required to achieve higher positions and when women restrict themselves from being promoted because of various unavoidable responsibilities apart from work. Family acts as a barrier when the family itself is responsible for keeping her restricted to a low-profile job. The societal and cultural barrier also plays a major role in restricting women at lower levels because of stereotypes and prejudices. Organisations act as a barrier when there are no clear policies about promotion and even if there is transparency, some things restrict women. This study is about identifying these barriers and how these restrict women from being promoted. For this purpose, a sample size of 500 working women in the Indian IT sector is taken. But a total number of 431 responses returned. Exploratory Factor analysis was performed on 51 variables and 10 constructs were identified. Further, to develop and validate the model confirmatory factor analysis and Structure equation modelling were done. The findings of the study states that there are significant barriers that significantly impact the women in Indian IT sector.

Keywords: Women, Inequality, Organisation, Family barriers, Differential behaviours.

Introduction:

The Indian IT sector plays a crucial role in economic growth and is known for its global presence. However, despite the progress recorded, there is a significant gender disparity in the number of women who are promoted to higher positions. Historically, the Indian IT sector is male-dominated, like many other countries. A report by NASSCOM reported that women make up a considerably high percentage of the workforce at the entry level, and declines at the senior management level (NASSCOM, 2020). The variance indicates the systematic challenge that goes beyond recruitment practices (Kumar & Maiti, 2019). The low and minimal representation of women in senior roles raises concern about equality, equal opportunities, inclusivity, and underutilisation of workforce's full potential (Srivastava & Chandra, 2018). This chapter delves into the various obstacles that restrict women to be promoted in Indian IT sector, Focusing on Individual barriers, organisational barriers, Societal and cultural barriers, and Family barriers.

Individual Barriers:

Women often encounter obstacles in the workplace due to perceived gender norms and self-doubt. There is another phenomenon called imposter syndrome, where women often doubt their abilities, despite evident success (Clance & Imes, 1978). This phenomenon is especially prevalent in the IT industry, which is primarily male-dominated. Women also undervalue their worth and achievements, which raises the issues of self-doubt and self-sufficiency. The problem of self-doubt hinders women's career advancement by accepting low-value tasks and declining high-value tasks (Babcock et al., 2017). Such challenges can hinder women's confidence in seeking promotion.

Organizational Barriers:

The organizational barriers represent gender bias in recruitment and promotion processes, unequal pay, and lack of representation in leadership positions which create an unfavorable environment for females working in the Indian IT sector. This all based on the perception of female gender roles and leadership roles (Eagly & Karau, 2002). Moreover, lack of transparency in career progression path also puts women at disadvantage. These deep-rooted barriers in workplace culture and practice needs to be addresses to create equitable and inclusive environment (Ibarra et al., 2013).

Societal and Cultural Barriers:

Sometimes external pressure also plays a major role in the overall development. Societal and cultural barriers encompass such pressure and norms that influence women's career progression. In India, traditional gender roles are deeply ingrained, leading to societal expectations that prioritise family responsibilities over professional growth for women (Bombuwela & Chamru, 2013). These cultural norms discourage women from achieving leadership roles, as they are perceived as incompatible with family obligations.

Family Barriers:

Family is the major and unavoidable factor that affects the women in Indian IT sector. Women experience "double burden syndrome", and try to balance their career and domestic responsibilities. Women are supposed to take maternity and childcare leave, which disrupts their career continuity and also affects their chances of promotion. Further, women are more likely to quit jobs and stay back at home for children and parental care. This shows lack of support from family and spouse (Verma, 2011; Bindu, 2022; Bombuwela, and Chamru, 2013). The women working in the Indian IT sector faces multiple set of barriers that prevent them from reaching higher positions. In this chapter, we try to delineate various barriers women experience.

Literature review:

The "glass ceiling" term was first originally used by Marilyn Loden in 1978 in a speech (Nair, 2023). In 1979, this term was used by Marianne and Katherine Lawrence as per the newspaper The Wall Street Journal at Hewlett Puckered. They defined the glass ceiling as a discriminatory promotion pattern where there is no specification about discrimination in written promotional policies but in practice qualified women are denied promotion. The glass ceiling is not just a term but a worldwide issue, it is evident by the wage gap in the US workforce, which ranges from \$5,035 to \$9,577 (Alkadry, 2006.). This wage gap varies across employers and occupations. The situation is worse in Asian Countries where this gender wage gap is more viable and visible. The pay discrimination based on gender is more prevalent in self-financing institutions than in govt. institution in India (Sharma et al., 2011). In addition to the workplace gender wage gap, numerous factors are responsible for such kind of discrimination. Working Indian women face various discrimination throughout their lives. They often encounter Social, cultural, organizational, personal and family-related barriers in pursuing their career. These are deeply rooted internal belief systems that prevent female employees from reaching their full potential (Sud & Amanesh, 2019). The glass ceiling hypothesis states that, although it is harder for a woman to be promoted, it is way harder for a woman to move up in a hierarchy once they promoted (Baxter & Wright, 2000). Four characteristics need to be examined to determine whether glass ceiling existed in an organization. The four characteristics are: "1) a gender or racial difference that cannot be explained by job-relevant characteristics, 2) a gender or racial difference that is more pronounced at higher levels than at lower levels, 3) a gender or racial inequality in the chances of advancement into higher levels, and 4) a gender or racial inequality that increases over the course of a career" (Cotter et al., 2001). The four stated variables can be used to check the existence of the glass ceiling in any organisation. Identifying the presence of the glass ceiling and working out ways to remove such practices from the organisation can contribute to fading the glass ceiling. One of the ways is by increasing the number of females in higher positions may significantly reduce these forms of barriers (Bell et al., 2002). But women do not get equal opportunities and resources to reach to top-level. It is evident that women get more chances of promotion in times of crisis than prosperity (sun et al., 2014), even then women perform better than men. Moreover, women often face difficulty due to lack of support, guidance and Authority to achieve their targets (Glass & Cook, 2016). Women face difficulty in leading also as they face resistance from their subordinates. Furthermore, men and women and men employ different leadership philosophies, where men lead their subordinates and women facilitate (Jarmon, 2014). From previous studies various glass ceiling barriers were identified. These barriers are further categorized as individual barriers, Organisational barriers, Societal and cultural barriers, and Family barriers. Individual barriers were identified from previous studies as lack of communication skills (Datta & Aggarwal, 2017), Lack of problem-solving skills (Sahoo & Lenka, 2016), Lack of networking skills (Verma, 2011; Gupta & Mittal, 2016), Lack of guidance and support (Verma, 2011), More emotional and family oriented (Bombuwela & Chamu, 2013), lack of proper career planning (Mishra, 2013), Women avoid taking extra responsibility (Azeez & Priyadarshni, 2018), Motherhood over career development (Bindu, 2020), less concerned about promotion, less ambitious than men, lack of self-assurance, lack of interest in undertaking important & difficult assignment (Datta & Aggarwal, 2017), don't want to hold position of power (Eagly & Carli, 2007). In the same way Organisational barriers were identified as lack of policies to support women's career progression (Bhatnagar & Jain, 2012; Bombuwela & Chamru, 2013; Umadevi, 2015), lack of appropriate counsellors and managers (Verma, 2011), lack of encouragement to women (Madhulata, 2016; Manasa & Subramanian, 2016), get limited decision-making power (Sahoo & Lenka, 2016; Chatterjee & Mukherjee, 2018; Bindu, 2020), women must perform better than men to be promoted (Umadevi, 2015; Datta & Aggarwal, 2017; Chatterjee & Mukherjee, 2018), lack of participation in boardrooms (Sahoo & Lenka, 2016; Bindu, 2020), Organizational hierarchies are more likely to promote men for managerial positions

(Umadevi, 2015; Manasa & Subramanian, 2016; Datta & Agarwal, 2017), Management lacks genuine commitment to gender equality and advancement of women (Bombuvela & Chamru, 2013; Umadevi, 2015), Lack of mentoring and management training (Verma, 2011, Michailidis et al., 2012; Manasa & Subramanian, 2016), lack of enough female role models at the highest levels (Verma, 2011, Michailidis et al., 2012; Jonge, 2014), Insufficient general management and/or line experience of women (Budhwar, 2005; Datta & Agarwal, 2017), Top positions are predominantly held by men (Chatterjee & Mukherjee, 2018; Mishra & Banerjee, 2019), Men perceptions that they make better managers than women (Budhwar, 2005; Bhatnagar & Jain, 2012; Michailidis et al., 2012; Hill & Catherine, 2016; Singh & Kapoor, 2020), Sexual and mental harassment at their workplace (Bhatnagar & Jain, 2012; Madhulata, 2016; Hill & Catherine, 2016), Men do not accept female as a leader (Budhwar, 2005; Bhatnagar & Jain, 2012; Bombuvela & Chamru, 2013), Unwillingness of women to make the sacrifices required to obtain higher positions (Mate et al., 2018; Chatterjee & Mukherjee, 2018; Unal & Klinik, 2019; Azeez & Priyadarshni, 2018), Women have to make too many compromises to gain highly paid positions (Mate et al., 2018; Chatterjee & Mukherjee, 2018), Women are not assigned challenging task and kept at entry level (Datta & Aggarwal, 2017; Saleem et al., 2017; Chatterjee & Mukherjee, 2018; Bindu, 2022), Male employees have strong networks than female employees (Budhwar, 2005; Verma, 2011; Chatterjee & Mukherjee, 2018), Women are considered as less competitive and less superior (Bhatnagar & Jain, 2012; Datta & Aggarwal, 2017; Chatterjee & Mukherjee, 2018; Bindu, 2022). The Societal and cultural barriers identified as Stereotype belief about women as homemaker and men as bread earner (Verma, 2011; Bombuwela & Chamru, 2013; Hill & Catherine, 2016; Datta & Aggarwal, 2017; Azeez & Priyadarshni, 2018), Lack of participation and social inclusion due to family background (Budhwar, 2005), Conflict between different group and communities (Unal & Klinik, 2019), Stereotype about community, group, culture and gender (Eagly & Carli, 2007; Azeez & Priyadarshni, 2018; Unal & Klinik, 2019; Verma, 2011), Child bearing and caring forces women to quit job (Bindu, 2020), Women are found more against women because of queen bee syndrome (Rudman & Glick, 2001; Eagly & Carli, 2007), Competitiveness in women is perceived as a negative (Bhatnagar & Jain, 2012; De Klerk & Verryne, 2017), Progressive behaviour of women is seen as different and inappropriate (Bhatnagar & Jain, 2012; De Klerk & Verryne, 2017), Employer perceives women may leave for family reasons (Bindu, 2022), Employees resistance to mentoring by women employee (Budhwar, 2005; Bhatnagar & Jain, 2012). The Family related barriers identified as Women have dual work pressure (Budhwar, 2005; Eagly & Carli, 2007; Verma, 2011, Michailidis et al., 2012; Subramaniam et al., 2014; Hill & Catherine, 2016; Manasa & Subramanian, 2016), Women cannot work on holidays because of family restrictions (Bhatnagar & Jain, 2012; Bombuvela & Chamru, 2013; Bindu, 2020), Women don't prefer travelling away from home for work related assignments (Bindu, 2020), Women are found unable to stay for extra working hours (Bhatnagar & Jain, 2012; Subramaniam et al., 2014), Family is the important factor due to which women avoid travel and transfers (Ismail & Ibrahim, 2008), Women supposed to take break in service than men (Bindu, 2020), The marital status of women is a hindrance in career progress (Ismail & Ibrahim, 2008; Subramaniam et al., 2014), Child care and Parental care responsibilities is supposed to be with women only (Buddhapriya, 2009; Bombuwela & Chamru, 2013; Subramaniam et al., 2014; Unal & Klinik, 2019). The barriers identified are from various national and international studies and tested in different industries. It is crucial to thoroughly test the presence of these barriers in the Indian IT sector. This will enable us to gain valuable insights and address any existing challenges head-on. So, this study is meant to identify the barriers that prevent women from being promoted to the Indian IT sector.

Objectives of the study:

- To identify the barriers that prevent women from being promoted to higher positions in the Indian IT sector.
- To Test and validate the Glass Ceiling model using Path analysis.

Research Methodology:

This section is meant to outline the methodology used to identify the barriers to the glass ceiling in the Indian IT section. The study examines the underlying construct and relationship contributing to these barriers by employing Confirmatory factor analysis and Structural equation modelling.

Research Design:

This is a cross-sectional and quantitative study aimed at identifying and analysing the factors hindering women's advancement to higher positions in the Indian IT sector.

- Research Objective: the main objective of the research is to identify the key barriers to women's career advancement in the Indian IT sector. Moreover, the objective is to validate the construct through confirmatory factor analysis and to examine the structural relationship between identified barriers using Structural Equation Modelling.

- Population and Sample: - The population for the study consists of female employees working in Indian IT sector. A purposive sampling technique was used to select sample of 431 female employees from different IT companies across India. This sample size ensures sufficient statistical power for CFA and SEM analysis.
- Instrument: -A structured questionnaire was developed through comprehensive review of the literature. The questionnaire includes a demographic profile, and 4 sections of barriers bifurcated into Personal, organisational, cultural and Family related barriers. The questionnaire was administered online to ensure high response rate. The participation was voluntary and confidentiality was assured to all respondents.
- Data Analysis: -
- Reliability and validity testing: - To test the reliability Cronbach's alpha was used to assess the internal consistency of the scales. Composite reliability and average variance were extracted to ensure convergent and discriminant validity.
- Confirmatory factor analysis: - CFA was conducted to validate the measurement model and confirm the factor structure of the identified barriers. Model fit indices such as chi-square/df, CFI, GFI, and RMSEA are used to assess the goodness of fit.
- Structural equation modelling: - SEM was employed to examine the structural relationship between the identified constructs. Further, path analysis was conducted to test the hypothesised relationship and determine the significance of the barriers in contributing the glass ceiling effect.

Data Analysis:

Reliability statistics:

Cronbach's Alpha is used to check the internal consistency. A value of 0.891 as per table 7.1 indicates a high level of internal consistency among the 51 items in the questionnaire. This suggests that the items in the construct measure the same underlying construct. This high reliability is crucial for the validity of the subsequent analysis, confirmatory factor analysis and structural equation modelling, ensuring that the findings are based on dependable and consistent measurements.

Factor Analysis

• **KMO and Bartlett's Test**

The KMO value in of 0.863 in table 7.2 is considered very good and indicates a high level of sampling adequacy. This value above 0.8 suggest that sample is suitable for factor analysis. Bartlett's Test of Sphericity tests the null hypothesis that the original correlation matrix is an identity matrix, which would indicate that variables are unrelated and unsuitable for factor analysis. A significance level of .000 ($p < .05$), indicating that the variables are related and that the data set is suitable for factor analysis.

• **Rotated Component Matrix**

The rotated component matrix shown in table no. 7.3 shows that the statements have a positive loading on 10 components. All the constructs have high factor loading. These factors are labelled as (i) Gender Leadership Gap (ii) Barriers to Women's Career Advancement (iii) Bias in Promotion and Advancement (iv) Work-Life Balance (v) Societal Stereotypes and Constraints (vi) Societal Perceptions of Women's Roles (vii) Lack of Ambition and Self-Assertion (viii) Perceived Deficiencies in Women's Professional Skills (ix) Societal Stereotypes and Cultural Barriers (x) Family and Marital Factors.

Empirical Results of Path Analysis: -

- Confirmatory factor analysis (figure no. 7.3.1) applied to these ten factors i.e. Gender Leadership Gap, Barriers to Women's Career Advancement, Bias in Promotion and Advancement, Work-Life Balance, Societal Stereotypes and Workplace Constraints, Societal Perceptions of Women's Roles, Lack of Ambition and Self-Assertion, Perceived Deficiencies in Women's Professional Skills, Societal Stereotypes and Cultural Barriers, and Family and Marital Factors.
- **The model fit Indices**
CMIN/DF (Chi-Square Minimum divided by Degrees of Freedom): This is an index for assessing the model fit (Table 7.3.1), with lower values generally indicating a better fit. The ratio is 1.932 in the default model, suggesting an acceptable fit according to common guidelines (values less than 3). CFI values closer to 1 indicate a better fit (Table 7.3.2). A value of 0.930 suggests a fairly good fit. RMSEA values less than 0.05 indicate a close fit, values up to 0.08 represent a reasonable error of approximation, and values above 0.10 suggest a poor fit. A value of 0.047 falls within the range considered reasonable, indicating that the model fit is acceptable in terms of RMSEA.

The confirmatory factor analysis model also evaluates the significance of the regression weights, which represent the influence of each independent variable on the dependent variable. Below is a table that details the significance of these unstandardized regression weights:

Validity Statistics of the First-Order Confirmatory Analysis

The validity of the model is checked by the convergent validity and discriminant validity as in table no 7.3.5. If the value of AVE > 0.50 then the model is valid. In the table there is no convergent validity issue as all the values are greater than 0.5. Secondly, the value of MSV and ASV is less than AVE. So, there is no discriminant validity issue.

Overall Reliability Analysis

Generally, Cronbach's Alpha values range from 0 to 1, with higher values indicating greater internal consistency among items in the scale. In This study (table no. 7.3.6), most scales have high alpha values, suggesting that the items within each scale reliably measure the same underlying construct.

Findings and Discussion: -

The key findings from the study are as follows: -

- High internal consistency: - The study showed high level of internal consistency among 51 variables in the questionnaire, with Cronbach's Alpha 0.891.
- Factor Analysis: - Exploratory factor analysis revealed 10 constructs out of 51 variables and these constructs are: Gender Leadership Gap, Barriers to Women's Career Advancement, Bias in Promotion and Advancement, Work-Life Balance, Societal Stereotypes and Constraints, Societal Perceptions of Women's Roles, Lack of Ambition and Self-Assertion, Perceived Deficiencies in Women's Professional Skills, Societal Stereotypes and Cultural Barriers, Family and Marital Factors.
- Model fit: - The confirmatory factor analysis and structural equation modelling revealed that model fit were within acceptable range. The indices data as below: -
 - CMIN/DF: 1.932 (value less than 3 indicate acceptable value)
 - CFI: 0.930 (Value closer to 1 indicate a better fit)
 - RMSEA: 0.047 (Value less than 0.05 indicate a close fit)
- Reliability and validity: - The construct showed high reliability with Cronbach's Alpha values for different scales ranging from 0.805 to 0.930. Moreover, the composite reliability and average variance explained values indicated no issue with convergent and discriminant validity.
- Barriers identified: - The study identified that there are significant barriers that impact the career advancement of women in Indian IT sector, including: -
 - Personal barriers: - Self-doubt and self-assertion
 - organisational barriers: - Gender bias in promotion and promotion-based opportunities.
 - Societal and cultural barriers: Stereotype and societal perception about women's role.
 - Family barrier: Marital responsibility and childbearing duties.
- Path analysis: - The path analysis confirmed the structural relationship between the construct and validated the barrier's contribution to the glass ceiling effect.

The findings highlighted the barriers women faced in the Indian IT sector and provided a comprehensive understanding of how these barriers impeded their career advancement. The study highlighted the need for intervention of government and Institutions to address these barriers and promote gender equality in the workplace.

Discussion:

The finding of the empirical study aligns with numerous previous studies that explored the barriers to women career advancement in various sectors including IT sector. The construct Gender leadership gap documented by numerous studies the gender gap specifically at leadership positions in various industries including Indian IT sector. For instance, a study by Kumari and Pradhan (2014) found that women remain underrepresented at every level, with a significant drop at the senior level (Kumari & Pradhan, 2014). Bias in promotion and advancement construct is about biases in promotion opportunities, which hinder their career as documented by Bhatnagar and Mishra, 2010. The study found that women are less likely to be promoted to higher roles compared to male counterpart (Bhatnagar & Mishra, 2010). The construct of Work-Life balance is about the dual responsibility of women unshared and uncontributed acts as a critical barrier for women in India. It is emphasized that the lack of support for work-life balance can lead to career stagnation (Rajadhyaksha & Smita, 2004). Societal Stereotype and Constraints construct is about traditional gender roles and stereotypes about women's capabilities which acts as a hurdle in their professional lives (Sharma & Bhatnagar, 2016). Another construct Family and Marital status is about family responsibility and marital status which often limiting women's opportunities for advancement (Nath, 2000). Perceived Deficiencies in Women's Professional Skills construct highlights that women often face biases regarding their professional skills and are perceived as inferior to of men (Kumari & Pradhan, 2014). Societal Perception of women's roles is about primary role of women as caregivers significantly influence their

choices and opportunities (Das & Mishra, 2015). Lack of ambition and self-assertion can hinder women's career growth. Societal conditioning often discourages women from pursuing leadership roles (Eagly & Carli, 2007). Mentoring and networking opportunities, where women often lack access to the same quality of mentorship and networking opportunities as men, which hinders their career growth (Ibarra et al., 2010). By validating the findings of the study with existing literature, it is evident that the identified constructs are consistent with broader trends observed in various industries. The study's results are robust and supported by previous research, highlighting the pervasive nature of these barriers and the need for targeted intervention to promote gender equality in the workplace. Additionally, longitudinal studies can be done in future that could contribute on how these barriers evolve overtime and the long-term impact of implemented policies. Finally, this study contributes valuable insights into glass ceiling in Indian IT sector and offers a strong foundation for future research and practical initiatives to foster more equitable and inclusive environment.

Conclusion:

The study "Identifying barriers to the glass ceiling in the Indian IT sector: A confirmatory factor analysis and structural equation modelling approach" provided a comprehensive analysis of the barriers that affect women's career advancement in the Indian IT Sector. Through statistical methods like confirmatory factor analysis and structure equation modelling, the study identified and successfully validated key constructs contributing the glass ceiling effect. The study offers a robust framework for understanding the complex interplay of factors that contribute to the glass ceiling in the Indian IT sector. The identification of 10 key constructs provides valuable insights to organisations and policy makers to address and mitigate the gender inequality in the workplace. The study's findings identified the importance of a multi-pronged approach to breaking the glass ceiling and promoting women's advancement in the Indian IT sector. By addressing these barriers, the Indian IT sector can utilize the full potential of its female workforce. To foster a more equitable and inclusive work environment, target intervention must be needed. These could include developing gender-sensitive policies, providing work-life balance, challenging societal stereotypes, and creating family-friendly practices.

References:

- Alkadry, M. G., & Tower, L.E. (2006).** Unequal pay: The Role of Gender. *Public Administrative Review*, 66(6), 888-898.
- Azeez, P.V., Nilufer, & Priyadarshini, R.G. (2018).** Glass ceiling factors affecting women career advancement in the IT industry in India. *SCMS Journal of Indian Management*, 15(3), 101-111.
- Babcock, L., Recalde, M. P., Vesterlund, L., & Weingart, L. (2017).** Gender differences in accepting and receiving requests for tasks with low promotability. *American Economic Review*, 107(3), 714-747. <https://doi.org/10.1257/aer.20141734>.
- Baxter, J., & Wright, E. O. (2000).** The Glass Ceiling Hypothesis. *Gender & Society*, 14(2), 275–294.
- Bell, M.P., McLaughlin, M.E., & Sequeira, J.M. (2002).** Discrimination, harassment and the glass ceiling: Women executives as change agents. *Journal of Business Ethics*, 37, 65-76.
- Bhatnagar, S. & Jain, P. K. (2012).** Career development of women executives in the information technology sector. *International journal of service and research*. 3(5).277-280.
- Bhatnagar, D., & Mishra, P. (2010).** Organizational culture: Effects on gender disparities in promotion. *Gender in Management: An International Journal*, 25(3), 123-139. doi:10.1108/17542411011036497.
- Bindu, H.N. (2022).** A study on glass ceiling and its impact on the career development of women at workplace. *IJIRT* .8(8). 94-98.
- Bombuvela, P.M. and Chamaru, A.A. (2013).** Effects of glass ceiling on women career development in private sector organization- case of Sri Lanka. *Journal of Competitiveness*. 5(2). 3-19.
- Buddhapriya, S. (2009).** Work-Family Challenges and Their Impact on Career Decisions: A Study of Indian Women Professionals. *Vikalpa: The Journal for Decision Makers*, 34(1), 31-46.
- Budhwar, P., & Varma, A. (2010).** Indian Women in the IT Sector: Personal and Professional Perspectives. *Gender in Management: An International Journal*, 25(6), 444-460.
- Chatterjee, D., & Mukherjee, S. (2018).** Women in Leadership in Indian IT Industry: Challenges and Strategies for Success. *South Asian Journal of Management*, 25(1), 68-83.
- Clance, P. R., & Imes, S. A. (1978).** The impostor phenomenon in high achieving women: Dynamics and therapeutic intervention. *Psychotherapy: Theory, Research & Practice*, 15(3), 241–247.
- Cotter, D. A., Hermsen, J. M., Ovadia, S., & Vanneman, R. (2001).** The glass ceiling effect. *Social Forces*, 80(2), 655-681.
- Datta, S., & Agarwal, U. A. (2017).** Factors Effecting Career Advancement of Indian Women Managers. *South Asian Journal of Business Studies*, 6(3), 314–336.
- Das, S., & Mishra, P. (2015).** Societal perceptions and their impact on women's career choices. *Gender in Management: An International Journal*, 30(5), 315-334. doi:10.1108/GM-01-2015-0001.
- De Klerk, S., & Verreynne, M.-L. (2017).** The networking practices of women managers in an emerging economy setting: negotiating institutional and social barriers. *Human Resource Management Journal*, 27(3), 477–501
- Eagly, A. H., & Carli, L. L. (2007).** Women and the labyrinth of leadership. *Harvard Business Review*, 85(9), 62-71.
- Eagly, A. H., & Karau, S. J. (2002).** Role congruity theory of prejudice toward female leaders. *Psychological Review*, 109(3), 573-598.
- Glass, C., & Cook, A. (2016).** Leading at the top: Understanding women's challenges above the glass ceiling. *The Leadership Quarterly*, 27(1), 51–63.
- Gupta, N., & Mittal, S. (2016).** Women in Leadership Roles in Indian IT Industry: A Study on Challenges and Enablers. *International Journal of Advanced Research in Computer Science and Software Engineering*, 6(9), 199-204.
- Hill, Catherine (2016).** “Barriers and bias: the status of women in leadership, AAVW.
- Ibarra, H., Carter, N. M., & Silva, C. (2010).** Why men still get more promotions than women. *Harvard Business Review*, 88(9), 80-85.

- Ismail, M. and Ibrahim, M. (2008).** Barriers to career progression faced by women, *Gender in Management: An International Journal*, 23(1), 51 – 66.
- Jarmon, L. (2014).** Cracking the glass ceiling: A phenomenological study of women administrators in higher education.
- Jonge, A.J. (2014).** The Glass Ceiling that Refuses to Break: Women Directors on the Boards of Listed Firms in China and India. *Women's Studies International Forum*, 47(2), 326-338.
- Kumar, P., & Maiti, R. (2019).** Challenges and barriers for women in the Indian information technology (IT) sector: An analysis. *Gender, Technology and Development*, 23(2), 123-144. <https://doi.org/10.1080/09718524.2019.1650754>.
- Kumar, P., & Maiti, R. (2019).** Challenges and barriers for women in the Indian information technology (IT) sector: An analysis. *Gender, Technology and Development*, 23(2), 123-144. <https://doi.org/10.1080/09718524.2019.1650754>
- Kumari, S., & Pradhan, R. K. (2014).** Women in leadership: Barriers to their advancement. *International Journal of Management Research and Reviews*, 4(6), 730-735.
- Oakley, J. G. (2000).** Gender-based barriers to senior management positions: Understanding the scarcity of female CEOs. *Journal of Business Ethics*, 27(4), 321-334. doi:10.1023/A:1006226129868
- Madhulata. (2016).** Existence of glass ceiling and factors affecting women in reaching top positions. *IJAR*. 4(12). 1448-1460.
- Manasa, K., & Subramanian, N. (2016).** Barriers and Strategies for Women Leadership in the IT Sector in India. *International Journal of Advanced Research in Computer Science*, 7(5), 91-95.
- Mate, Susan Elizabeth; McDonald, Matthew; Do, Truc (2018).** The barriers and enablers to career and leadership development. *International Journal of Organizational Analysis*, IJOA(07)1475.
- Michailidis, M. P., Morphetou, R. N., & Theophylatou, I. (2012).** Women at work equality versus inequality: barriers for advancing in the workplace. *The International Journal of Human Resource Management*, 23(20), 4231–4245.
- Mishra, S. (2013).** Women on corporate boards: Supply and demand issues. *International Journal of Human Resource Management*, 24(5), 845-862. <https://doi.org/10.1080/09585192.2012.720186>
- Mishra, P., & Banerjee, A. (2019).** Glass ceiling in Indian IT sector: A study on career barriers for women. *International Journal of Advanced Research and Development*, 4(5), 60-64.
- Nair, V. (2023).** Barriers to Career Progression of Women to Senior Leadership Positions: Indian Scenario. *International Journal of Innovative Science and Research Technology*. 11(3),1018-1028.
- NASSCOM. (2020).** Women and IT Scorecard – India. NASSCOM. retrieved from <https://www.nasscom.in/knowledge-center/publications/women-and-it-scorecard-india#:~:text=Key%20Findings&text=Men%20and%20women%20start%20their,women%20at%20a%20similar%20level.&text=Women%20are%20concentrated%20at%20lower,in%20IT%20companies%20in%20India>.
- Nath, D. (2000).** Gently shattering the glass ceiling: Experiences of Indian women managers. *Women in Management Review*, 15(1), 44-52. doi:10.1108/09649420010310191
- Rajadhyaksha, U., & Smita, D. (2004).** Work-life balance in South East Asia: The Indian experience. *South Asian Journal of Management*, 11(1), 18-37.
- Rudman, L. A., & Glick, P. (2001).** Prescriptive gender stereotypes and backlash toward agentic women. *Journal of Social Issues*, 57(4), 743-762.
- Sahoo, D.K. and Lenka, U. (2016),** "Breaking the glass ceiling: opportunity for the organization", *Industrial and Commercial Training*, 48(6), 311-319.
- Saleem, Sharjeel; Rafiq, Asia; Yusaf, Saquib; Gopalakrishnan, Shanthi; Syed, Jawad (2017).** Investigating the glass ceiling phenomenon: an empirical study of glass ceiling's effects on selection - promotion and female effectiveness. *South Asian Journal of Business Studies*. 6(1).
- Sharma, M. A., Sharma, S., & Kaushik, D. N. (2011).** An Exploratory Study of Glass Ceiling In Indian Education Sector. *International Journal of Multidisciplinary Research*, 1(8), 73-82.

- Sharma, R., & Bhatnagar, D. (2016).** Factors influencing career advancement of Indian women managers. *Gender in Management: An International Journal*, 31(4), 276-296. doi:10.1108/GM-10-2015-0097.
- Singh, R., & Kapoor, R. (2020).** Women Leadership in Indian IT Organizations: A Study of Challenges and Strategies. *International Journal of Advanced Research in Computer Science and Software Engineering*, 10(2), 156-161.
- Srivastava, S., & Chandra, A. (2018).** Women in leadership positions: A study of the barriers and enablers in the Indian IT sector. *Journal of Human Resource and Sustainability Studies*, 6(4), 237-250. <https://doi.org/10.4236/jhrss.2018.64039>
- Subramaniam, I. D., Arumugam, T., Akeel, A. B. A. A. B. (2014).** Demographic and family related barriers on women managers' career development. *Asian Social Science*, 10(1), 86–94.
- Sud, S. and Amanesh, A. (2019).** Breaking Glass Ceiling In Leadership Roles, SHRM India, Retrieved from <https://www.shrm.org/shrm-india/pages/breaking-glass-ceiling-in-leadership-roles.aspx>.
- Sun, S. L., Zhu, J., & Ye, K. (2014).** Board Openness during an Economic Crisis. *Journal of Business Ethics*, 129(2), 363-377.
- Umadevi, K. (2015).** Glass ceiling among women employees in IT sector. *International Journal of business and administration research review*, 1(8), 22-27.
- Unal, Ashhan & Kılınç, İzzet. (2016).** Transformational leadership versus glass ceiling effect: a theoretical model from turkish IT sector. *Journal of Global Strategic Management*. 10. 135-150.
- Verma, M. (2011).** Barriers to Career Advancement of Women in Indian IT Industry - A Conceptual Framework. *Metamorphosis: A Journal of Management Research*, 10(1), 29–36.

A Study on Usage of Digital Financial Services in Odisha

Ms. Nirmala Chandra Pattnayak
Research Scholar, Department of Business
Administration, Utkal University, India

Dr. Rashmita Sahoo
Asst. Professor, Department of Business
Administration, Utkal University, India

Abstract

In a rapidly digitizing global landscape, digital financial inclusion stands out as a pivotal catalyst for advancing both financial and socio-economic well-being. Governments across the globe are increasingly getting reliant on digital financial inclusion owing to its immense potential in bringing hitherto underbanked and underprivileged people to formal financial systems.

As digital financial services continue to reshape the financial landscape globally, this study delves into the specific context of Odisha, a state located in eastern parts of India. Through a Primary survey conducted in eight districts of Odisha, the study aims to investigate the utilization patterns and socio-demographic determinants influencing the adoption of digital financial services. A mixed-methods approach, combining quantitative surveys and qualitative interviews, has been used in the study to comprehensively explore the dynamics of digital financial inclusion in a predominantly agrarian region.

The empirical findings of this study reveal strong positive correlations between age, education, and income with present usage and frequency of using digital financial services emphasizing their significant influence. The other socio-demographic factors like gender, social stratification and occupation are found to be weakly correlated indicating their lesser impact. Multiple regression analyses further establish the predictive power of age, education and annual family income as these factors emerge as strong determinants of digital financial inclusion.

Keywords: Digital Financial Inclusion, Socio-Economic, Digital Financial Services, Socio-Demographic Factors, Agrarian Region

Introduction

Financial services are vital to the functioning of an economy and for a country like India it assumes further significance as large-scale disparity is prevalent among people and in order to bring equitable and sustainable societal and economic development, unhindered access to formal financial services is crucial. A well-functioning financial system provides a favorable environment to individuals, households and businesses for savings, investment and availing of various other financial services and most importantly safeguarding against risks. It is therefore imperative that the reasons for financial exclusion are studied and measures are taken to address them effectively.

Digital financial inclusion offers a way to extend access to formal financial services to those who were previously unbanked, using digital technologies like mobile phones or other internet-enabled devices. Digital financial inclusion involves offering digital financial services to the financially excluded and underserved population and using a mobile phone or other digital devices to increase access to digital financial services (Ozili, 2018). Digital financial inclusion involves providing access to affordable formal financial services to the excluded population using existing digital technologies (Ozili, 2021b).

The objective of digital financial inclusion is to use digital channels for offering financial services to all individuals, households, business firms and governments which would lead to helping in poverty reduction, enhance financial intermediation and contribute towards attainment of sustainable developmental goals (Ozili, 2022). Digital financial inclusion enables financial services through digital means for access to deposits, remitting money, financial investments, savings and reducing risk. At the same time, it promotes efficient and effective networking among customers. There are three key components of digital financial service which is a digital transactional platforms, devices and retail agents (Lauer and Lyman, 2015). The continuous and rapid strides observed in availability of all these components have been proving to be a catalyst in exponential growth in digital finance access.

National Strategy for Financial Inclusion (2019-24) mentions that amongst multiple critical factors, creating enabling infrastructure, delivery to the last mile and financial innovations and technological advancements play a critical role in furthering digital financial inclusion. The strategy document mentions that there has been rise in

number of FinTech entities in last few years whose basic model is of considerable leverage of technology for offering financial services. Whereas the strengthening the infrastructure is primarily job of Governments and Regulators, the adoptability of digital payment methods by the people hugely depend on multiple factors.

The study of progress of digital financial inclusion in regional economies assumes critical significance in a country like India considering it is a large and diverse country. There have been various studies conducted towards measuring progress of digital payments penetration in subnational level but due to lack of comprehensive data available in this regard at state level, it has been so far found to be difficult. Therefore, it evokes interest for research at the regional level as we find inadequate literature in digital financial inclusion which is needed for making appropriate policies.

Odisha, a state falling in eastern part of India, falls in the eastern part of India and has been long considered as one of the most backward states and people are deprived of basic facilities in many regions. This study is an endeavor to identify social and demographic factors responsible for spread of digital financial services in various regions of Odisha. The state of Odisha has been registering steady growth in digital transactions owing to concerted efforts of the State Government, Union Government, regulators, banks and other financial institutions. The per capita digital payment transactions in Odisha stood at 5.3 making it 8th in ranking among major states of the country (Figure 1).

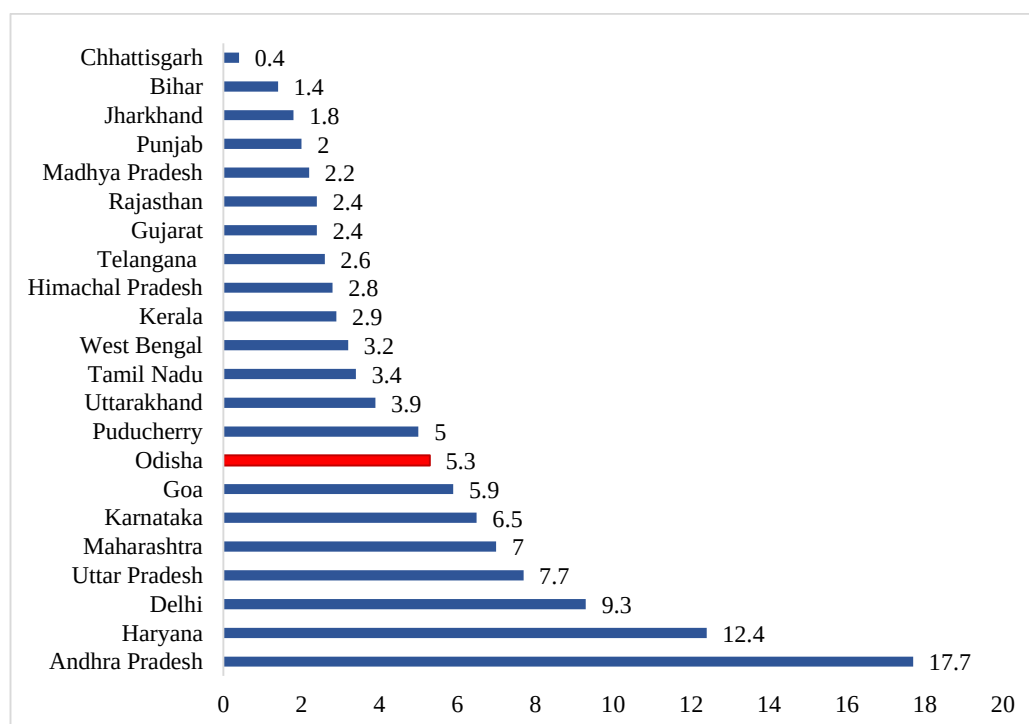


Figure 1: Per Capita Digital Payment Transactions of Major States/UTs of India (Number)

Source : NPCI (Data up to 30 June 2024)

Despite commendable efforts and significant strides in digital payments, major challenges are still observed in providing universal access to formal financial products, mainly for the people pertaining to remote rural areas and also many urban pockets. Various social and demographic factors continue to pose challenges to the widespread adoption of digital financial services in Odisha. The demonetization during 2016 and subsequently the Corona Virus caused global pandemic induced stress has brought many people of the state into the fold of digital financial services. The state Government of Odisha has also been creating enabling infrastructure continuously and spreading awareness to attract people towards digital financial services. Some of such notable initiatives are disbursement of social sector benefits electronically, electronic collection of State Government taxes, enabling various e-payment modes like UPI, Credit/Debit Cards, Internet banking, wallets for paying state government dues and more importantly creating a 'Centralised Public Grievances Redressal and Monitoring System(Jana Sunani)' for handling grievances.

This study, based on the data collected from a primary survey, attempts to assess the influence of various socio-demographic factors on usage of digital financial services from the primary data collected in a survey. The

survey was conducted in eight districts of the state located geographically in diverse regions. Empirical analysis is carried out to estimate the factors associated with digital financial inclusion.

Review of Literature

Kumar and Muhota (2012) in their study found out that the imminent surge in electronic payment usage is poised to be fuelled by the ongoing mobile revolution. Nevertheless, a few barriers such as concerns over consumer privacy and the security of electronic transactions may act as deterrents, particularly among the economically disadvantaged. Studies indicate that addressing these issues requires a dual approach: providing enhanced support to users and implementing supportive policy measures for deeper penetration of digital payments.

Paul (2013) in her study 'The adoption of electronic banking in Odisha' mentions that the expansion of the IT sector has enabled banks to establish a presence with their customers anytime and anywhere. Studies indicate that there are several elements, including education, computer literacy, public willingness, convenience and awareness impact the success of electronic financial transactions in a region. Interestingly, a significant number of individuals, particularly from the older generation lacking computer proficiency, still lean towards traditional banking. However, with some moderate adjustments and expedited service delivery, traditional banking is not entirely obsolete. Analyzing the data reveals a clear preference among the younger generation for computer and internet banking, specifically in activities like ATM usage and online transactions. The lowering costs of machines and improved connectivity play a pivotal role in the expanding ATM network, prompting banks to reduce expenses and achieve synergies through collaborative ATM sharing agreements.

Mihna and Behrooz (2015) aimed to investigate how different factors influence the behavioural aspects of embracing internet banking and other electronic methods in their study. The variables under scrutiny included societal impact, desired performance levels, enabling conditions, effort expectations and confidence. The findings revealed that, in terms of the dependent variable of behavioural aspects for usage of electronic banking, three factors i.e. effort expectations, societal impact and confidence displayed relatively lower significance.

Joshi (2017) in his study titled "Digital Payment System : Before, During and After Demonetization" has examined the repercussions of demonetization on digital payments and the variations in growth across different digital payment modes. The researcher employed a descriptive approach for their research. The research, analysing the NPCI released data, has found that the real impact of demonetization on electronic payment services manifested when there was shift in policies that necessitated people to embrace digital payment products in lieu of cash.

The digital financial services provide enhanced convenience, safety and liquidity. In addition to these advantages, it brings in increased accountability and tracking thereby reducing the chances of misappropriation and wrongful diversions. Further, digital payments aid in financial inclusiveness by providing access to various cost-effective financial products [Herwadkar, Verma and Bilantu (2019)].

Tiwari, Srivastava and Kumar (2019) in their study on 'Adoption of Digital Payment Methods in India' mentions that even though 17.5 per cent of the global population reside in India, 76 per cent of its adult populace do not possess awareness of financial concepts. There has been rapid transformation of digital payment technologies in Indian Banking Sector which has resulted into digital payment adoption to give further fillip to financial inclusion penetration. Their study reveals that lower penetration of digital financial services in India can be majorly attributed to education, awareness and access to internet-enabled devices.

Kulkarni and Varma (2021) in their "Literature study of Consumer Perception Towards Digital Payment Mode in India" have endeavoured to discern consumers' perspectives on online payments and assess the safety associated with such transactions. Primarily this study was aimed at unravelling the frequency of usage of e-payments and understanding the factors that customers encounter in usage of digital payment methods, potentially influencing their overall perception. The researchers underscored the exploratory nature of the study, relying on review of literature and available secondary data for its findings. The researchers acknowledged certain limitations, including the study's lack of depth, its non-exhaustive exploration of the literature, and the absence of quantitative data analysis. Despite these drawbacks, the paper identifies and highlights key thrust areas in the literature, offering valuable insights into consumer behaviour and perceptions regarding digital payment methods.

Behera, Saroy and Dhal (2023) in their study on 'Digital Payments in Urban Odisha: Insights from a primary survey' mentions that in Odisha, considered as a less developed state in India, there is evidence of upscaling in adoption of digital financial services. Their survey reveals that with increased awareness on digital payments and increase in access to smart phones the state is witnessing more aligned with usage of digital payments in the country. Also, with better education levels and increase in income level, cash-based transactions are decreasing

day by day and people are seen adopting digital methods especially in post pandemic era. Some of the factors which impede the growth of digital payments in the state are lack of internet penetration, slow internet and lower acceptance levels. The authors have concluded that incomes directly credited into bank accounts in place of cash propels users towards digital payments.

Acharya and Pandey (2023) in their study conducted in state of Telangana, based on a primary survey, found out that regional aspects, social and economic factors play critical roles in adoption of digital financial services. The study found that senior citizens and rural people show hesitation in electronic payment and receipts. Small businesses also expressed less confidence as they have mentioned that in order to confirm the receipt of payments, they have to continuously check their bank accounts.

Objectives of the Study

The study aimed at fulfilling following objectives:

- (i) To find out the usage patterns of digital payments in urban and rural areas
- (ii) To examine the influence of socio-demographic factors on usage of digital financial services in urban and rural areas
- (iii) To identify the socio-demographic factors which significantly predict usage of digital financial services

Research Methodology:

The study relies on primary data gathered through a purposive random survey from rural areas of eight districts of Odisha having a sample size of 660 out of which 350 belong to rural areas and 310 belong to urban areas. The eight districts selected for the study are located in diverse regions of the state and two each pertains to south, north, east and western parts of the State. The collected data is analysed in view of association of above socio-demographic parameters with usage of various digital payment methods.

Data Analysis and Interpretation

The primary data collected through a survey in eight districts of Odisha has been subjected for following statistical analysis:

- (i) Chi-Square Test and Cramer's V: The Chi-square Test was conducted to determine whether there is a statistically significant association between categorical variables i.e. socio-demographic factors and usage of digital financial services, in order to examine the relationship between these variables. Cramer's V values complemented the Chi-Square Tests by quantifying the strength of association and therefore, provide further insights into the relationships between these variables.
- (ii) Given that the primary data revealing impact of various social and demographic factors on adoption of digital financial services, correlation analysis was carried out to investigate the relationship between independent variables i.e. socio-demographic factors and dependent variables i.e. present use and frequency of use of digital financial services
- (iii) Multiple regression analysis was performed to quantify the influence of socio-demographic factors on usage levels of digital financial products and services.

The following are the results emerged from the statistical analysis:

Table 2: Profile of Survey Respondents on Present Use of Digital Payment Platforms

			Yes	No	Total	χ^2	Cramer's V
Credit Card / Debit Card	Rural	N	89	261	350	0.012 ^{NS}	0.004 ^{NS}
		%	25.4%	74.6%	100.0%		
	Urban	N	80	230	310		
		%	25.8%	74.2%	100.0%		
	Total	N	169	491	660		
		%	25.6%	74.4%	100.0%		
Pre-paid Card	Rural	N	5	345	350	0.037 ^{NS}	0.008 ^{NS}
		%	1.4%	98.6%	100.0%		
	Urban	N	5	305	310		
		%	1.6%	98.4%	100.0%		
	Total	N	10	650	660		
		%	1.5%	98.5%	100.0%		

			Yes	No	Total	χ^2	Cramer's V
Internet Banking	Rural	N	81	269	350	1.597 ^{NS}	0.049 ^{NS}
		%	23.1%	76.9%	100.0%		
	Urban	N	85	225	310		
		%	27.4%	72.6%	100.0%		
	Total	N	166	494	660		
		%	25.2%	74.8%	100.0%		
UPI	Rural	N	137	213	350	1.727 ^{NS}	0.051 ^{NS}
		%	39.1%	60.9%	100.0%		
	Urban	N	137	173	310		
		%	44.2%	55.8%	100.0%		
	Total	N	274	386	660		
		%	41.5%	58.5%	100.0%		
Mobile Wallets	Rural	N	208	142	350	18.353*	0.167*
		%	59.4%	40.6%	100.0%		
	Urban	N	233	77	310		
		%	75.2%	24.8%	100.0%		
	Total	N	441	219	660		
		%	66.8%	33.2%	100.0%		
Mobile Banking	Rural	N	80	270	350	2.649 ^{NS}	0.063 ^{NS}
		%	22.9%	77.1%	100.0%		
	Urban	N	88	222	310		
		%	28.4%	71.6%	100.0%		
	Total	N	168	492	660		
		%	25.5%	74.5%	100.0%		

N.B:- * - Significant at 5% Level ($P < 0.05$), NS – Not Significant at 5% Level ($P > 0.05$) for $DF=1$

Source : Researcher's Survey

A break-up of the data collected in primary survey shows that mobile wallets and UPI are the most used digital payment methods by the respondents. Pre-paid cards were found to be less popular among respondents and not being used by many. Chi-square values emerged non-significant for most of the modes except mobile wallets. The same was further substantiated by non-significant Cramer's V values.

(ii) Usage Pattern of Digital Financial Services:

The survey also attempted to capture the usage pattern among the respondents. Chi-square (χ^2) test and Cramer's V values were derived for understanding the associations between type of area and usage frequency of digital services, which are as below:

Table 3: Profile of Survey respondents on Frequency of Use of Digital Payment Platforms

			Occasionally	Frequently	Always	Total	χ^2	Cramer's V
Credit Card / Debit Card	Rural	N	48	29	8	85	2.598 ^{NS}	0.129 ^{NS}
		%	56.5%	34.1%	9.4%	100.0%		
	Urban	N	49	17	5	71		
		%	69.0%	23.9%	7.0%	100.0%		
	Total	N	97	46	13	156		
		%	62.2%	29.5%	8.3%	100.0%		
Pre-paid Card	Rural	N	4	1	0	5	3.143 ^{NS}	0.561 ^{NS}
		%	80.0%	20.0%	0.0%	100.0%		
	Urban	N	3	0	2	5		
		%	60.0%	0.0%	40.0%	100.0%		
	Total	N	7	1	2	10		
		%	70.0%	10.0%	20.0%	100.0%		

			Occasionally	Frequently	Always	Total	χ^2	Cramer's V
Internet Banking	Rural	N	43	19	12	74	6.041*	0.196*
		%	58.1%	25.7%	16.2%	100.0%		
	Urban	N	32	30	21	83		
		%	38.6%	36.1%	25.3%	100.0%		
	Total	N	75	49	33	157		
		%	47.8%	31.2%	21.0%	100.0%		
UPI	Rural	N	57	42	35	134	11.538*	0.207*
		%	42.5%	31.3%	26.1%	100.0%		
	Urban	N	36	69	31	136		
		%	26.5%	50.7%	22.8%	100.0%		
	Total	N	93	111	66	270		
		%	34.4%	41.1%	24.4%	100.0%		
Mobile Wallets	Rural	N	93	58	53	204	8.412*	0.140*
		%	45.6%	28.4%	26.0%	100.0%		
	Urban	N	91	46	86	223		
		%	40.8%	20.6%	38.6%	100.0%		
	Total	N	184	104	139	427		
		%	43.1%	24.4%	32.6%	100.0%		
Mobile Banking	Rural	N	43	17	20	80	11.632*	0.267*
		%	53.8%	21.3%	25.0%	100.0%		
	Urban	N	34	38	11	83		
		%	41.0%	45.8%	13.3%	100.0%		
	Total	N	77	55	31	163		
		%	47.2%	33.7%	19.0%	100.0%		

N.B:- * - Significant at 5% Level ($P < 0.05$), NS – Not Significant at 5% Level ($P > 0.05$) for $DF=1$

Source : Researcher's Survey

The data reveals significant differences in the frequency of using certain modes of digital payments (Internet Banking, Mobile Wallets, Unified Payment Interface and Mobile Banking) between rural and urban customers. UPI as a mode again emerged highly popular and frequently used digital payment method in rural as well as urban areas. Urban respondents displayed greater preference for Mobile banking compared to the rural users. Pre-paid cards have hardly registered their usage in all regions. The significant Chi-square values observed for internet banking, UPI, wallets and mobile banking indicate degree of difference in usage patterns of urban and rural customers. The same was further strengthened by significant Cramer's V values for all these payment methods. W.r.t. Credit/Debit Cards, no significant difference was observed in the frequency of using credit/debit cards between rural and urban respondents, with similar usage patterns and non-significant statistical values.

(iii) **Socio-Demographic Factors and Usage of Digital Financial Services:** A correlation analysis between social and demographic factors and present and frequency of digital transactions usage reveal the following:

Table 4 : Correlation of Socio-Demographic Factors with Usage of Digital Transaction Platforms

Socio-Demographic Factors	Rural Customers		Urban Customers	
	Present Use	Frequency of Use	Present Use	Frequency of Use
Age	0.679*	0.717*	0.672*	0.576*
Gender	0.079	0.051	0.008	0.068
Education	0.765*	0.795*	0.752*	0.733*
Social Stratification	0.083	0.016	0.041	0.015
Occupation	0.011	0.036	0.068	0.025
Annual Family Income	0.716*	0.742*	0.677*	0.644*

N.B:- * – Significant at 5% Level ($P < 0.05$) for $DF=349$ (Rural) and 309 (Urban)

Source : Researcher's Survey

Strong positive correlation coefficients for Age, Education and Annual Family income were observed in both rural and urban areas with education as the most important parameter. These indicate that people with higher educational levels, higher family incomes and higher age groups have greater likelihood of embracing digital financial services. Conversely, very weak correlation was observed for Gender, Social Stratification and occupation, as a factor, exhibits weak or negligible correlation.

Table 5 : Multiple Regression of Social and Demographic Factors with Present Use of Digital Transaction Platforms in case of Rural Customers :

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.016	0.006		2.724	0.007
Age	0.051	0.007	0.305	6.891	0.000
Education	2.051	0.028	0.116	72.576	0.000
Annual Family Income	0.098	0.012	0.431	9.461	0.000

N.B:- $r = 0.740$, $R^2 = 0.548$

Source : *Researcher's Survey*

The multiple regression analysis reveals that age, education and annual family income are significant predictors of the present use of digital transaction platforms among rural customers. Out of these three factors, annual family income emerged having strongest impact, followed by age and education.

Table 6 : Multiple Regression of Socio-Demographic Factors with Frequency of Using Digital Transaction Platforms in Case of Rural Customers.

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.111	0.036		3.103	0.002
Age	0.091	0.025	0.189	3.622	0.000
Education	1.462	0.097	0.166	15.108	0.000
Annual Family Income	0.109	0.021	0.276	5.535	0.000

N.B:- $r = 0.729$, $R^2 = 0.531$.

Source : *Researcher's Survey*

Age, education and annual family income emerged as significant predictors of frequency of using digital financial services in rural areas in the multiple regression analysis. In similar lines with present usage, annual family income emerged having strongest impact on frequency of usage followed by age and education.

Table 7: Multiple Regression of Social and Demographic Factors with Present Use of Digital Transaction Platforms in Case of Urban Customers

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.075	0.012		6.262	0.000
Age	0.025	0.007	0.175	3.788	0.000
Education	2.008	0.032	0.308	62.401	0.000
Annual Family Income	0.063	0.008	0.368	7.548	0.000

N.B:- $r = 0.759$, $R^2 = 0.576$.

Source : *Researcher's Survey*

The multiple regression analysis shows that age, education, and annual family income are significant predictors of adoption of digital financial services among urban population. Among these three factors, annual family income emerged having strongest impact, followed by education and age. This suggests that socio-economic status represented by annual family income and education levels play a critical role in dependent variable i.e. adoption of digital payment platforms.

Table 8: Multiple Regression of Socio-Demographic Factors with Frequency of Using Digital Transaction Platforms in Case of Urban Customers

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.092	0.046		2.027	0.044
Age	0.073	0.025	0.154	2.922	0.004
Education	1.311	0.122	0.114	10.74	0.000
Annual Family Income	0.171	0.031	0.301	5.396	0.000

N.B:- $r = 0.719$, $R^2 = 0.517$

Source : *Researcher's Survey*

The multiple regression analysis reveals that among urban customers, age, education, and annual family income are significant predictors of the frequency of usage of digital financial services. Among these three factors, annual family income has the strongest impact, followed by age and education. This suggests that socioeconomic status, in terms of income and education, plays an important role in how frequently urban customers use digital financial services.

Findings

The study revealed the following major findings:

- (i) Age, education and annual family income are three most critical socio-demographic factors influencing usage levels of digital transaction platforms in both rural and urban areas.
- (ii) Annual Family Income, as a factor, have exhibited strongest correlation with digital financial inclusion suggesting that with higher levels of income propensity to adopt as well as frequency of usage of digital payments would increase significantly.
- (iii) Education and Age have also emerged as important factors in digital financial inclusion in both rural and urban areas thereby suggesting that higher levels of education and also with maturity with higher age groups, the likelihood of usage and frequency of using digital transaction platforms increase.
- (iv) Gender, social stratification and occupation, the other three socio demographic factors showed weaker correlations indicating that influence of these factors on digital financial services adoption and their frequency of usage are minimal and are less pronounced when compared to education, age and annual family income.
- (v) Location is a less significant factor in adopting various digital financial services and there is no significant difference exist between rural and urban areas. However, for mobile wallets, significantly higher usage was observed in urban areas.
- (vi) People in urban areas are found exhibiting higher frequencies of usage, indicating a greater adoption of digital services. However, the same does not hold true for Credit Card/Debit Card and Pre-paid Card usage frequencies, suggesting usage patterns are almost similar in both rural and urban areas.
- (vii) The multiple regression analyses further revealed the combined effects of age, education and annual family income on present usage and frequency of usage of digital financial inclusion and underscore the significant predictive power of these three factors on adoption of digital financial services.

Managerial and Policy Implications

- (i) This study provides some valuable insights which can be utilized by policy makers to devise more focused approach centered around age, education and income. Specific awareness programmes and differentiated products around these socio-demographic parameters would aid in furtherance of usage levels of digital financial services.

- (ii) As digital financial services were found to have higher penetration in urban areas, specific measures and concerted efforts are needed to spread awareness, remove bottlenecks in rural areas for enhanced usage. In this regard, safety and security apprehensions also needs to be effectively addressed to infuse confidence among rural population.
- (iii) Mobile wallets garnering much acceptance in urban areas compared to rural areas. Awareness drives and specific measures are needed to popularize the same among rural population and bridge the gap.
- (iv) Considering gender emerging as a weaker factor, overemphasis on gender specific financial products may be moderated.
- (v) As education and income emerge as strong factors, Government and policy makers need to tailor their strategies to enhance economic levels and improving educational opportunities.

Conclusion

Across the globe, the financial inclusion is touted as a transformative tool to rescue individuals and households out of financial exclusion and economic backwardness. The importance of digital financial inclusion, therefore, is continuously growing owing to it's increasing influence on individuals, fostering economic growth, alleviating poverty, fortifying financial stability and significantly contributing to inclusive and sustainable development. This study was carried out aiming to investigate and analyse the factors which impact the current usage of digital payments in state of Odisha and usage frequency by the customers. The study has provided valuable insights into the socio-demographic determinants and their association with adoption of digital financial services. The study brought out some interesting findings. The statistical analysis of the collected data reveals that annual income, education and age are the crucial factors having significant influence on level of digital financial inclusion whereas factors like gender, occupation and social stratification were found to be weakly associated. The study further reveals that adoption of digital payment channels is not exactly an urban phenomena and rural areas are also not far behind in embracing the same, albeit with varied usage levels. The valuable insights obtained from the study would help the policymakers and financial institutions in targeted financial approach and interventions, customized financial products and formulating strategies to expand the digital footprints across all the regions that would ultimately aid in overall economic development of the State. However, considering the study was limited to only eight districts of Odisha, a state-wide study is recommended to further substantiate the findings and accordingly tailor the governmental, regulatory and institutional policies.

References

- Acharya, D. & Pandey, A.K., 2023.** India's CBDC needs to be people-centric. Institute for Money, Technology and Financial Inclusion. Available at: https://www.imtfin.uci.edu/research/2022/indias_cbdc_needs_to_be_peoplecentric_acharya.php [Accessed 3 October 2024].
- Behera, R.R., Saroy, R. & Dhal, S., 2023.** Digital payments in urban Odisha: Insights from a primary survey. *Review of Development and Change*, 28(2), pp.141-165.
- Herwadkar, S., Verma, R. & Bilantu, P., 2019.** Drivers of digital payments: A cross-country study. *Reserve Bank of India Bulletin*, 73(8). Available at: https://www.rbi.org.in/Scripts/BS_ViewBulletin.aspx?Id=18409 [Accessed 3 October 2024].
- Joshi, M.C., 2017.** Digital payment system: Before, during and after demonetisation. *International Journal of Banking, Accounting and Finance*, 2(December), pp.1-14.
- Kulkarni, S. & Varma, A.J., 2021.** A literature study of consumer perception towards digital payment mode in India. *Psychology and Education Journal*, 58(1), pp.3304-3319.
- Kumar, K. & Muhota, K., 2012.** Can digital footprints lead to greater Financial Inclusion. *Briefing Note*. Washington, D.C.: CGAP.
- Lauer, K. & Lyman, T., 2015.** Digital financial inclusion: Implications for customers, regulators, supervisors, and standard-setting bodies. *CGAP*.
- Mihna, Z. & Behrooz, G., 2015.** Adoption of internet banking in Maldives: The most important determinants. *Asian Social Science*, 11(2), pp.181-189.
- Ozili, P.K., 2018.** Impact of digital finance on financial inclusion and stability. *Borsa Istanbul Review*, 18(4), pp.329-340.
- Ozili, P.K., 2021.** Digital finance, green finance and social finance: Is there a link? *Financial Internet Quarterly*, 17(1), pp.1-7.
- Ozili, P.K., 2022.** Digital financial inclusion. *Emerald Studies in Finance, Insurance, and Risk Management*. Leeds: Emerald Publishing Limited, pp.229-238. Available at: <https://doi.org/10.1108/978-1-80262-605-620221015> [Accessed 3 October 2024].
- Paul, S., 2013.** The adoption of electronic banking in Odisha. *International Journal of Scientific & Technology Research*, 2(5), pp.258-262.
- Reserve Bank of India, 2019.** National Strategy for Financial Inclusion 2019-24. Available at: <https://rbidocs.rbi.org.in/rdocs//PublicationReport/Pdfs/NSFIREPORT100119FF91DAA6B73B497A923CC11E0811776D.PDF> [Accessed 3 October 2024].
- Tiwari, T., Srivastava, A. & Kumar, S., 2019.** Adoption of digital payment methods in India. *International Journal of Electronic Finance*, 9(3), pp.217-229.

Global Perspectives in Agricultural Commodity Futures Research: A Comprehensive Literature review and Bibliometric Analysis

Mrs Jenefer John
Ph.D. Research Scholar,
Alagappa Institute of
Management, Alagappa
University, Karaikudi, India

Dr. S. Rajamohan
Senior Professor & Director,
Alagappa Institute of
Management, Alagappa
University, India

Mr Anand Bharathi
Ph.D. Research Scholar,
Alagappa Institute of
Management, Alagappa
University, India

Abstract

This Research conducts a pioneering bibliometric analysis of Agricultural Commodity Futures literature, focusing on 110 papers published between 1992 and 2023. Employing various bibliometric techniques, the study aims to identify key themes, assess the current state of Agricultural Commodity Futures research, and understand the influence of significant works through performance analysis, co-citation analysis, bibliographic coupling, and scientific mapping. Noteworthy findings include the most productive years being 2015 and 2017, the University of South Australia and Pusan National University as impactful institutes, and the United States as the most influential country in Agricultural Commodity Futures research. 'Energy Economics' emerges as the most influential journal, and the most cited article focuses on "dynamic spillover effects among crude oil, precious metals, and agricultural commodity futures markets". On average, each Agricultural Commodity Futures paper involves 1.95 authors with a collaboration index of 30. Leading contributors include China and the USA. The study identifies four thematic clusters within Agricultural Commodity Futures research, providing valuable insights for researchers and outlining potential future research directions, thereby contributing significantly to the understanding and advancement of Agricultural Commodity Futures literature.

Keywords: Agricultural Commodity Futures, Bibliometric Analysis, Co-citation Analysis, Bibliographic Coupling

Introduction

Agricultural commodity futures markets serve as a foundational pillar within the global agricultural industry, functioning as a crucial mechanism for producers, consumers, and investors to manage risk, discover price information, and ensure the efficient allocation of resources (Borin & Di Nino, 2012; Bargawi & Newman, 2017; Inani, 2018). The far-reaching significance of these markets extends beyond agriculture, influencing economic stability, food security, and global trade (Liverman & Kapadia, 2012; Campbell et. al., 2016). Recognizing the pivotal role of futures in shaping our interconnected world, it becomes imperative for academics, researchers, policymakers, market participants, and stakeholders across agricultural and financial sectors to comprehend the extensive body of research in this field.

This research paper embarks on a comprehensive exploration of the literature surrounding agricultural commodity futures, utilizing both bibliometric analysis and literature review methodologies. Our primary goal is to provide a systematic and rigorous assessment of existing research, aiming to highlight key trends, seminal contributions, and knowledge gaps that have significantly contributed to our understanding of these markets.

The relevance of agricultural commodity futures becomes even more apparent in the face of the ever-changing global agriculture and finance landscape (Borch, 2007). Challenges arising from climate change, shifting consumer preferences, and geopolitical dynamics elevate the stakes for supply chain stakeholders (Basu, 2023; Lund et al., 2020). These challenges, coupled with the emergence of innovative financial instruments and technological advancements, necessitate a thorough examination of academic research. This research not only informs decision-making processes for market participants but also guides policymakers in navigating the evolving landscape of agricultural commodities.

Commencing with a historical perspective, this paper traces the evolution of commodity futures markets, showcasing their emergence as indispensable risk management tools for both agricultural producers and consumers. We delve into the intricacies of these markets, scrutinizing their functioning, the roles played by participants, and the driving forces influencing their growth and development. Subsequently, our bibliometric analysis unveils trends in research output, identifies the most influential authors and journals, and reveals the thematic breadth of the literature, shedding light on the knowledge networks that have evolved in this field.

As we navigate the current literary landscape of agricultural commodities, we address key themes, including risk management, price efficiency, speculation, and the impact of regulatory changes. This exploration provides a nuanced perspective on the contributions and controversies that have marked this discipline. Additionally, we consider the global perspective, examining the contributions of various regions and the extent to which cultural, economic, and institutional differences shape the research agenda.

Moreover, we meticulously identify gaps and opportunities within the existing literature, offering insights into areas that warrant further exploration to meet the evolving challenges and opportunities within agricultural commodity markets. Our analysis aspires to serve as a valuable resource for researchers navigating this complex and dynamic field, as well as for practitioners and policymakers seeking to make informed decisions in the ever-changing landscape of agricultural commodities.

In an era marked by increasing complexity in agricultural markets and the global financial landscape (Held et al., 1999; Mueller et al., 2021), this study underscores the importance of consolidating and synthesizing the body of knowledge surrounding agricultural commodity futures. We aim to facilitate a deeper understanding of the dynamics, risks, and opportunities within these markets and to encourage continued exploration in this critical domain. Ultimately, our contributions aim to enhance the robustness and resilience of the global agricultural industry and financial markets alike.

Background Of The Study

In the realm of academic inquiry, agricultural commodity futures (ACF) have served as a pivotal subject within the broader context of global trade and economic systems (Li et al., 2022). These financial instruments play a fundamental role in mitigating risk for agricultural producers, facilitating price discovery, and ensuring the efficient allocation of resources within the agricultural sector (Ali & Bardhan Gupta, 2011; Rao, 2015; Isakson, 2017). Given the contemporary challenges of food security, climate change, and market volatility, a comprehensive understanding of the body of knowledge surrounding agricultural commodity futures becomes increasingly imperative.

The historical trajectory of agricultural commodity futures can be traced back to the mid-19th century, originating in the United States as tools designed to assist farmers and merchants in managing price risks associated with agricultural production and trade (Pinzur, 2016; Saleuddin, 2017). Over time, these markets have evolved into a complex global system, subject to in-depth exploration in the literature. Research has delved into the historical significance of these markets and the development of regulatory frameworks that govern them (Farrell & Newman, 2010; Balleisen & Brake, 2014).

Price discovery stands out as a core function of agricultural commodity futures markets, with extensive studies examining the efficiency and effectiveness of these markets in determining fair prices for agricultural commodities (Mattos & Garcia, 2004; Aggarwal et al., 2014; RL & Mishra, 2020). Additionally, these markets serve as essential tools for risk management, a facet extensively scrutinized in research exploring their role in mitigating price volatility and ensuring the stability of the agricultural sector (Allioui & Mourdi, 2023; Farooq et al., 2022).

As the global population burgeons and climate change disrupts traditional agricultural practices, the significance of commodity futures in shaping agricultural production practices and sustainability becomes increasingly crucial (Fleming & Vanclay, 2010; Clapp & Helleiner, 2012; Buttel, 2013). The literature delves into how these markets influence decisions made by farmers, agribusinesses, and policymakers, thereby impacting the agricultural landscape and its long-term sustainability.

Market dynamics, including the role of speculators in shaping behaviour, have been subject to scrutiny, as has the impact of regulations and policies on market participants and outcomes (Petry et al., 2023; Williams, 2013). The ever-changing global landscape introduces emerging trends in agricultural commodity futures, such as the integration of technology, the influence of ESG factors, and the implications of globalization on these markets (Lo, 2021).

The roots of agricultural commodity futures markets, extending back to ancient civilizations, underscore their enduring importance in supporting agricultural activities (Pollock, 1992; Fairbairn, 2020). In the contemporary context, these markets have grown significantly, propelled by advances in transportation, communication, and financial innovations (Chui, 2012).

Emerging trends in agricultural commodity futures markets are intricately linked to environmental and sustainability issues (Noe & Alrøe, 2015). The adoption of advanced technologies, regulatory changes, and the global context shapes the contemporary landscape (Knickel et al., 2017). Blockchain, data analytics, and algorithmic trading are reshaping these markets, enhancing transparency, reducing transaction costs, and

broadening market access (Weber et al., 1999; Rejeb et al., 2020; Ababouch et al., 2023; Hidalgo et al., 2023). The efficiency of these markets remains a key area of research, exploring the extent to which futures reflect all available information, as posited by the Efficient Market Hypothesis (Konstantinidis et al., 2012). Speculators, crucial to the liquidity of agricultural commodity futures markets, contribute to both market efficiency and ongoing debates about their impact on price volatility (Ghosh et al., 2012; Will et al., 2015). Research has assessed the effectiveness of futures markets in mitigating risks for agricultural producers, revealing varying outcomes influenced by factors such as commodity type, market structure, and participant profiles (Ullah et al., 2016; Kalogeras et al., 2012).

However, to the best of our knowledge, currently there is no scientific and comprehensive analysis of ACF in the research field based on quantitative and statistical perspective. Therefore, we propose a bibliometric analysis of ACF to comprehensively map the landscape of this research field. Specifically, this paper addresses the following research question:

RQ1: What are the key authorship patterns, collaboration dynamics, publication trends, and thematic structures in Agricultural Commodities Futures Research? Furthermore, how do these factors, along with the contributions of prominent authors and influential articles, evolve over time to inform the future directions of this field?

To answer these research questions, this study conducts a bibliometric analysis on academic publications in this field during the period 1992–2023 to explore the general publication distributions, reveal the collaboration relations, discover trending keywords and analyze major research themes and their evolutions.

Methodology

In the present study, the formulation of precise search terms is of utmost importance to achieve comprehensive coverage of the diverse facets within the field of Agricultural Commodity Futures. To facilitate this, we relied on the exact match keyword, specifically “Agricultural Commodity Futures,” ensuring inclusivity of all relevant components.

Article Inclusion and Exclusion Criteria

Table 1: Article Inclusion and Exclusion Criteria

Selection Criteria	Exclude	Include
Search Engine: Scopus		
Date of Search: 01 August 2023		
Period of Publications: 1992 - 2023		
Search Term: (“Agricultural Commodity Futures”)	-	155
Subject Area: “Business Management and Accounting”, “Social Sciences”, “Economics, Econometrics and Finance”, “Arts and Humanities”	34	121
Document Type: “Articles” and “Reviews”	7	114
Article Selection		
Language Screening: “Include documents in English only”	3	111
Erroneous refine record: Include documents with valid author, title, abstract etc	1	110

Source: Developed by the authors based on Scopus Database

Table 1, presented in this study, outlines the criteria used for the inclusion and exclusion of articles. This framework served as a guideline to meticulously select articles that align with the study's objectives. Our primary data source was the Scopus database, acknowledged for its comprehensive coverage of double-blind peer-reviewed publications in high-impact factor journals, surpassing the coverage provided by the Web of Science. A systematic approach was adopted to retrieve 110 articles, as depicted in Table 1. We employed specific keywords such as “Agricultural Commodity Futures” to filter for English-language articles from diverse disciplines but limited the data extraction from Scopus to articles published from 1992 onwards.

It is imperative to acknowledge that online databases, like Scopus, may contain inaccuracies stemming from incorrect bibliographical and bibliometric information due to subsequent publications. To mitigate this risk, we implemented a series of data refinement procedures in accordance with recommended methodologies. Furthermore, we harnessed the power of natural language processing tools within the VOS viewer software and Biblioshiny, allowing us to cleanse and standardize terms extracted from article titles, abstracts, and author-specific keywords, thereby enhancing data quality and analysis accuracy.

Recognizing the value of bibliometric analysis as a pivotal quantitative tool for a comprehensive exploration of available information, we deployed this approach extensively. It enabled us to identify key sources of knowledge, map the dissemination of ideas, and highlight influential works within the field, thereby enriching scholarly discourse. In pursuit of this goal, we employed a thoughtful selection of techniques. This approach provided essential context to the research landscape, offering insights into the historical development and influential personalities who have shaped the domain. Subsequently, we delved into various bibliometric analysis techniques, encompassing authorship analysis, citation analysis, bibliographic coupling, co-citation analysis, and co-word analysis. By integrating these methodologies, we were able to extract invaluable insights from the bibliographic data, uncovering connections, patterns, and trends within the scholarly corpus.

Findings

Summary Statistics:

Table 2: Summary Statistics

Description	Results
Documents	110
Sources (Journals, Books, etc)	74
Keywords Plus (ID)	198
Author's Keywords (DE)	310
Period	1992:2023
Average citations per document	18.43
Authors	215
Authors of single-authored docs	15
Authors of multi-authored docs	200
Single-authored docs	16
Documents per Author	0.511
Authors per Document	1.954
Co-Authors per Doc	2.52
Collaboration index	30

Source: Developed by the authors based on Scopus Database

In this comprehensive investigation, we delved into a total of 110 documents that spanned the years from 1992 to 2023. These documents were meticulously curated from a diverse array of 74 reputable sources, including academic journals, books, and other scholarly publications. Our analysis unearthed an average of 18.43 citations per document, underscoring the substantial recognition and influence that these works have garnered within the academic community.

This exhaustive scrutiny also unveiled 215 distinctive authors who made notable contributions to the realm of Agricultural Commodity Futures (ACF) over the designated timeframe. Noteworthy among our findings was the presence of 15 single-authored documents, juxtaposed with 200 multi-authored documents, indicating a harmonious blend of both collaborative and solitary research endeavours. On average, each document entailed the contributions of 1.95 authors, illustrating a predominant inclination towards collaborative research practices in the field of ACF.

Conversely, each author was found to have played a role in approximately 0.511 documents, signifying a commendable level of individual research productivity. A more in-depth exploration of the data further unveiled an average of 2.52 co-authors per document, pointing towards a strong culture of cooperation and mutual engagement within the ACF domain. The calculated collaboration index, standing at an impressive 30, underscores the significance of joint research undertakings and team-based projects among the scholarly community.

These results illuminate the dynamic and evolving nature of research in Agricultural Commodity Futures. The substantial number of citations, as well as the high degree of author collaboration, exemplify the increasing impact and collective commitment of researchers in advancing knowledge within this domain. The coexistence

of both single-author and multi-authored documents reflects a healthy amalgamation of independent scholarship and interdisciplinary teamwork, contributing to the overall diversity and depth of research in ACF.

Contribution by countries:

Country Collaboration Map

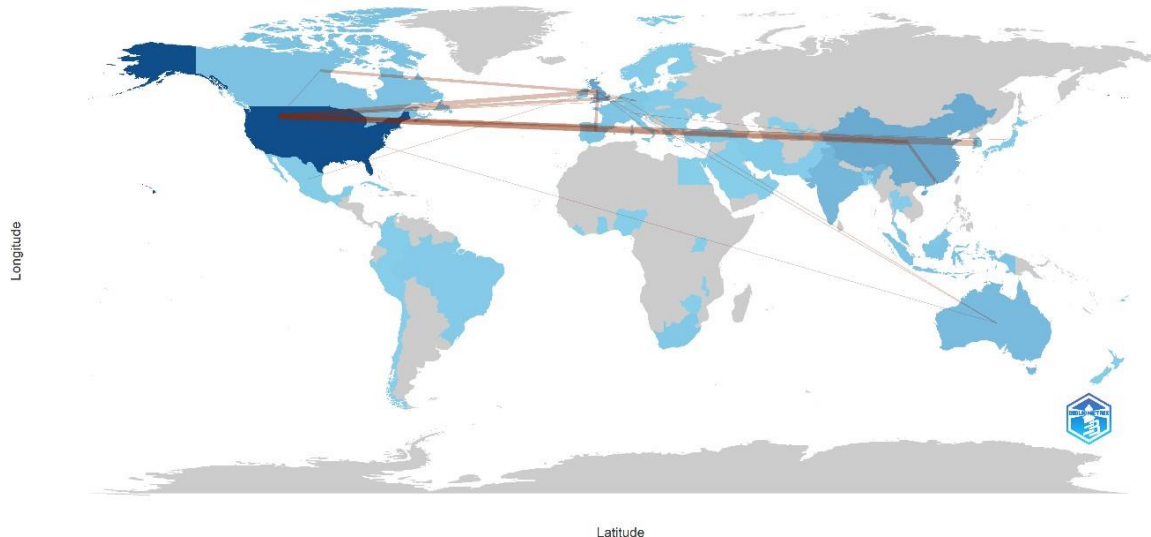


Figure 1. Country Collaboration Map

Source: Developed by the authors based on Scopus Database on R(Bibliometrix)

In examining the research contributions of various countries in the domain of Agricultural Commodity Futures (ACF), our bibliometric analysis has unveiled several noteworthy trends. China emerges as the most prolific contributor, with a remarkable total of 59 articles, underscoring its dominant role in the realm of ACF research. Following closely behind, the United States secures the second position with 51 articles, signifying its escalating influence within the field. India and Australia also emerge as notable contenders, with 35 and 23 articles, respectively, demonstrating their substantial contributions to ACF research. Interestingly, India secures the third position with 35 papers, revealing its active involvement in the burgeoning field of ACF research.

It is crucial to highlight that, despite India's third-place ranking in terms of overall article contributions, its authors secure the ninth position in terms of the Most Cited Papers (MCP). This suggests that the research originating from India carries a significant impact and influence within the field. Furthermore, Germany and the United Kingdom also exhibit substantial contributions to ACF research, while other nations, including Thailand, South Africa, France, Sweden, South Korea, Canada, Colombia, Japan, Switzerland, and Turkey, maintain more moderate levels of research output.

Our analysis delves deeper into collaboration patterns among researchers from different countries, revealing expected outcomes. China, the United States, and India, being the top contributors, naturally exhibit a higher propensity for collaborative efforts among researchers from these nations. When we view this from a continental perspective, North America, Asia, and Europe collectively contribute the most to ACF research. In contrast, countries such as Austria, Belgium, Greece, Mexico, Netherlands, Serbia, Spain, Denmark, New Zealand, Pakistan, Portugal, and Saudi Arabia exhibit limited contributions to the field.

Performance analysis

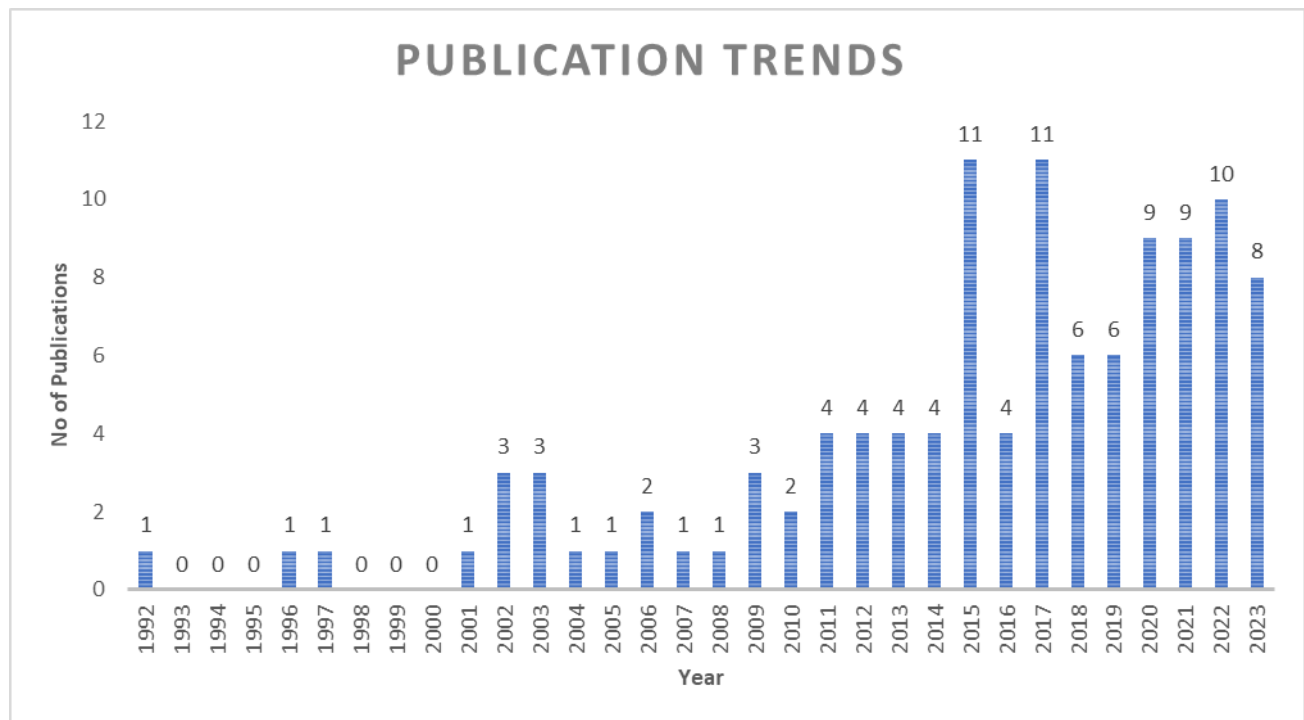


Figure 2. Publication Trends

Source: Developed by the authors based on Scopus Database on R(Bibliometrix)

The provided bar chart illustrates the trends in publications within the realm of Agricultural Commodity Futures (ACF) research. Notably, the years 2015 and 2017 emerge as the most prolific periods, as depicted in Figure 2. However, it is essential to acknowledge that the journey of research in this domain commenced with the groundbreaking work of (Frank, 1992). The initial trajectory of research in this field reveals a predilection for the term "Agricultural Commodity Futures." Commencing around 2010, there has been a gradual uptick in the prevalence of ACF research, and since 2015, there has been a pronounced surge in annual production rates. In light of the current trajectory, it is reasonable to anticipate a sustained growth in the study of ACF in the forthcoming years.

Prominent authors, organizations, and countries for ACF research

Table 3 Most influential authors, organizations, and countries

TC	Author	TP	TC	Organization	TP	TC	Country	TP
318	Kang S.H.	1	318	University of South Australia, Australia	1	550	China	24
133	Luo J.	1	318	Pusan National University, South Korea	1	490	United States	28
129	Sørensen C.	1	318	Pusan National University, South Korea	1	458	Australia	14
93	Mckenzie A.M.	1	160	South China University of Technology, China	2	362	South Korea	4
84	Xiong T.	1	133	Chinese Academy of Sciences, China	1	170	United Kingdom	10
76	Clapp J.	1	133	University of Chinese Academy of Sciences, China	1	137	Denmark	2
73	Tian F.	2	129	Copenhagen Business School, Denmark	1	136	Canada	4
71	Wang H.H.	1	93	University of Arkansas, United States	1	118	Sweden	4
70	Garcia P.	1	93	North Carolina State University, United States	1	101	India	18
56	Kavussanos M.G	1	84	Huazhong Agricultural University, China	1	96	France	4
54	Sensoy A	1	84	Huazhong University of Science and Technology, China	1	62	Turkey	3
48	Ali J.	1	76	University of Waterloo, Canada	1	57	Greece	2
44	Elder J.	2	71	Washington State University, United States	1	49	Germany	5
41	Mo D.	1	70	Univ. Illinois at Urbana-Champaign, United States	1	41	Portugal	3
38	Nguyen D.K.	1	70	Univ. Illinois at Urbana-Champaign, United States	1	37	Netherlands	3
31	Fang Y.	1	61	Sun Yat-Sen University, China	1	24	Japan	4
29	Bohl M.T.	1	61	Sun Yat-Sen University, China	1	24	Spain	2
27	Luo J.	1	61	South China University of Technology, China	1	18	Thailand	4
27	Yang J.	1	56	Athens University of Economics and Business, Greece	1	16	South Africa	4
25	Ouyang H.	1	56	World Maritime University, Sweden	1	11	Switzerland	2

Source: Developed by the authors based on Scopus Database

Note(s): TC = "total citations". TP = "total publications"

In Table 3, an overview of the most influential authors, institutions, and countries in the field of Agricultural Commodity Futures (ACF) research is presented. Kang S.H. emerges as the most influential author, boasting 318 citations and one research paper publication. Luo J. has also made significant contributions, with one document published and 133 citations to their name. In the realm of institutions, the 'University of South Australia' and 'Pusan National University' stand out as the most influential, each accumulating 318 citations with one document publication. Following closely behind is the 'South China University of Technology,' with 160 citations and one document publication for each. In terms of countries, China leads the pack as the most influential, with a substantial 550 citations stemming from 24 documents. The United States follows closely, amassing 490 citations from 28 documents. Australia has also made a notable contribution, publishing 14 documents with a total of 458 citations. Moreover, it is worth noting that the United States demonstrates its prolificacy in ACF research, emerging as the most productive country in this field.

Relationship between authors, keywords and sources:

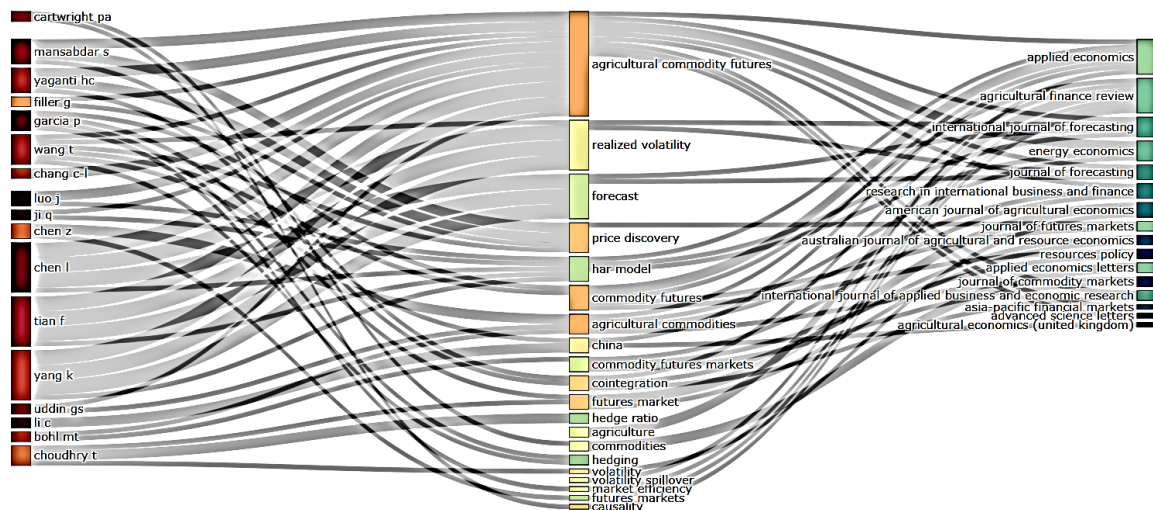


Figure 3. Three field analysis in ACF

Source: Developed by the authors based on Scopus Database on R(Bibliometrix)

In Figure 3, we conducted a comprehensive analysis of the field, focusing on the interplay between authors, keywords, and sources. The graphical representation of this analysis displayed in Figure 3 comprises three distinct columns: the left column featuring author names, the middle column housing keywords, and the right column listing the respective journal names. Our investigation unveiled a striking pattern in the selection of keywords by authors within the field. A substantial proportion of authors prominently opted for the keyword "agricultural commodity futures" as the linchpin of their research endeavours. Notwithstanding this dominant preference, our scrutiny also detected the frequent use of closely related keywords, such as "realized volatility," "forecast," "price discovery," "har model," "commodity futures," and "agricultural commodities," among various other variations, in the context of different research articles. It is imperative to note that authors who elected to focus on "agricultural commodity futures" as their primary keyword commonly intertwined these related terms throughout their scholarly works. Nonetheless, the data unmistakably indicates a pronounced emphasis on "agricultural commodity futures" when juxtaposed with alternative keywords. This emphasis may be attributed to the pervasive adoption and prevalence of Agricultural Commodity Futures (ACF) practices as the preferred semantic terminology to convey analogous concepts.

An opportunity for further exploration beckons through the application of Influential topics. This analytical framework categorizes keywords into four quadrants, as detailed in Figures 6, 7, 8, and 9, and ranks them based on their historical and current preference. A deeper dive into this methodological approach could offer valuable insights into the evolving dynamics of keyword utilization within the field. Turning our attention to the sources, our findings suggest a balanced distribution of research contributions across various journals, indicating a widespread interest in Agricultural Commodity Futures (ACF) research. However, certain journals, notably "Applied Economics" and the "Journal of Futures Market," emerge as trailblazers and instrumental in advancing the body of knowledge within this domain. Their distinct prominence reflects their significance in shaping and propelling the discourse in the field of Agricultural Commodity Futures.

Performance of academic journals:

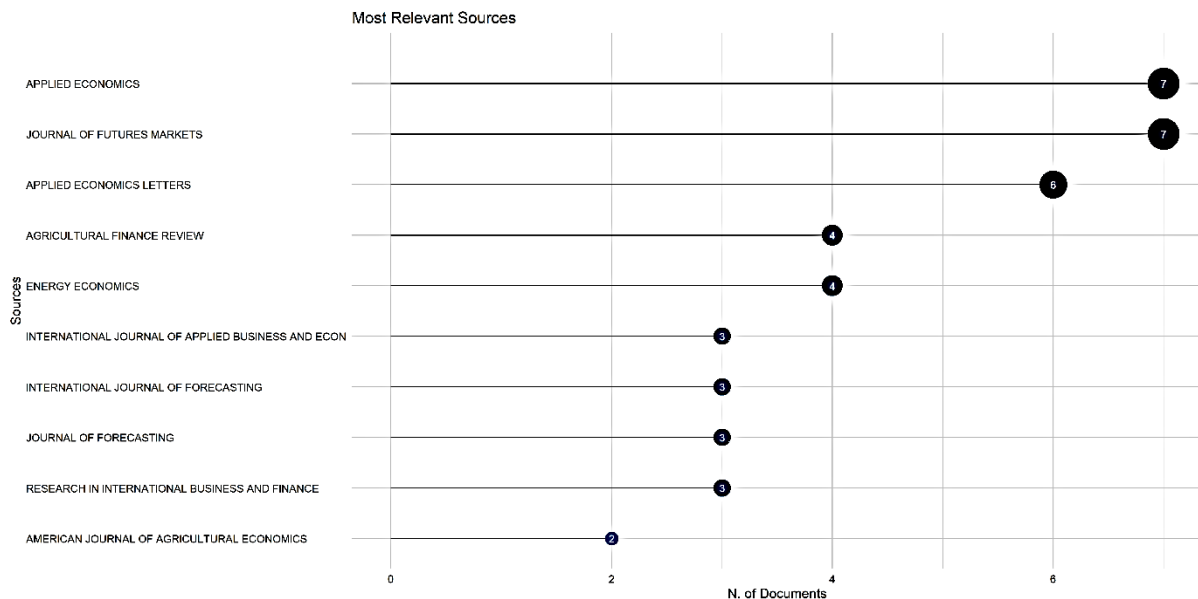


Figure 4: Most contributing journal in ACF

Source: Developed by the authors based on Scopus Database on R(Bibliometrix)

The research endeavour sought to identify the most influential academic journals in the realm of Agricultural Commodity Futures (ACF). The outcomes of this investigation have been thoughtfully illustrated in Figure 4. Notably, the “Applied Economics and Journal of Futures Market” demonstrated their supremacy as leading contributors, boasting the publication of 7 research papers each during the specified period. This substantial productivity underscores the substantial impact and influence that these journals wield within the ACF domain. Closely following this formidable duo was the journal “Applied Economics Letter,” which made a noteworthy contribution by publishing 6 articles, clearly signalling its role in advancing sustainable ACF practices. Additionally, two other journals, namely “Agricultural Finance Review” and “Energy Economics,” each published 4 articles, thereby cementing their significant roles in disseminating research within this field. It is intriguing to note that, despite accumulating substantial citation counts, such as the impressive 475 citations amassed by “Energy Economics,” these journals found themselves ranked relatively lower on the list, holding the 5th position, respectively. These findings raise a pertinent question that warrants further investigation: why does a noticeable gap exist between citation counts (as exemplified in Table 4) and the journal rankings concerning the number of published articles? This incongruity suggests that, despite their high citation counts, some journals may not be actively publishing research related to ACF, while other journals with lower citation counts may be making significant, albeit potentially underappreciated, contributions in the field. To gain deeper insights into journal performance and impact, it is recommended to cross-reference these findings with renowned journals and their publications. Such an approach could provide a more comprehensive understanding of the scholarly landscape within ACF. As diligent researchers, it is crucial to consider these findings when selecting the most relevant journals for keeping abreast of the latest advancements and contributing to the growth of knowledge in the ever-evolving field of ACF.

Most influential journals for ACF research

Table 4 Most influential journals for ACF research

Journals	TC	FIN	ECO	TP	ABDC	1992-1998	1999-2005	2006-2012	2013-2019	2020-2023
Energy Economics	475		X	4	NA				2	2
Journal of Futures Markets	226			7	A*		2	2	2	1
Applied Economics	121		X	7	NA		1	1	1	4
International Journal of Forecasting	111			3	A				1	2
Knowledge-Based Systems	84			1	A				1	
Australian Journal of Agricultural and Resource Economics	80		X	2	A		1		1	
Third World Quarterly	76			1	NA			1		
European Review of Agricultural Economics	70		X	1	A		1			
Agricultural Finance Review	58	X		4	A			2	2	
Transportation Research Part E: Logistics and Transportation Review	56			1	C				1	
Resources Policy	54			2	A*				1	1
Journal of Forecasting	50			3	B				1	2
Applied Economics Letters	49		X	6	A		2	2	1	1
Economic Modelling	41			1	B				1	
Finance Research Letters	38	X		1	A				1	
Journal of Asian Economics	29		X	1	A				1	
International Review of Economics and Finance	25	X	X	1	B				1	
Journal of Applied Economics	25		X	1	NA				1	
Global Policy	24			1	B				1	
International Review of Financial Analysis	24	X		1	NA			1		

Source: Developed by the authors based on Scopus Database

Note(s): ABDC = "Australian Business Deans Council 2022 Journal Rank List". TC= "Total Citations". TP = "Total Publications". FIN = "X if a journal is classified as Finance" "ECO = X if a journal is classified as Economics"

The information presented in Table 4 provides a comprehensive overview of the significant sources of research in the field of Agricultural Commodity Futures (ACF) and their respective impact. Notably, "Energy Economics" emerges as the most influential source in this field, with a substantial 475 citations and 4 publications. Following closely is the "Journal of Futures Markets," which boasts 226 citations and a noteworthy 7 publications. In terms of productivity, "Applied Economics" and "Journal of Futures Markets" stand out, each contributing 7 publications. Additionally, "Energy Economics" exhibits high productivity with 4 publications. The period spanning from 2013 to 2019 appears to be the peak of productivity, particularly in the most influential journals. During this time frame, researchers contributed significantly to the body of knowledge in ACF. Noteworthy distinctions include the recognition of the "Agricultural Finance Review" as the most influential finance journal in the field, while "Applied Economics" takes the accolade for being the most influential economics journal. The "Journal of Futures Markets" distinguishes itself as the most productive non-finance and economics journal, making substantial contributions to the ACF literature. An interesting observation is that while research in ACF research commenced in 1992, it wasn't until the year 2000 that publications in high-quality journals began to appear. A critical point to highlight is the absence of publications in the most influential journals between 1992 and 1998, indicating a significant development in the recognition and dissemination of ACF research within academic circles during this period.

Most influential articles on ACF research

Table 5 Most influential articles on ACF research

Authors	Title	TC
Kang S.H et al. (2017)	"Dynamic spillover effects among crude oil, precious metal, and agricultural commodity futures markets"	318
Luo J and Ji Q. (2018)	"High-frequency volatility connectedness between the US crude oil market and China's agricultural commodity markets"	133
Sørensen C. (2002)	"Modeling Seasonality in Agricultural Commodity Futures"	129
Mckenzie A.M and Holt M.T. (2002)	"Market efficiency in agricultural futures markets"	93
Xiong T et al. (2015)	"A combination method for interval forecasting of agricultural commodity futures prices"	84
Clapp J. (2009)	"Food price volatility and vulnerability in the global South: Considering the global economic context"	76
Wang H.H and Ke B. (2005)	"Efficiency tests of agricultural commodity futures markets in China"	71
Garcia P and Leuthold R.M. (2004)	"A selected review of agricultural commodity futures and options markets"	70
Tian F et al. (2017)	"Realized volatility forecasting of agricultural commodity futures using the HAR model with time-varying sparsity"	61
Kavussanos M.G et al. (2014)	"Economic spillovers between related derivatives markets: The case of commodity and freight markets"	56
Sensoy A et al. (2015)	"Dynamic convergence of commodity futures: Not all types of commodities are alike"	54
Ali J and Gupta K.B. (2011)	"Efficiency in agricultural commodity futures markets in India: Evidence from cointegration and causality tests"	48
Mo D et al. (2018)	"The macroeconomic determinants of commodity futures volatility: Evidence from Chinese and Indian markets"	41
Nguyen D.K et al. (2015)	"Testing for asymmetric causality between U.S. equity returns and commodity futures returns"	38
Elder J and Jin H.J. (2007)	"Long memory in commodity futures volatility: A wavelet perspective"	31
Fang Y et al. (2020)	"Optimal forecast combination based on ensemble empirical mode decomposition for agricultural commodity futures prices"	31
Bohl M.T et al. (2018)	"Speculative activity and returns volatility of Chinese agricultural commodity futures"	29
Luo J et al. (2022)	"Forecasting realized volatility of agricultural commodity futures with infinite Hidden Markov HAR models"	27
Yang J and Awokuse T.O. (2003)	"Asset storability and hedging effectiveness in commodity futures markets"	27
Yang K et al. (2017)	"Realized volatility forecast of agricultural futures using the HAR models with bagging and combination approaches"	25

Source: Developed by the authors based on Scopus Database

Note(s): "TC = total citations"

Table 5 offers a comprehensive compilation of the most highly cited and influential articles within the domain of Agricultural Commodity Futures (ACF) research. One noteworthy contribution is the article titled "Dynamic Spillover Effects Among Crude Oil, Precious Metal, and Agricultural Commodity Futures Markets" authored by (Kang et al., 2017) which has garnered an impressive 318 citations, establishing it as a seminal work in this field. This study illuminates novel insights into the transmission of information and interconnections across diverse commodity markets. It accentuates the heightened positive correlations that emerge during periods of financial crises, underscores the bidirectional flow of spillover effects, and underscores the pivotal roles of gold and silver as crucial information transmitters. The findings hold profound implications for investment decision-making and portfolio strategies, especially in the context of turbulent market conditions. Investors and portfolio managers can effectively leverage these findings to augment their decision-making processes and enhance risk management strategies.

Another significant study within this framework is conducted by (Luo & Ji, 2018), in their publication titled "High-Frequency Volatility Connectedness Between the US Crude Oil Market and China's Agricultural Commodity Markets." This study sheds light on the dynamic characteristics of volatility connectedness between the US crude oil futures market and the agricultural commodity futures markets in China. While this research uncovers evidence of spillover effects, it is crucial to note that these spillovers exhibit a relatively weak nature. Furthermore, the study underscores the necessity of considering the asymmetric attributes of volatility transmission, with specific attention to the amplified interdependence observed during periods of negative volatility. These observations have profound implications for devising effective risk management strategies and optimizing investment approaches in this context.

Knowledge foundations of ACF research through co-citation analysis

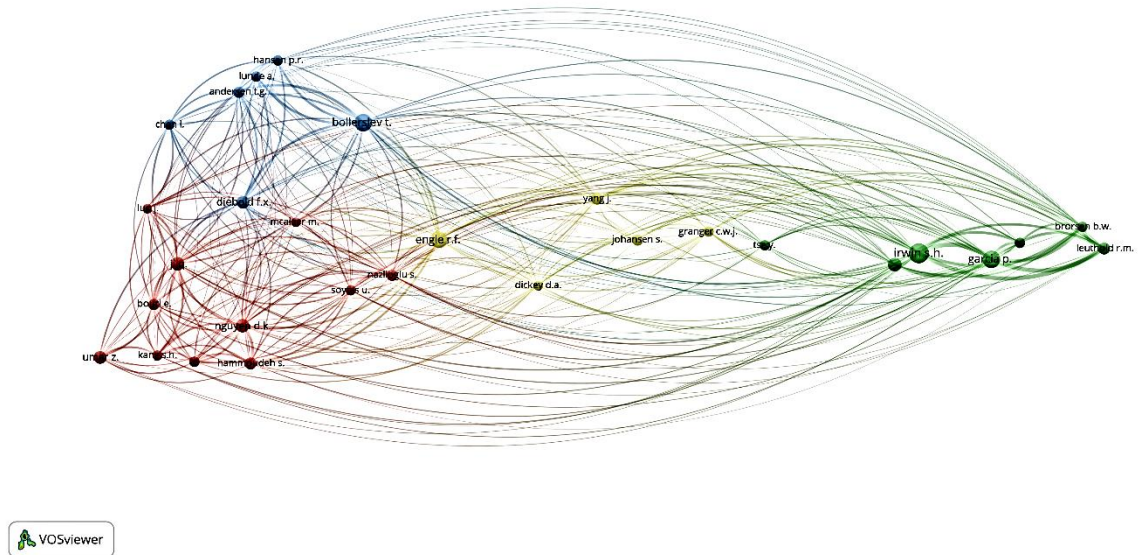


Figure 5. Co-citation of references cited by articles on ACF research

Source: Developed by the authors based on Scopus Database on R and VOS Viewer

Note(s): “A cited reference and a semantic cluster of references based on theme similarity are represented by each node. The degree of local citations is represented by the size of nodes, with larger nodes reflecting a higher intensity of local citations. Co-citations are represented by the link between nodes. The degree of co-citations is represented by the size of the link between nodes, with thicker linkages indicating more co-citation intensity.”

Utilizing co-citation analysis, our research uncovers a profound revelation, unveiling the intricate web of semantic correlations woven among co-cited references. This innovative approach provides invaluable insights into the very foundation of knowledge that forms the cornerstone of a specific academic field (Donthu et al., 2021; Goel & Kaur, 2021; Zhang et al., 2022; Nandan & Soni, 2023). Figure 5 serves as an illustrative co-citation map, showcasing references that have been cited at least twenty times in the reviewed articles. Notably, within the realm of Agricultural Commodity Futures (ACF) research, certain scholars, including Irwin S.H, Gracia P, Leuthold R.M, Brorsen B.W, and Tse Y (depicted by green nodes), stand out for their extensively cited works. They have made significant contributions to a specific niche within the ACF domain. Similarly, another group of scholars, including Bollerslev T, Andersen T.G, Diebold F.X, Hansen P.R, Lunde A, and Chen I (represented by blue nodes), are prominent for their extensively cited works within a different segment of ACF research, contributing substantially to their area of expertise. Furthermore, in the field of ACF research, the contributions of scholars such as Nazlioglu S, Ji Q, Hammoudeh S, Soytaş U, Nguyen D.K, McAleer M, Kang S.H, Luo J, and Bouri E (depicted by red nodes) are noteworthy, as their work has been extensively cited in a specific ACF subdomain. In a similar vein, scholars like Engle R.F, Yang J, Granger C.W.J, Johansen S, and Dickey D.A (represented by yellow nodes) have garnered substantial recognition for their works, which have been heavily cited within a particular segment of ACF research. Their contributions have significantly impacted and enriched this academic field.

Thematic and influence structure analysis through bibliographic coupling

Table 6 Thematic and influence structure analysis through bibliographic coupling

Theme	Authors	Title	TC
Commodity Futures and Market Efficiency	Sensoy A et al. (2015)	"Dynamic convergence of commodity futures: Not all types of commodities are alike"	54
	McKenzie A.M and Holt M.T	"Market efficiency in agricultural futures markets"	93
	Coronado Ramírez S et al. (2015)	"Adaptive market efficiency of agricultural commodity futures contracts"	60
Futures Market and Price Discovery	Wang H.H and Ke B. (2005)	"Efficiency tests of agricultural commodity futures markets in China"	71
	Ali J and Gupta K.B. (2011)	"Efficiency in agricultural commodity futures markets in India: Evidence from cointegration and causality tests"	48
	Yang J et al. (2021)	"Price discovery in chinese agricultural futures markets: A comprehensive look"	23
Agricultural Commodities and Hedging	Xiong T et al. (2015)	"A combination method for interval forecasting of agricultural commodity futures prices"	84
	Garcia P and Leuthold R.M. (2004)	"A selected review of agricultural commodity futures and options markets"	70
	Yang J and Awokuse T.O. (2003)	"Asset storability and hedging effectiveness in commodity futures markets"	27
Agricultural Commodity Futures and Realized Volatility	Kang S.H et al. (2017)	"Dynamic spillover effects among crude oil, precious metal, and agricultural commodity futures markets"	318
	Sørensen C. (2002)	"Modeling Seasonality in Agricultural Commodity Futures"	129
	Tian F et al. (2017)	"Realized volatility forecasting of agricultural commodity futures using the HAR model with time-varying sparsity"	61

Source: Developed by the authors based on Scopus Database

Note(s): "TC= Total Citation"

Table 6 presents the theme clusters of ACF research identified through bibliographic coupling. The following four topic groupings emerged: Commodity Futures and Market Efficiency, Futures Market and Price Discovery, Agricultural Commodities and Hedging, Agricultural Commodity Futures and Realized Volatility. Additionally, the table includes the most influential articles within each cluster. These four groups comprehensively cover various aspects of ACF research, encompassing a wide range of topics in the field.

In Cluster 1, our research delves into the realm of commodity futures and market efficiency. Notable studies in this cluster include (Sensoy et al., 2015). which identified a convergence in returns for precious and industrial metal commodity futures around the mid-2000s. However, this convergence was not observed in agricultural commodity futures, indicating that the physical supply and demand balance, rather than global financial conditions, primarily influenced commodity futures prices. Another study by (McKenzie & Holt, 2002) examined market efficiency and unbiasedness in four agricultural commodity futures markets. They found that while futures prices accurately reflected expected future spot prices over the long run, short-run inefficiencies and pricing biases presented potential trading opportunities for those who could exploit these deviations. Furthermore, (Coronado Ramírez et al., 2015) investigated adaptive market efficiency in agricultural commodity futures markets and discovered evidence of nonlinear serial dependence in the returns series of selected agricultural commodity futures contracts.

Cluster 2 focuses on futures markets and price discovery. (Wang & Ke, 2005) analyzed the efficiency of Chinese futures markets for wheat and soybeans, revealing a long-term equilibrium relationship between soybean futures and cash prices but weak short-term efficiency. For wheat, the futures market was considered inefficient, possibly due to overspeculation and government intervention. These findings have significant implications for market participants, policymakers, and analysts in understanding and addressing issues in these commodity futures markets. Additionally, research by (Ali & Bardhan Gupta, 2011) highlighted the existence of cointegration between futures and spot prices for various agricultural commodities in India, shedding light on the effectiveness of futures markets for price discovery and risk management amidst evolving market dynamics and policy reforms. (Yang et al., 2021) acknowledged time and regional variations in the price discovery process and suggested that as agricultural futures markets in China mature, their influence on determining commodity prices increases.

In Cluster 3, publications revolve around agricultural commodities and hedging. (Xiong et al, 2015) introduced a modeling framework that combined linear and nonlinear elements to forecast interval-valued agricultural commodity futures prices. This approach, integrating Vector Error Correction Models (VECM) and Multi-Output Support Vector Regression (MSVR), performed well in providing interval forecasts. (Garcia & Leuthold, 2004) conducted a literature review on commodity futures and option markets, emphasizing major concerns such as price hedging, price discovery, hedging effectiveness, changing volatility, and institutional

issues. Meanwhile, (Yang & Awokuse, 2003) discussed hedging effectiveness in storable and nonstorable agricultural commodity futures markets, emphasizing the importance of considering the commodity's nature when developing hedging strategies.

Cluster 4 is dedicated to agricultural commodities futures and realized volatility. (Kang et al., 2017) explored spillover effects among six commodity futures markets, including gold, silver, West Texas Intermediate crude oil, corn, wheat, and rice. Employing the multivariate DECO-GARCH model and the spillover index, the study analyzed how returns and volatilities interconnected, particularly during global financial and European sovereign debt crises. The study also assessed optimal portfolio weights and time-varying hedge ratios. (Sørensen, 2002) examined the stochastic behavior of agricultural commodity prices, considering factors like seasonality, supply and demand dynamics, and inventory levels' influence on pricing. The Kalman filter for parameter estimation and the theory of storage were used to gain insights into the stochastic behavior of these commodity markets. Lastly, (Tian et al., 2017) introduced a novel approach to forecasting realized volatility in Chinese agricultural commodity futures markets, utilizing a time-varying HAR model and an independent normal-gamma autoregressive process for the regression coefficients. Their results indicated that this approach improved forecast accuracy significantly compared to simpler models.

Thematic trends of ACF research

Expanding upon the foundational principles and themes delineated by co-citation analysis and bibliographic coupling, this study investigates thematic patterns within the realm of Agricultural Commodity Futures (ACF) through the lens of co-occurrence analysis. Specifically, we employ authors' keywords to conduct this co-occurrence analysis. These keywords undergo a chronological filter to discern the evolutionary trajectory of key ACF issues prominently featured in no fewer than three articles within our comprehensive review corpus. The visual representation of this thematic evolution is elucidated in Figures 6 - 9.

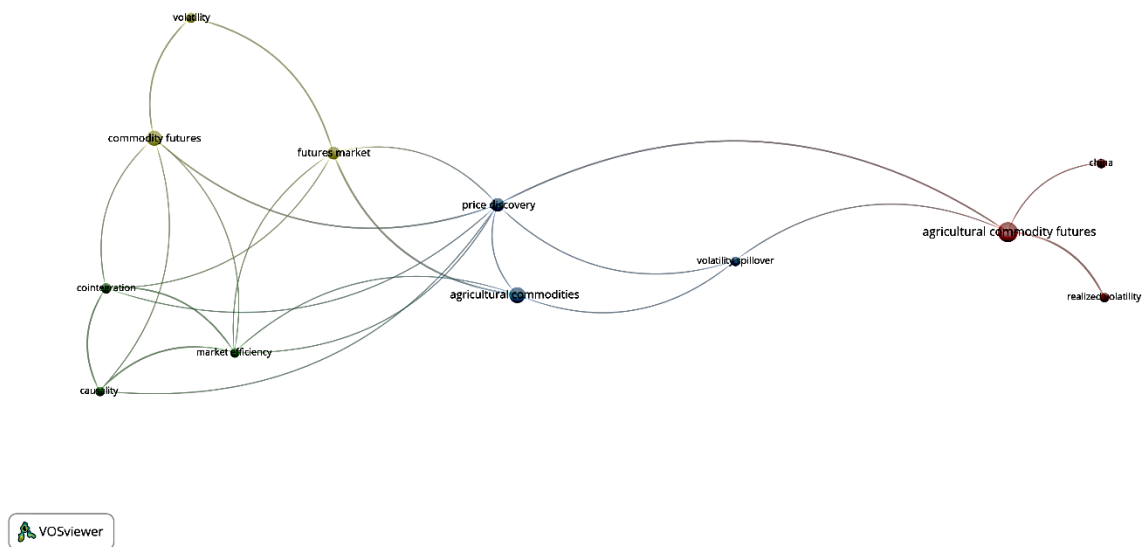


Figure 6. Influential topics in the “period of 1992 - 1999”

Source: Developed by the authors based on Scopus Database on R and VOS Viewer

Note(s): “Red Nodes = agricultural commodity futures, and realized volatility. Green Nodes = cointegration, market efficiency and causality. Blue Nodes = price discovery, volatility spillover and agricultural commodities. Yellow nodes = commodity futures, futures market and volatility.”

The analysis of ACF research themes from 1992 to 1999 uncovers discernible areas of focus. This epoch witnessed a primary concentration on agricultural commodity futures and realized volatility, denoted by the red nodes. Concurrently, it accentuates the significance of cointegration, market efficiency, and causality, represented by the green nodes, in addition to the attention given to price discovery, volatility spillover, and

agricultural commodities, signified by the blue nodes. This time frame marks the nascent phase of Agricultural Commodity Futures, marked by its inception characterized by a burgeoning interest in price discovery and volatility spillover.

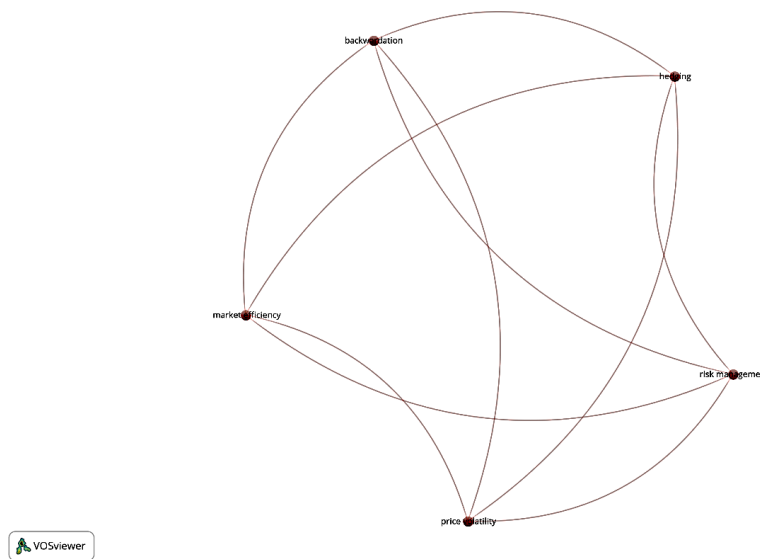


Figure 7. Influential topics in the “period of 2000 - 2007”

Source: Developed by the authors based on Scopus Database on R and VOS Viewer

Note(s): “Red Nodes = market efficiency, price volatility, risk management, backwardation and hedging.”

The research spanning the years 2000 to 2007 within the domain of Agricultural Commodity Futures underscores the prevalence of specific themes in the field. Over this duration, the investigation primarily centers around market efficiency, price volatility, risk management, backwardation, and hedging, as signified by the red nodes. It is worth noting that the period from 2003 to 2007 exhibits a relative dearth of research activity in the realm of agricultural commodity futures, as evidenced by a solitary node in Figure 2.

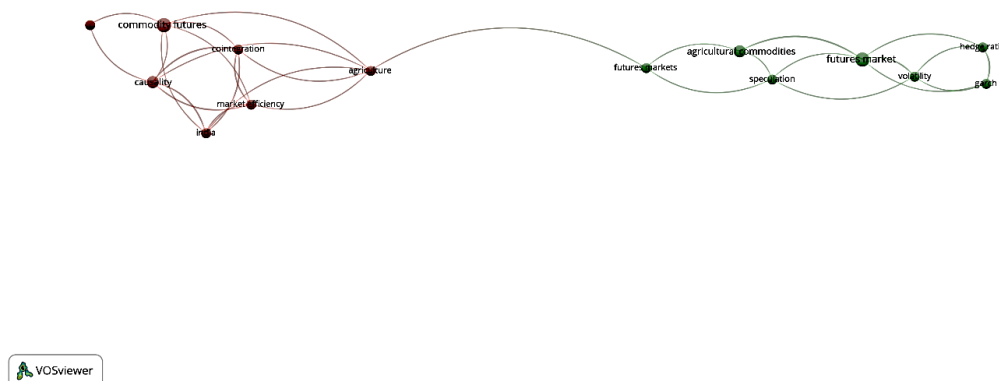


Figure 8. Influential topics in the “period of 2008 - 2015”

Source: Developed by the authors based on Scopus Database on R and VOS Viewer

Note(s): “Red Nodes = commodity futures, cointegration, market efficiency, causality, agricultural. Green Nodes = futures market, agricultural commodities, speculation, volatility, garch, hedge ratio.”

The examination conducted within the domain of Agricultural Commodity Futures research between 2008 and 2015 reveals noteworthy thematic concentrations. This research predominantly gravitates towards subjects encompassing commodity futures, cointegration, market efficiency, causality, and agriculture, as indicated by the red nodes. Furthermore, it underscores the importance of futures markets, agricultural commodities, speculation, volatility, GARCH, and hedge ratio, represented by the green nodes. These observations imply that during this specific period, Agricultural Commodity Futures research experienced significant expansion, notably in relation to commodity futures, and evolved into a more comprehensive thematic landscape for further exploration.

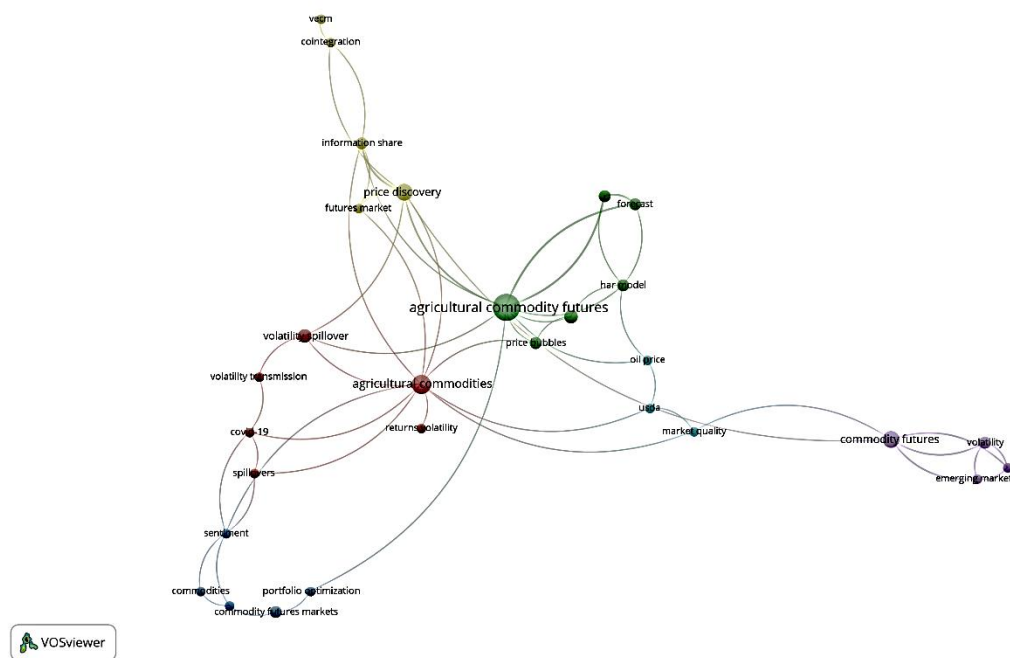


Figure 9. Influential topics in the “period of 2016 - 2023”

Source: Developed by the authors based on Scopus Database on R and VOS Viewer

Note(s): “Blue Nodes = commodity futures market, portfolio optimization, and commodities. Red Nodes = agricultural commodities, volatility spillover, volatility transmission, returns volatility, and spillovers. Green Nodes = agricultural commodity, futures, price bubbles, har model, and forecast. Yellow Nodes = price discovery, information share, futures market, cointegration and VECM. Sky Blue Nodes = oil price, market quality. Purple Nodes = commodity futures, emerging markets, and volatility.”

The research conducted in the field of Agricultural Commodity Futures between 2016 and 2023 reveals distinct thematic concentrations. This investigation primarily centers on themes such as agricultural commodities, volatility spillover, volatility transmission, returns volatility, and spillovers, denoted by the red nodes. Additionally, the study encompasses areas such as the commodity futures market, portfolio optimization, and commodities, as indicated by the Blue Nodes. Moreover, the research delves into topics including agricultural commodities, futures, price bubbles, HAR model, and forecasting, represented by the green nodes. Furthermore, the study explores the themes of price discovery, information sharing, futures market, cointegration, and VECM, highlighted by the yellow nodes. It also examines the theme of commodity futures in emerging markets and volatility, denoted by the purple nodes, as well as oil prices and market quality, signified by the sky-blue nodes.

Future Research Directions

It is imperative to assess Agricultural Commodity Futures (ACF) studies within a historical context as it plays a pivotal role in understanding the current and future implications. By thoroughly examining relevant literature, this research aims to establish a fundamental framework for the rapidly expanding field of ACF research.

A prospective study could explore how the latest advancements drive ACF to achieve superior performance. From 1992 to 1999 (see figure 6), the focus of Agricultural Commodity Futures research was primarily on agricultural commodity futures, and realized volatility, volatility spillover and agricultural commodities, commodity futures, futures market and volatility. During the period spanning from 2000 to 2007 (see figure 7), the research shifted towards topics like market efficiency, price volatility, risk management, backwardation and hedging. The subsequent phase, spanning from 2008 to 2015 (see figure 8), saw a concentration on commodity futures, cointegration, market efficiency, causality, speculation, garch, hedge ratio. As we move into more recent years, from 2016 onwards (see figure 9), the focal points in commodity futures market, portfolio optimization, commodities, price bubbles, har model, forecast, information share, oil price, market quality, emerging markets, volatility and VECM.

This research agenda encompasses a diverse range of critical issues pertaining to agricultural commodities futures markets, acknowledging the dynamic nature of this field. It delineates several key research directions that can provide valuable insights into the complexities and challenges faced by the industry. First and foremost, the impact of climate change on agricultural commodities futures prices, particularly in light of the increasing frequency of extreme weather events, merits in-depth investigation. This research seeks to assess the correlation between climate-related factors, such as droughts and temperature fluctuations, and price volatility in futures markets, with a keen focus on understanding how these changes affect stakeholders within the agricultural commodities industry.

Another crucial area of exploration centers on the indispensable role played by agricultural commodities futures markets in ensuring global food security. Researchers are encouraged to evaluate the accessibility and effectiveness of these markets, especially in developing countries, and to propose strategies for enhancing their contribution to food security, risk management, and agricultural sustainability. Furthermore, this research agenda delves into the transformative influence of emerging technologies, such as artificial intelligence and blockchain, on agricultural commodities futures markets. The inquiry seeks to investigate how these technologies can be harnessed to enhance market efficiency, transparency, and risk management, ultimately benefiting market participants and society at large. The implications of government policies, including subsidies and tariffs, on agricultural commodities prices and futures markets constitute yet another area of significant scrutiny. Researchers are encouraged to explore how these policies can be restructured to promote market efficiency, reduce price volatility, and ensure fair and sustainable market conditions.

In addition, researchers are invited to assess the adequacy of existing futures contracts and explore the development of new contract types tailored to the evolving needs of market participants. This examination aims to investigate how innovative contracts can provide improved risk management tools for farmers, producers, and investors. The research agenda also places a spotlight on understanding the precise impact of specific weather events, such as hurricanes, droughts, and floods, on agricultural commodities futures prices. This includes the development of predictive models to better comprehend the relationship between these events and price fluctuations, thereby aiding risk management strategies. Hedging strategies available to agricultural producers within commodities futures markets come under scrutiny, with an emphasis on evaluating their suitability in managing price risk, considering market dynamics and emerging challenges.

Furthermore, researchers are prompted to explore the interconnectedness of agricultural commodities futures prices with other financial markets, such as equity and currency markets. This exploration seeks to identify how factors in one market influence prices and trading behavior in the other, potentially uncovering arbitrage opportunities and risk management implications. Government interventions in the form of export bans and market stabilization efforts are also subject to analysis. Researchers will investigate the effectiveness of such interventions and their consequences for market participants. Finally, the integration of advanced technologies to optimize the efficiency and performance of agricultural commodities futures markets is explored. This includes the implementation of algorithms, high-frequency trading, and data analytics to improve trading strategies, price discovery, and risk assessment.

These research directions offer a comprehensive roadmap for studying agricultural commodities futures markets, allowing researchers to focus on specific aspects and contribute to a deeper understanding of this multifaceted field, while addressing the critical challenges that underpin it. It is noteworthy to analyse the primary contributors to this domain, such as the China, USA and India, to understand the factors driving their

substantial contributions. Conversely, it is equally imperative to examine the reasons behind the limited or lagging contributions from countries like Austria, Belgium, Greece, Mexico, Netherlands, Serbia, Spain, Denmark, New Zealand, Pakistan, Portugal, Saudi Arabia, and others in the Agricultural Commodity Futures research.

Conclusion

Our exploration of bibliometric analysis has yielded valuable insights into the landscape of Agricultural Commodity Futures (ACF) research. By utilizing the extensive Scopus database, we have examined publication and research trends, identified influential elements, and traced the thematic evolution within the ACF domain over various periods. This research significantly advances our understanding of ACF development and provides a foundation for potential future research directions. Scholars can leverage this work to explore emerging areas in ACF, offering policymakers and practitioners deeper insights into the evolving nature of this dynamic field. This exploration can uncover new opportunities and challenges within ACF-related industries and businesses.

Notably, our analysis highlights China, United States, and India as major contributors to ACF research. Over the past eight years, ACF has become a prominent and widely-discussed subject. Our research focuses on identifying extensively studied ACF domains, thereby aiding researchers in pinpointing potential research gaps that merit attention in future studies. It is evident that “Agricultural Commodity Futures” has consistently been the most frequently used keyword in studies since 2015, with notable peaks in research output in 2015 and 2017, and a projected increase in studies for 2023.

However, future researchers should expand their focus to include other regions of the world, especially in developing countries, to explore the ACF research which lead to a more comprehensive understanding of the global ACF landscape, enriching the field's knowledge with diverse and inclusive insights.

Limitations of the study

As researchers, we recognize and acknowledge the limitations inherent to this study, primarily centered on the utilization of a bibliometric approach exclusively with the Scopus database. To advance the comprehensiveness and depth of our understanding of the research landscape within the field, it is imperative for future investigations to contemplate the incorporation of data from alternative, reputable sources, such as the Web of Science. Additionally, an amalgamation of bibliographic data from both Scopus and Web of Science databases could be considered, ensuring the inclusion of high-quality publications that may be exclusive to one database or the other. Furthermore, the scope of future research endeavours could be expanded by adopting a more specialized focus, possibly concentrating solely on high-impact publications indexed in esteemed ranking systems such as SSCI, ABDC, ABS, or FT 50. This refined approach would provide invaluable insights into the research paradigm within the Agriculture Commodities Futures (ACF) domain as viewed through the lens of top-tier publications.

Implications of the study

This study provides a valuable resource for stakeholders in the Agriculture Commodities Futures (ACF) field. It offers an overview of existing research, highlighting key contributors and the current state of the domain. This information aids marketers, entrepreneurs, academics, and scholars in addressing industry challenges and enhancing problem-solving capabilities. Additionally, the study identifies research gaps and guides future directions, benefiting researchers seeking to advance ACF knowledge. For scholars aiming to publish in reputable journals, it helps align their work with established themes and trends, increasing acceptance chances and wider dissemination.

Acknowledgement

This study was funded by the Rashtriya Uchchatar Shiksha Abhiyan, Alagappa University – Theme Based Research Project 2024 (RUSA ALU – TBRP 2024). The authors gratefully acknowledge the financial support of this initiative. Jenefer J and Anand Bharathi S extends sincere thanks for the support provided through the Doctoral Fellowship, which has played a pivotal role in the development of this article

References:

- Ababouch, L., Nguyen, K.A.T., Castro de Souza, M. and Fernandez-Polanco, J. (2023)** 'Value chains and market access for aquaculture products', *Journal of the World Aquaculture Society*, 54(3), pp. 601-617.
- Aggarwal, N., Jain, S. and Thomas, S. (2014)** 'Do futures markets help in price discovery and risk management for commodities in India?', *Journal of Futures Markets*, 34(1), pp. 1-15.
- Ali, J. and Bardhan Gupta, K. (2011)** 'Efficiency in agricultural commodity futures markets in India: Evidence from cointegration and causality tests', *Agricultural Finance Review*, 71(2), pp. 162-178.
- Allioui, H. and Mourdi, Y. (2023)** 'Exploring the full potentials of IoT for better financial growth and stability: A comprehensive survey', *Sensors*, 23(19), p. 8015.
- Balleisen, E.J. and Brake, E.K. (2014)** 'Historical perspective and better regulatory governance: An agenda for institutional reform', *Regulation & Governance*, 8(2), pp. 222-245.
- Bargawi, H.K. and Newman, S.A. (2017)** 'From futures markets to the farm gate: A study of price formation along Tanzania's coffee commodity chain', *Economic Geography*, 93(2), pp. 162-184.
- Basu, R. (2023)** *Managing Global Supply Chains: Contemporary Global Challenges in Supply Chain Management*. Taylor & Francis.
- Borch, K. (2007)** 'Emerging technologies in favour of sustainable agriculture', *Futures*, 39(9), pp. 1045-1066.
- Borin, A. and Di Nino, V. (2012)** 'The role of financial investments in agricultural commodity derivatives markets', *Bank of Italy Temi di Discussione (Working Paper) No. 849*.
- Buttel, F.H. (2013)** 'Some observations on agro-food change and the future of agricultural sustainability movements', in *Globalising Food*. Routledge, pp. 253-268.
- Campbell, B.M., Vermeulen, S.J., Aggarwal, P.K., Corner-Dolloff, C., Girvetz, E., Loboguerrero, A.M., ... and Wollenberg, E. (2016)** 'Reducing risks to food security from climate change', *Global Food Security*, 11, pp. 34-43.
- Chui, M. (2012)** 'Derivatives markets, products and participants: an overview', *IFC Bulletin*, 35, pp. 3-12.
- Clapp, J. and Helleiner, E. (2012)** 'Troubled futures? The global food crisis and the politics of agricultural derivatives regulation', *Review of International Political Economy*, 19(2), pp. 181-207.
- Coronado Ramírez, S., Celso Arellano, P.L. and Rojas, O. (2015)** 'Adaptive market efficiency of agricultural commodity futures contracts', *Contaduría y Administración*, 60(2), pp. 389-401.
- Donthu, N., Kumar, S., Mukherjee, D., Pandey, N. and Lim, W.M. (2021)** 'How to conduct a bibliometric analysis: An overview and guidelines', *Journal of Business Research*, 133, pp. 285-296.
- Fairbairn, A.S. (2020)** 'Agriculture in the Chalcolithic and Bronze Age of Asia Minor', in Erdkamp, P., Hollander, D. and Ruffing, K. (eds.) *A Companion to Ancient Agriculture*. Wiley-Blackwell, pp. 211-239.
- Farooq, M.S., Uzair, M., Raza, A., Habib, M., Xu, Y., Yousuf, M. ... and Ramzan Khan, M. (2022)** 'Uncovering the research gaps to alleviate the negative impacts of climate change on food security: A review', *Frontiers in Plant Science*, 13, p. 927535.
- Farrell, H. and Newman, A.L. (2010)** 'Making global markets: Historical institutionalism in international political economy', *Review of International Political Economy*, 17(4), pp. 609-638.
- Fleming, A. and Vanclay, F. (2010)** 'Farmer responses to climate change and sustainable agriculture: A review', *Agronomy for Sustainable Development*, 30, pp. 11-19.
- Frank, D. (1992)** 'Agricultural commodity futures markets in South Africa', *Agrekon*, 31(4), pp. 313-320.
- Garcia, P. and Leuthold, R.M. (2004)** 'A selected review of agricultural commodity futures and options markets', *European Review of Agricultural Economics*, 31(3), pp. 235-272.
- Ghosh, J., Heintz, J. and Pollin, R. (2012)** 'Speculation on commodities futures markets and destabilization of global food prices: Exploring the connections', *International Journal of Health Services*, 42(3), pp. 465-483.

- Goel, R.K. and Kaur, H. (2021)** 'Commodity futures research: A bibliometric analysis', *Mudra: Journal of Finance and Accounting*, 8(1), pp. 100-119.
- Held, D., McGrew, A., Goldblatt, D. and Perraton, J. (1999)** 'Global transformations: Politics, economics and culture', in Hayward, J. and Barry, B. (eds.) *Politics at the Edge: The PSA Yearbook 1999*. London: Palgrave Macmillan UK, pp. 14-28.
- Hidalgo, F., Quiñones-Ruiz, X.F., Birkenberg, A., Daum, T., Bosch, C., Hirsch, P. and Birner, R. (2023)** 'Digitalization, sustainability, and coffee: Opportunities and challenges for agricultural development', *Agricultural Systems*, 208, p. 103660.
- Inani, S.K. (2018)** 'Price discovery and efficiency of Indian agricultural commodity futures market: An empirical investigation', *Journal of Quantitative Economics*, 16(1), pp. 129-154.
- Isakson, S.R. (2017)** 'Food and finance: The financial transformation of agro-food supply chains', in Akram-Lodhi, H. and Kay, C. (eds.) *New Directions in Agrarian Political Economy*. Routledge, pp. 109-136.
- Kalogeras, N., Odekerken-Schröder, G., Pennings, J.M.E., Gunnlaugsdóttir, H., Holm, F., Leino, O. ... and Verhagen, H. (2012)** 'State of the art in benefit-risk analysis: Economics and Marketing-Finance', *Food and Chemical Toxicology*, 50(1), pp. 56-66.
- Kang, S.H., McIver, R. and Yoon, S.M. (2017)** 'Dynamic spillover effects among crude oil, precious metal, and agricultural commodity futures markets', *Energy Economics*, 62, pp. 19-32.
- Knickel, K., Ashkenazy, A., Chebach, T.C. and Parrot, N. (2017)** 'Agricultural modernization and sustainable agriculture: Contradictions and complementarities', *International Journal of Agricultural Sustainability*, 15(5), pp. 575-592.
- Konstantinidis, A., Katarachia, A., Borovas, G. and Voutsas, M.E. (2012)** 'From efficient market hypothesis to behavioural finance: Can behavioural finance be the new dominant model for investing?', *Scientific Bulletin – Economic Sciences*, 11(2), pp. 16-26.
- Li, J., Li, G., Liu, M., Zhu, X. and Wei, L. (2022)** 'A novel text-based framework for forecasting agricultural futures using massive online news headlines', *International Journal of Forecasting*, 38(1), pp. 35-50.
- Liverman, D. and Kapadia, K. (2012)** 'Food Security, Food Systems and Global Environmental Change', in Ingram, J., Ericksen, P. and Liverman, D. (eds.) *Food Security and Global Environmental Change*. Routledge, pp. 3-24.
- Lo, A.W. (2021)** 'The Financial System Red in Tooth and Claw: 75 Years of Co-Evolving Markets and Technology', *Financial Analysts Journal*, 77(3), pp. 5-33.
- Lund, S., Manyika, J., Woetzel, J., Barriball, E. and Krishnan, M. (2020)** *Risk, resilience, and rebalancing in global value chains*. McKinsey Global Institute.
- Luo, J. and Ji, Q. (2018)** 'High-frequency volatility connectedness between the US crude oil market and China's agricultural commodity markets', *Energy Economics*, 76, pp. 424-438.
- Mattos, F. and Garcia, P. (2004)** 'Price discovery in thinly traded markets: Cash and futures relationships in Brazilian agricultural futures markets', *Proceedings of the NCCC-134 Conference on Applied Commodity Price Analysis, Forecasting, and Market Risk Management*, St. Louis, MO.
- McKenzie, A.M. and Holt, M.T. (2002)** 'Market efficiency in agricultural futures markets', *Applied Economics*, 34(12), pp. 1519-1532.
- Mueller, L., Eulenstein, F., Dronin, N.M., Mirschel, W., McKenzie, B.M., Antrop, M. ... and Poulton, P. (2021)** 'Agricultural landscapes: History, status and challenges', in Mueller, L. (ed.) *Exploring and Optimizing Agricultural Landscapes*, Springer, pp. 3-54.
- Nandan, T. and Soni, R.K. (2023)** 'Bibliometric analysis: A comparative overview of the literature on commodity market for the period 2006-2021', *International Journal of Electronic Finance*, 12(3), pp. 263-294.
- Noe, E. and Alrøe, H.F. (2015)** 'Sustainable agriculture issues explained by differentiation and structural coupling using social systems analysis', *Agronomy for Sustainable Development*, 35, pp. 133-144.

- Petry, J., Koddenbrock, K. and Nölke, A. (2023)** 'State capitalism and capital markets: Comparing securities exchanges in emerging markets', *Environment and Planning A: Economy and Space*, 55(1), pp. 143-164.
- Pinzur, D.L. (2016)** *Building futures markets: Infrastructure and outcome on the Chicago Board of Trade and New Orleans Cotton Exchange, 1856–1916*. University of California, San Diego.
- Pollock, S. (1992)** 'Bureaucrats and managers, peasants and pastoralists, imperialists and traders: Research on the Uruk and Jemdet Nasr periods in Mesopotamia', *Journal of World Prehistory*, 6, pp. 297-336.
- Rao, V. (2015)** *Developing the financial sector and expanding market instruments to support a Post-2015 Development Agenda in Asia and the Pacific*. Available at: <https://www.unescap.org/publications> (Accessed: 4 October 2024).
- Rejeb, A., Keogh, J.G., Zailani, S., Treiblmaier, H. and Rejeb, K. (2020)** 'Blockchain technology in the food industry: A review of potentials, challenges and future research directions', *Logistics*, 4(4), p. 27.
- RL, M. and Mishra, A.K. (2020)** 'Price discovery and volatility spillover: An empirical evidence from spot and futures agricultural commodity markets in India', *Journal of Agribusiness in Developing and Emerging Economies*, 10(4), pp. 447-473.
- Saleuddin, R. (2017)** *The United States Federal Government and the Making of Modern Futures Markets, 1920-1936*. Doctoral dissertation, University of Cambridge.
- Sensoy, A., Hacıhasanoglu, E. and Nguyen, D.K. (2015)** 'Dynamic convergence of commodity futures: Not all types of commodities are alike', *Resources Policy*, 44, pp. 150-160.
- Sørensen, C. (2002)** 'Modeling seasonality in agricultural commodity futures', *Journal of Futures Markets: Futures, Options, and Other Derivative Products*, 22(5), pp. 393-426.
- Tian, F., Yang, K. and Chen, L. (2017)** 'Realized volatility forecasting of agricultural commodity futures using the HAR model with time-varying sparsity', *International Journal of Forecasting*, 33(1), pp. 132-152.
- Ullah, R., Shivakoti, G.P., Zulfiqar, F. and Kamran, M.A. (2016)** 'Farm risks and uncertainties: Sources, impacts and management', *Outlook on Agriculture*, 45(3), pp. 199-205.
- Wang, H.H. and Ke, B. (2005)** 'Efficiency tests of agricultural commodity futures markets in China', *Australian Journal of Agricultural and Resource Economics*, 49(2), pp. 125-141.
- Weber, B.W. (1999)** 'Screen-based trading in futures markets: recent developments and research propositions', in *Proceedings of the 32nd Annual Hawaii International Conference on Systems Sciences*. IEEE, pp. 10-pp.
- Will, M.G., Prehn, S., Pies, I. and Glauben, T. (2015)** 'Is financial speculation with agricultural commodities harmful or helpful?: A literature review of empirical research', *The Journal of Alternative Investments*, 18(3), pp. 84-102.
- Williams, J.W. (2013)** 'Regulatory technologies, risky subjects, and financial boundaries: Governing "fraud" in the financial markets', *Accounting, Organizations and Society*, 38(6-7), pp. 544-558.
- Xiong, T., Li, C., Bao, Y., Hu, Z. and Zhang, L. (2015)** 'A combination method for interval forecasting of agricultural commodity futures prices', *Knowledge-Based Systems*, 77, pp. 92-102.
- Yang, J. and Awokuse, T.O. (2003)** 'Asset storability and hedging effectiveness in commodity futures markets', *Applied Economics Letters*, 10(8), pp. 487-491.
- Yang, J., Li, Z. and Wang, T. (2021)** 'Price discovery in Chinese agricultural futures markets: A comprehensive look', *Journal of Futures Markets*, 41(4), pp. 536-555.
- Zhang, Q., Hu, Y., Jiao, J. and Wang, S. (2022)** 'Exploring the trend of commodity prices: A review and bibliometric analysis', *Sustainability*, 14(15), p. 9536.

An Impact of Service Quality Determinants on Passenger Satisfaction in Konkan Railway: The Moderating Role of Gender and Mediating Effect of Platform Services

Mr. Neelesh Shashikant Morajkar
Commerce Department, Sateri Pissani
Education Society's, Shri Gopal Goankar
Memorial, Goa Multi-Faculty College,
Dharbandora – Goa, India.

Prof. (CA) Subrahmanya Bhat K.M
Commerce Department, Vidhya Vikas
Mandal's Shree Damodar College of
Commerce & Economics, Margao -Goa,
India.

Abstract

Indian Railways connect a wide region of the part of the country where Konkan Railway is an engineering marvel to connect it to Indian Railways. The Konkan Railway, renowned for its engineering excellence, links Roha to Thokur, enabling both passenger and freight transport by significantly enhancing the region's socio-economic development. The study investigates the impact of off-board service quality factors on passenger satisfaction within the Konkan Railway. The study utilises Structural Equation Modelling (SEM) and Mediation Analysis to examine the correlations between these services and passenger satisfaction. A preliminary step, Measurement Invariance of Composite Models (MICOM), is employed to investigate the influence of gender in moderating these relationships with platform services acting as a mediating variable. The research indicates that every off-board service quality factor positively influences passenger satisfaction. Platform services were recognised as crucial mediating factors, connecting various off-board service quality components to overall passenger satisfaction. The MICOM analysis validated the model's robustness and highlighted the significance of the moderator. When examined as a moderating variable, gender revealed no significant disparities in the ratings of off-board service quality between male and female passengers. This indicates that both genders have similar perceptions of the services and enhancements in these areas that equally benefits all passengers. Consequently, gender does not significantly influence passengers' satisfaction with off-board services on the Konkan Railway, facilitating cohesive service improvement initiatives across demographic segments. This study concludes that counter service, waiting room facilities, public announcements, platform services and staff behaviour improve Konkan Railway passenger satisfaction. Platform services mediate and amplify other service quality factors. Although gender doesn't moderate these relationships, the study emphasises platform services as a key passenger satisfaction factor. The Konkan Railway can strengthen its position as a vital link in India's rail network by focusing on these improvements, making passenger travel more pleasant and convenient.

Keywords: Mediation, Moderation, Passenger Satisfaction, Railway Amenities

Introduction

Indian Railways (IR) is one of the world's broadest and vital railway networks, encompassing a large portion of the Indian subcontinent. The public transportation systems are the most efficient means of transportation for passengers and carriages connecting rural areas to dense urban areas, and to satisfy the passengers, high levels of quality services are required on-board and off-board, which helps the passengers or the users of the services to meet their satisfaction and attract the new users (S. Gandhimathi*, 2013). Providing basic amenities off-board and on-board is essential for passengers' satisfaction (Vanniarajan and Stephen, 2008). The Konkan Railway (KR) project was initiated in 1990. It was flagged off on January 26, 1998, Republic Day, connecting a link between the long-isolated west coast region between Mumbai to Mangalore, i.e., the Konkan region, with the rest of the railway network to the country railway network (Shanbhag, Walia and Borges, 2001). Konkan Railway improved connectivity for the passengers and gave more support to the freight volume, but to improve the revenue, the management has to give passenger satisfaction importance by improving facilities which are provided at the off-the-train and on-the-train (Jaiswal *et al.*, 2022).

Literature Review:

The review provides a vast understanding of factors influencing passenger satisfaction across numerous aspects of public transportation systems, including counter services, waiting room facilities, public announcements, platform services, and staff behaviour. (Cao *et al.*, 2016; Verbich and Ahmed, 2016) highlight the significance of service attributes like ease of use, travel cost, safety and many more in enhancing overall satisfaction with transport services while (R.Karthikeyan, U. Geetha, 2015) signifies the security and the waiting room environment in railway transit. (Sarin, 2011; Dr. Shilpi, 2018) highlighted the importance of basic amenities, cleanliness, and comfort in railways, while (Bhattarai, 2019) focused on the role of staff behaviour and

accessibility in determining satisfaction to the passenger. (Anna, Antonello and Paletta, 2014) emphasise the importance of passenger feedback and quality assessment in improving public transport productivity and quality, while (Ghosh, Ojha and Geetika, 2017) explained the need to improve cleanliness and hygiene-related amenities at the railway platform. Additionally, (S. Gandhimathi, 2014) identifies optimistic perceptions regarding punctuality and speed but is dissatisfied with the availability of convenience facilities like drinking water, waiting room services and refreshments at the station.

Research on service quality in public transportation consistently highlights its significant impact on passenger satisfaction with elements such as reliability, comfort, safety and responsiveness influencing user perceptions (Mat *et al.*, 2019). Research indicates that the quality of platform services such as cleanliness, accessibility and signage, significantly influences passenger satisfaction with railway services (Erlangga, Widodo and Siahaan, 2021). The public transport system indicates that enhancements in service quality, particularly regarding platform facilities, are essential for satisfying passenger expectations and promoting a favourable travel experience (Maxwell Sandada, 2015). Furthermore, to the primary and mediating hypotheses, the researchers suggested that gender significantly influences the relationship between service quality attributes and passenger satisfaction. The service sector acknowledged gender as a crucial determinant of profitability and customer satisfaction (Gopal Vasanthi *et al.*, 2023a). Certain researchers investigated that women exhibited greater satisfaction with service quality than men (Kwok, Jusoh and Khalifah, 2016). According (Karatepe, 2011) to women and men exhibit distinct information processing methods. Notwithstanding the biological and physical disparities, women assess product quality and purchase differently than men. The influence of gender impacts the analysis of consumption and satisfaction via socialisation and self-regulation theories. Women integrated the information more effectively than men, who might overlook the service quality attributes (Darley and Smith, 1995). Empirical evidence indicates gender differences in service evaluation and customer satisfaction (Iacobucci and Ostrom, 1993). Together, these studies provide relevant insight into the multifaceted nature of passenger satisfaction, highlighting the importance of various service quality indicators and basic amenities in determining and enhancing the passenger experience and satisfaction in the public transportation system and suggesting areas for improvement to enhance overall satisfaction.

Importance of the Study:

It is pivotal in understanding the multifaceted factors influencing passenger satisfaction in the Konkan Railway. With the railways being a critical mode of transportation in this country, this study will provide valuable insights into how service quality determinants like waiting rooms, public announcements, counter services, etc, impact overall satisfaction. This inclusion of gender as a moderating variable offers a nuanced view of how different passenger segments perceive service quality (Karatepe, 2011; Gopal Vasanthi *et al.*, 2023b), while examining platform service as a mediating factor highlights the integral role these services play in enhancing the travel experience. By identifying key areas for improvement, this study contributes to academic knowledge and offers practical recommendations for railway authorities to enhance service quality and passenger satisfaction.

Statement of the Problem:

Despite the essential role of the railways in transportation, there remains a gap in understating the specific factors that influence passenger satisfaction within the Konkan Railway System. Previous studies like SERVQUAL and SERVPERF have often overlooked the detailed impact of individual service quality determinants and how they interact with demographic variables such as gender. Additionally, the role of platform service in mediating the relationship between service quality attributes and passenger satisfaction has not been thoroughly explored. This lack of comprehensive understanding hinders the development of targeted strategies to improve passenger experiences. Therefore, this study aims to address these gaps by systematically examining the impact of various off-board service quality determinants on passenger satisfaction, considering the moderating effect of gender and the mediating role of platform services.

Objectives of the Study:

The aims of the study are:

1. Evaluate the effect of off-board service factors on passenger satisfaction.
2. Examine how platform service affects passenger satisfaction.
3. Determine whether platform amenities affect passenger pleasure differently based on gender.

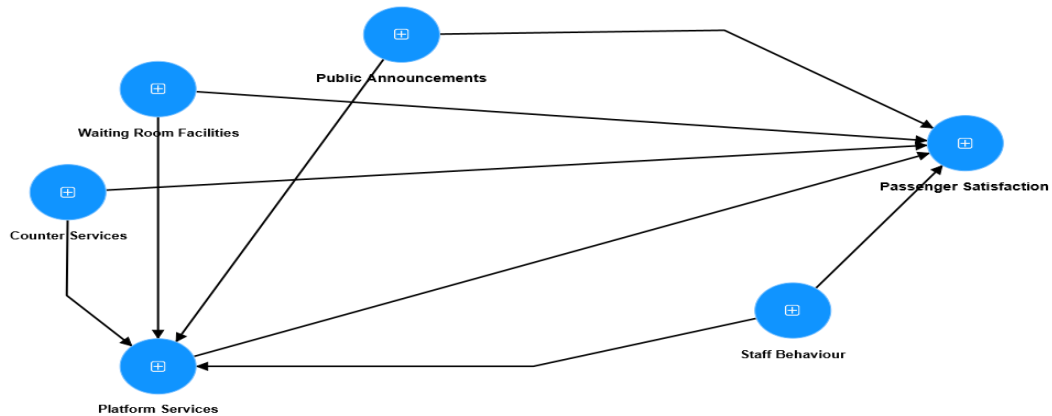


Fig. no.1 Conceptual Model

Hypotheses:

1. H1: There is no statistical relationship between off-board services and passenger satisfaction.
2. H2: There is no significant indirect relationship between off-board services and passenger satisfaction mediated by Platform services.
3. H3: Gender has no significant effect on the relationship between off-board service quality and passenger satisfaction.

Research Methodology:

Survey Design:

The scale used for the research evolved from many other identical studies in the field of public transportation, and the elements from these studies were modified to fit the cultural, economical, and social context of the Konkan Railway. The questionnaire was divided into two parts: the first contained nine items and collected demographic information from responses. Gender, age, marital status, educational qualification, occupation, annual income, place of residence, and reason for the trip were among the demographic variables assessed. A categorical scale was used to assess the above items. The following section was tailored for passenger satisfaction by taking independent variables such as counter services, waiting room amenities, public announcements, platform services, and station staff behaviour; a total of 31 items were examined, and overall passenger satisfaction was assessed using six items from the main study. These items were evaluated using a five-point Likert scale, from 1 (Highly Dissatisfied) to 5 (Highly Satisfied). A pilot test at Madgaon Konkan Railway Station included 200 randomly selected respondents who filled out a questionnaire to discover instrument shortcomings. As per the test results, questionnaire items were altered to increase clarity and uniformity. (Table 1) shows the outcome of the reliability analysis of the pilot test.

Table 1: Construct items and reliability analysis of the instrument.

Sr. No.	Construct	No. of items	Cronbach's Alpha
1	Counter Services	5	0.827
2	Waiting Room Facilities	5	0.837
3	Public Announcement	6	0.794
4	Platform Services	8	0.869
5	Staff Behaviour	7	0.892

Cronbach's Alpha assesses the internal consistency and is a valuable tool to evaluate the construct's reliability. Cronbach's Alpha values equal to or greater than 0.6 are believed to indicate adequate dependability. (Glenn L. Koonce, 2003; Bonett and Wright, 2015; Sharma, 2016; Daud, , Nik Zulkarnaen Khidzir and Abdullah, 2018; Simcox, 2018; Taber, 2018; Mat Nawi *et al.*, 2020; Juggessur, 2022)

Sample Size And Data Collection:

Indian Railway stations are classified into three types: Suburban Group (SG) Stations, Non-Suburban Group (NSG) Stations, and Halt Stations (HS), according to passenger earnings and outbound passengers managed at the station. The Suburban group station is further segregated into three categories i.e. SG1, SG2, and SG3, the Non-Suburban Group station has been segregated into Six categories, i.e. NSG1, NSG2, NSG3, NSG4, NSG5

and NSG6. Similarly, the Halt Station has been segregated into i.e. HG1, HG2 and HG3. The Madgaon Konkan Railway station falls under the NSG2, where the proposed earning of the station is more than 100 crores to 500 crores, and the proposed outward passenger handled at the station is more than 10 to 20 million (Ministry of Railways, 2018). This station is the only station that falls under NSG 2 in the Konkan Railway, which passes from Roha to Thokur (Banerjee, Raghuram and Rangaraj, 2000). 690 self-administrated questionnaires were distributed between May 2023 to April 2024 using convenience sampling techniques (Singh, 2016; Kumuthadevi, 2019; Mageshwarii and Vasanthi, 2020; Saw *et al.*, 2020; Beach *et al.*, 2022) The questionnaire was provided to willing participants to ensure accurate and reliable results. Out of the 690 questionnaires submitted, 12 were rejected owing to incomplete or invalid responses, leaving 678 valid responses for processing, resulting in an effective response rate of 98.26%. Table 2 presents a summary of the respondent profile.

Table 2: Demographic Profile (n=678)

Variable	Classification	Frequency	Percentage
Gender	Male	373	55
	Female	305	45
Age (Years)	Below 18	29	4
	18-30	104	15
	31-40	409	60
	41-50	59	9
	51-60	52	8
	Above 60	25	4
Marital Status	Unmarried	395	58
	Married	283	42
Educational Qualification	Below SSC	25	4
	SSC/X	40	6
	HSSC/XII	105	15
	Diploma	102	15
	Graduation	284	42
	Post Graduation	114	17
	Other/s	8	1
Occupation	Student	62	9
	Salaried	262	39
	Businessperson	40	6
	Professional	200	29
	Self-Employed	71	10
	Unemployed	25	4
	Other/s	18	3
Annual Income	Below Rs. 3,00,000	381	56
	Rs. 3,00,001 to Rs. 5,00,000	140	21
	Rs. 5,00,001 to Rs. 7,00,000	60	9
	Rs. 7,00,001 to Rs. 10,00,000	55	8
	Above Rs. 10,00,001	42	6
Nature of Residence	Municipality	394	58
	Village Panchayat	284	42
Travelling with	Family/Relatives	263	39
	Friends/Colleagues	279	41
	Sole	136	20

Variable	Classification	Frequency	Percentage
Purpose of your travel	General	72	11
	Regular Office	211	31
	Business Tour	81	12
	Education	104	15
	Vacation	198	29
	Other/s	12	2

Data Analysis And Tools:

The data in this study was analysed using IBM SPSS statistics version 27.0. The demographic profiles of the respondents are examined as part of the systematic data analysis process. The researcher conducted the analysis using Smart-PLS 4 software.

Common-Method Variance Bias Method:

This study utilised the One Factor Test (Maxwell and Harman, 1968), to assess the potential presence of common-method variance bias among variables. The researcher followed the principles and methodology outlined by (Podsakoff *et al.*, 2003) to conduct a one-factor test, as described by (Maxwell and Harman, 1968). To conduct this test, all the measurement scale items were subjected to a principal component analysis with varimax rotation. This allowed for the identification of any indications of a single factor through factor analysis. The outcome was derived from five distinct components (namely counter services, waiting room facilities, public announcement, platform service, and staff behaviour) obtained from 34 measurement items converged over 6 iterations of rotation.

The subsequent section of the study concentrated on evaluating passenger satisfaction, employing these five service quality dimensions as independent variables. The 34 measurement items were analysed and passenger satisfaction was evaluated using five specific criteria. These were evaluated using a five-point Likert scale, from 1 (Highly Dissatisfied) to 5 (Highly Satisfied). The results substantiated the rigorous methodology and its emphasis on service quality factors to improve passenger satisfaction in the context of Konkan Railway services.

Measurement Model:

The measuring model was assessed for reliability and validity (Joseph E Hair, Jr. G.Tomas M. Hult, Christion M. Ringle, 2014). The study used composite reliability, also known as internal consistency, and convergent & discriminant validity to test the measurement model (Hair *et al.*, 2019; Ibrahim *et al.*, 2023)

Internal Consistency:

Reliability and validity were employed to evaluate the outer strength of the measurement model, which ensures its accuracy and credibility, for use in structural equation modelling. The composite reliability (rho_a) is a measurement used to assess the internal consistency and reliability of the construct. Convergent and Discriminant validity assess the indicators of the same construct are related and distant, respectively (Ibrahim *et al.*, 2023).

Convergent Validity:

It is the degree of the positive correlation between one measure of a specific construct and another distinct construct. The study assessed convergent validity using the following criteria: average variance extracted (AVE) and outer loading. The model produced favourable outcomes, with the outer loading values exceeding the 0.70 limits and the AVE values fulfilling the rule of thumb i.e. above 0.5 recommended by (Hair *et al.*, 2019).

Table 3: Details of Cronbach alpha, Composite Reliability, AVE and Outer Loading.

Constructs	Cronbach's alpha	rho_a	AVE	Outer Loading
Counter Services -CS	0.834	0.835	0.602	0.753-0.796
Waiting Room Facilities-WRF	0.868	0.869	0.656	0.746-0.838
Public Announcement-PA	0.849	0.85	0.571	0.72-0.786
Platform Services-PS	0.888	0.889	0.599	0.727-0.798
Staff Behaviour-SB	0.888	0.889	0.642	0.745-0.833
Passenger Satisfaction -PAS	0.798	0.804	0.555	0.658-0.802

Note: rho_a: Dijkstra-Henseler's rho_a, AVE: Average Variance Extracted.

Discriminant Validity:

This study used the Fornell-Larcker criterion and Heterotrait-Monotrait ratio (HTMT) to evaluate discriminant validity. The Fornell-Larcker criterion weighs the square root of each construct's AVE over its correlations with various other constructs (Ibrahim *et al.*, 2023). (Table 4) demonstrates that the study passes the Fornell-Larcker criterion for discriminant validity, which states that every construct square root of AVE surpasses its maximum squared correlation with the other constructs. It also reveals that, except for passenger pleasure, HTMT ratios are significantly lower than the recommended 0.85 level. In general, these findings provide good discriminant validity for all components in the proposed model.

Table 4: Discriminant Validity (Fornell-Larcker criterion and HTMT).

Constructs	Counter Services	Passenger Satisfaction	Platform Services	Public Announcements	Staff Behaviour	Waiting Room Facilities
Counter Services	0.776	0.743	0.629	0.545	0.584	0.61
Passenger Satisfaction	0.904	0.745	0.739	0.708	0.658	0.686
Platform Services	0.729	0.874	0.774	0.549	0.58	0.542
Public Announcements	0.645	0.858	0.627	0.755	0.456	0.47
Staff Behaviour	0.678	0.794	0.652	0.523	0.801	0.491
Waiting Room Facilities	0.715	0.822	0.616	0.543	0.56	0.81

Note: The square roots of the AVE are diagonal and bold. Below the diagonal elements are the HTMT values, and above the diagonal elements is the correlation between the construct's values.

Result:

Structural Model:

As part of the Structural model assessment, the first step is to assess the multi-collinearity through Variance Inflation Factors (VIF). VIF values were found to be less than the recommended threshold of 5 in the sample collected and the overall sample (Joseph E Hair, Jr. G.Tomas M. Hult, Christion M. Ringle, 2014) indicates that no multi-collinearity issues exist in the sample.

Furthermore, the proposed hypotheses are tested, and the result in Table 5 shows that all the hypotheses were supported in the complete sample. The result shows that the counter service at the railway station, waiting room facilities on the platforms, public announcements to inform passengers, platform services and staff behaviour are significant towards passenger satisfaction in Konkan Railway at Madgaon Station.

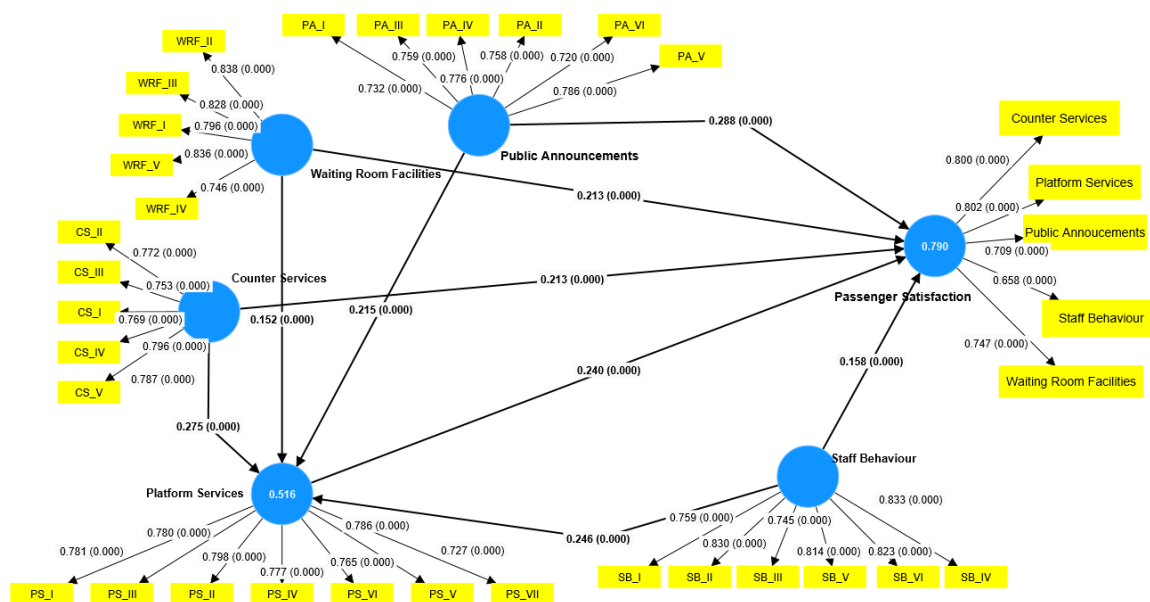


Fig. no. 2 Structural Model

Table 5: Hypotheses Testing results

H. No.	Relationship	β value	T -Value	P values	Remarks
H1 _a	Counter Services -> Passenger Satisfaction	0.213	6.738	0	Accepted
H1 _b	Waiting Room Facilities -> Passenger Satisfaction	0.213	8.344	0	Accepted
H1 _c	Public Announcements -> Passenger Satisfaction	0.288	10.906	0	Accepted
H1 _d	Platform Services -> Passenger Satisfaction	0.24	8.37	0	Accepted
H1 _e	Staff Behaviour -> Passenger Satisfaction	0.158	5.184	0	Accepted

The table shows the relationship between various off-board service quality determinants and passenger satisfaction in the Konkan Railway, with all sub-hypotheses (a to e) are accepted based on significant β and P values. Counter services and Waiting Room Facilities show a β value of 0.213, indicating a strong positive impact on passenger satisfaction, supported by high T-values of 6.738 and 8.344, respectively. Public Announcements have the highest impact, with a β value of 0.288 and T-value of 10.906, underscoring their critical role in passenger satisfaction. Platform service also significantly influences satisfaction with a β value of 0.24 and a T-value of 8.37. Lastly, staff behaviour contributes positively with a β value of 0.158 and a T-value of 5.184. All relationships are statistically significant with P values less than 0.05 indicating that improvements in these areas can substantially enhance passenger satisfaction.

Mediation Analysis:

The result of the mediation relationship is presented further, and the results are reported in Table 6. The results revealed a significant indirect effect of counter service on passenger satisfaction through platform services (H2_a: β = 0.066, t value=4.964, p <0.0). The total effect of counter service on passenger satisfaction (β =0.279, t value=8.187, p <0.0), with the inclusion of the mediator, the effect of counter service on passenger satisfaction was still significant (β =0.213, t value=6.738, p <0.0). Further analysis of the mediating role of platform service on waiting room facilities and passenger satisfaction i.e. (H2_b: β = 0.036, t value=3.307, p <0.001). The total effect of waiting room facilities on passenger satisfaction (β =0.25, t=8.836, p <0.0), with the inclusion of the mediator, the effect of waiting room facilities on passenger satisfaction was still significant (β =0.152, t value =3.536, p <0.0). Furthermore, analysis of the mediating role of platform service on public announcement and passenger satisfaction was significant i.e. (H2_c: β = 0.051, t value=4.364, p <0.0). The total effect of the public announcement on passenger satisfaction (β =0.34, t value =12.175, p <0.0), with the inclusion of the mediator, and the effect of waiting room facilities on passenger satisfaction was still significant (β =0.215, t value =5.264, p <0.0). At last, the mediating role of platform service on staff behaviour and passenger satisfaction was significant i.e. (H2_d: β = 0.059, t value=4.9, p <0.0). The total effect of waiting room facilities on passenger satisfaction (β =0.217, t value =6.998, p <0.0), with the inclusion of the mediator, and the effect of staff behaviour on passenger satisfaction was still significant (β =0.059, t value =4.9, p <0.0). The indirect effect shows a complementary partial mediating role of off-board services in the relationship between counter services, waiting room facilities, public announcements, and staff behaviour to passenger satisfaction (Avkiran and Ringle, 2018). Hence, all mediating hypotheses are supported.

Table 6: Mediation analysis result:

Total Effect			Direct Effect			Remark	H. No.	Relationship	Indirect Effect			Percentile bootstrap 95% confidence interval		Remark
β	T value	P values	β	T value	P values				β	T value	P values	2.50 %	97.50 %	
0.279	8.187	0	0.275	6.382	0	Significant	H2 _a	CS -> PS -> PAS	0.066	4.964	0	0.041	0.093	Accepted
0.25	8.836	0	0.152	3.536	0	Significant	H2 _b	WRF -> PS -> PAS	0.036	3.307	0.001	0.016	0.059	Accepted
0.34	12.175	0	0.215	5.264	0	Significant	H2 _c	PA -> PS -> PAS	0.051	4.364	0	0.03	0.076	Accepted
0.217	6.998	0	0.246	6.159	0	Significant	H2 _d	SB -> PS -> PAS	0.059	4.9	0	0.037	0.084	Accepted

Moderation Analysis:

In moderation analysis, the primary step to perform is Measurement Invariance of Composite Models (MICOM) and found that in steps 2, step 3a (mean), and step 3b (variance), all the p-values are above the significance level hence the researcher analyse the gender as mediators and analyse Multi-Group Analysis (MGA) to find the impact of gender on off-board services. As a final step, the researcher assessed (Table 7), that no significant difference existed in the effect of gender in terms of the counter service, platform service, staff behaviour, waiting room facilities to platform service to passenger satisfaction. Further, the researcher found a significant relationship between waiting room facilities and passenger satisfaction except one, that means when the gender uses these services, there is a difference in the satisfaction of males and females.

Table 7: Moderation result.

Paths	Path difference in Gender	1-tailed (p-value)	2-tailed (p-value)
Counter Services -> Passenger Satisfaction	0.059	0.173	0.346
Counter Services -> Platform Services	-0.109	0.849	0.303
Platform Services -> Passenger Satisfaction	0.07	0.131	0.263
Public Announcements -> Passenger Satisfaction	0.031	0.28	0.56
Public Announcements -> Platform Services	-0.002	0.508	0.984
Staff Behaviour -> Passenger Satisfaction	0.023	0.352	0.704
Staff Behaviour -> Platform Services	0.097	0.121	0.242
Waiting Room Facilities -> Passenger Satisfaction	-0.175	0.999	0.001
Waiting Room Facilities -> Platform Services	0.008	0.47	0.94

Discussion:

In the current analysis, the influence of the off-board services determinants between the mediating role of platform service and gender plays as moderating effect on passenger satisfaction.

The outcome exposed a significant impact of off-board facilities on the overall passengers' satisfaction, specially within Konkan Railway services. Regarding counter service, results highlight the necessity of adequate ticket availability during peak times, a clear display of train information and reservation charts, the enquiry counter always has staff, and retiring room booking is available. Suggestions include the enhancement of installing complaint and suggestion boxes, also boost the number of ticketing counters or workers at peak times (Dr. Shilpi, 2018). It identifies the need for a passenger-focused approach to improve the counter services and gain a competitive benefit at the station (Fodness and Murray, 2007). Further, waiting room facilities significantly impact passenger satisfaction due to cleanliness, availability of comfortable resting chairs, appropriate bathrooms and washrooms, functional lighting, fans, charging outlets, and accessible free Wi-Fi (Verbich and Ahmed, 2016). Also, the efficient waiting facilities improve passenger comfort before the journey starts (Lunke, 2020). Contrary to this (Sarin, 2011), found a negative impact on passenger satisfaction. The analysis of the study states the importance of public announcements like electronic media announcements are clear, understandable and multilingual, frequent updates to train information, advance notice of arrival and departure times, an announcement for train schedule modifications or delays are made promptly, platform numbers and other important train details are announced in advance. Additionally, staff behaviour demonstrates professional communication skills and discipline, ensures safety during platform emergencies, shows a willingness to help, demonstrates empathy when addressing complaints, and are polite and helpful which significantly impacts passengers' satisfaction. It is also observed that staff members' conduct has an encouraging effect on productivity. Additionally, efforts have been made to increase sustainability and cost-effectiveness in the railway transportation system, further there is a need to comprehend passenger comfort and explore potential strategies and solutions to improve the experience (Patel and D'Cruz, 2018). Lastly, platform services play an important role in passenger satisfaction; it include all off-board services. Shopping has a significant impact on railway passenger satisfaction, with identification for potential growth (Ghosh, Ojha and Geetika, 2017). Passengers have a favourable opinion of amenities such as the reservation charts and refreshment counter but, are dissatisfied with the availability of drinking water, porter behaviour and refreshment quality (S. Gandhimathi, 2014).

At the railway station, platform services such as adequate and easily accessible bookstalls, convenience stores, food & beverage stalls and vendors, baggage trolleys & porter services, proper ventilation, seating arrangements, and digital train information display are key to passengers' satisfaction. The outcome of the analysis demonstrated a positive and substantial impact of counter service, waiting room facilities, public announcement, and staff behaviour on passenger satisfaction and can enhance the satisfaction role. The result of the study consists of (Park and Park, 2018) the impact of servicescape (predefined environment) that influences the attributes of passenger satisfaction. The study suggests that effective implementation of platform amenities enhances passenger comfort and directly impacts satisfaction.

Multi-group analysis revealed that there is an insignificant difference in the impact of gender on counter service, public announcement, staff behaviour to passenger satisfaction and counter service, waiting room facilities, public announcement, and staff behaviour to platform services, satisfaction in the waiting rooms differed significantly. This shows an increasing similarity in the male and female responses but waiting room facilities to passenger satisfaction have different significance between gender groups. The station services emphasise the role of moderating variable effects on passenger satisfaction (Sugianto, 2017), the gender perspective exposes that the technologies which are used at the station can positively impact the satisfaction level with differences across genders (Rubio-Andrada *et al.*, 2023).

Finding:

The study reveals critical insights into how various off-board service quality determinants affect passenger satisfaction. The researcher highlights that off-board services such as counter service, waiting room facilities, platform services, public announcements and staff behaviour significantly influence overall passenger satisfaction. The analysis shows that efficient counter services, platform services and well-maintained waiting room facilities are essential for enhancing passenger experiences; the moderating role of gender indicates that male and female passengers have no different expectations and priorities, with females and males, but women place higher importance on safety & security, males may prioritise convenience and efficiency. The mediating effect of platform services underscores their crucial role in bridging the gap between off-board services and overall satisfaction. Improvement in platform services including cleanliness, seating availability and information systems, significantly enhance the travel experience, thereby increasing passenger satisfaction. These findings suggest that targeted improvements in off-board services considering gender-specific needs and focusing on platform services can substantially elevate passenger satisfaction levels in the Konkan Railway.

Recommendations:

According to the study's findings, several recommendations can be proposed to enhance passenger satisfaction in the Konkan Railway:

Invest in improving the off-board amenities like cleaning, regular maintenance and updates to these services can significantly boost passenger satisfaction. Implement and maintain robust safety measures, including surveillance, patrolling personnel, and emergency response protocols. Visible security measures are particularly important for enhancing the perceived safety of female passengers. Streamline the ticketing process with advanced booking systems and training the staff in customer service skills to reduce wait times and improve the overall booking experience. Ensure that the platform is clean, well-lit, and equipped with necessary amenities such as restrooms, and information displays. These improvements can enhance the overall travel experience and act as mediating factors in passenger satisfaction. Recognise and address the different needs of male and female passengers. Implement continuous monitoring and feedback systems to gather real-time passenger insights and address issues promptly. This will help in maintaining high service standards and adapting to changing passenger needs.

Conclusion:

Many studies have been conducted on passenger satisfaction at Konkan Railway, specifically on counter services, waiting room facilities, public announcements at the station, staff behaviour and platform services outlining both, positive and negative aspects of railway platform services (Geetika and Nandan, 2010). This study provides valuable insight by identifying the factors that influence passenger satisfaction with the quality of off-board services offered by Konkan Railway Station at Madgaon. This research is based on empirical evidence.

The announcements at the station are clear and understandable, such as frequent train information and platform detail announcements, announcements in multiple languages, advance announcements of train arrival and departure time, prompt announcements of train rescheduling, modifications or delays, and other details. The behaviour of staff incorporates aspects like the demonstration of professional communication skills, the assurance of safety during platform emergencies, the exhibition of professional and disciplined behaviour, the display of willingness to assist, the demonstration of empathy while addressing complaints and the display of

politeness and helpfulness by counter service staff. At the platform, a wide range of services such as pleasant ambience, accessible bookstalls and convenience stores, food & beverage stalls and vendors, baggage trolleys and porter services, proper ventilation, seat arrangement for passengers and accurate digital train information available. The aforementioned characteristics are determinants of overall satisfaction with Konkan Railway. The study guides the Konkan Railway administration in identifying areas for service improvement and enhancing happiness, particularly in the context of off-board services.

Limitation Of The Study:

Although the analysis contributed to passenger satisfaction in the study, there are some limitations. Initially, convenience sampling was employed, rendering the response-refusal rate indeterminable. Consequently, the outcome cannot be universally applied. Nevertheless, despite being tested with a convenience sample, the model is fundamentally exploratory and offers a solid foundation for further research. The research is only done on NSG-2 where other NSG, SG and HS are not taken into consideration for analysis. Future studies could cover all NSG and HS of Konkan Railway station. More determinants can be determined related to counter services, waiting room facilities, public announcements, staff behaviour, and platform services. Apart from the above services, many services can be considered off-board services. Last but not the least, future studies could be incorporated with Indian Railway, which can capture the real emotions of the passengers during the on-board journey and take benefits from off-board services and analyse how they are satisfied and loyal towards Indian Railway and Konkan Railway.

Scope for Further Research:

Future research could build on this study's findings by adopting a longitudinal design to capture changes in passenger satisfaction over time. Expanding the geographic scope to include other railway networks would provide comparative insights and enhance the generalizability of the results. Future research scope to explore a wider range of service quality determinants like ticket pricing, travel time, and technological advancement in railway services. Utilising qualitative methods, such as interviews and focus groups, can yield more profound insights into passenger experiences and expectations. Experimental designs to test the effectiveness of specific service improvements and the development of new measurement models for service quality, addressing the limitation of existing techniques like SERVQUAL and SERVPERF, are also recommended. Lastly, future research should look into combining new technology, such as real-time feedback systems and data analytics, to monitor and enhance passenger satisfaction continuously.

References:

- Anna, C., Antonello, D.A. and Paletta, A. (2014)** 'A Panel Data Approach to Evaluate the Passenger Satisfaction of a Public Transport Service', *Procedia Economics and Finance*, 17(14), pp. 231–237. Available at: [https://doi.org/10.1016/s2212-5671\(14\)00708-4](https://doi.org/10.1016/s2212-5671(14)00708-4).
- Avkiran, N.K. and Ringle, C.M. (2018)** *Partial least squares structural equation modeling: Recent advances in banking and finance*, Springer. Available at: <http://www.springernature.com/series/6161>.
- Banerjee, B., Raghuram, G. and Rangaraj, N. (2000)** 'Management Case Konkan Railway Corporation Limited', 25(1), pp. 89–109.
- Beach, C. et al. (2022)** 'Attitude Of Passengers Towards Railway Service- A study With Reference To International Journal of Current Advanced Research', *International Journal of Current Advanced Research*, (October 2018), pp. 3–7. Available at: <https://doi.org/10.24327/ijcar.2018.11049.1903>.
- Bhattarai, S.T. (2019)** 'Passenger Satisfaction towards Services of Public Transportation: Butwal – Bhairahawa', *International Journal of Economics and Management Studies*, 6(11), pp. 29–33. Available at: <https://doi.org/10.14445/23939125/ijems-v6i11p104>.
- Bonett, D.G. and Wright, T.A. (2015)** 'Cronbach's alpha reliability: Interval estimation, hypothesis testing, and sample size planning', *Journal of Organizational Behavior*, 36(1), pp. 3–15. Available at: <https://doi.org/10.1002/job.1960>.
- Cao, J. et al. (2016)** 'The gaps in satisfaction with transit services among BRT, metro, and bus riders: Evidence from Guangzhou', *Journal of Transport and Land Use*, 9(3), pp. 97–109. Available at: <https://doi.org/10.5198/jtlu.2015.592>.
- Darley, W.K. and Smith, R.E. (1995)** 'Gender differences in information processing strategies: An empirical test of the selectivity model in advertising response', *Journal of Advertising*, 24(1), pp. 41–56. Available at: <https://doi.org/10.1080/00913367.1995.10673467>.
- Daud, K.A.M., , Nik Zulkarnaen Khidzir, A.R.I. and Abdullah, F.A. (2018)** 'Validity and reliability of instrument to measure social media skills among small and medium entrepreneurs at Pengkalan Datu River', *International Journal of Development and Sustainability*, 7(3), pp. 1026–1037. Available at: www.isdsnet.com/ijds.
- Dr. Shilpi, M.S. (2018)** 'A CRITICAL REVIEW ON FACTORS AFFECTING SATISFACTION Ms Shikha and 2 Dr . Shilpi', *Journal of Management Research and Analysis (JMRA)*, 05(02), pp. 216–220. Available at: <http://jmraonline.comhttp://jmraonline.com>.
- Erlangga, A., Widodo and Siahaan, D.L. (2021)** 'The Loyalty of Airport Railink Service Users with Satisfaction Mediation', *International Journal of Research and Review*, 8(8), pp. 712–721. Available at: <https://doi.org/10.52403/ijrr.20210894>.
- Fodness, D. and Murray, B. (2007)** 'Passengers' expectations of airport service quality', *Journal of Services Marketing*, 21(7), pp. 492–506. Available at: <https://doi.org/10.1108/08876040710824852>.
- Geetika and Nandan, S. (2010)** 'Determinants of Customer Satisfaction on Service Quality: A Study of Railway Platforms in India', *Journal of Public Transportation*, 13(1), pp. 97–113. Available at: <https://doi.org/10.5038/2375-0901.13.1.6>.
- Ghosh, P., Ojha, M.K. and Geetika (2017)** 'Determining passenger satisfaction out of platform-based amenities: A study of Kanpur Central Railway Station', *Transport Policy*, 60(August), pp. 108–118. Available at: <https://doi.org/10.1016/j.tranpol.2017.09.007>.
- Glenn L. Koonce, M.D.K. (2003)** 'Analysis of the Reliability and Validity of a Mentor's Assessment for Principal Internships', *Sage publications*, 15(2), pp. 33–48.
- Gopal Vasanthi, M. et al. (2023a)** 'Passenger satisfaction with cleanliness and other service quality dimensions and gender as a moderator: Evidence from Indian Railways', *Cogent Business and Management*, 10(1). Available at: <https://doi.org/10.1080/23311975.2023.2183568>.
- Gopal Vasanthi, M. et al. (2023b)** 'Passenger satisfaction with cleanliness and other service quality dimensions and gender as a moderator: Evidence from Indian Railways', *Cogent Business and Management*, 10(1).

Available at: <https://doi.org/10.1080/23311975.2023.2183568>.

Hair, J.F. et al. (2019) 'When to use and how to report the results of PLS-SEM', *European Business Review*, 31(1), pp. 2–24. Available at: <https://doi.org/10.1108/EBR-11-2018-0203>.

Iacobucci, D. and Ostrom, A. (1993) 'Gender differences in the impact of core and relational aspects of services on the evaluation of service encounters', *Journal of Consumer Psychology*, 2(3), pp. 257–286. Available at: [https://doi.org/10.1016/S1057-7408\(08\)80017-4](https://doi.org/10.1016/S1057-7408(08)80017-4).

Ibrahim, A.N.H. et al. (2023) 'Modelling of Passenger Satisfaction and Reuse Intention with Monorail Services in Kuala Lumpur, Malaysia: A Hybrid SEM-ANN Approach', *Mathematics*, 11(15). Available at: <https://doi.org/10.3390/math11153361>.

Jaiswal, S. et al. (2022) 'The socio-economic and environmental impact of a large infrastructure project: The case of the Konkan Railway in India', *RUHR Economic Papers* [Preprint], (February). Available at: <https://www.econstor.eu/handle/10419/250073%0Ahttps://www.econstor.eu/bitstream/10419/250073/1/1789103053.pdf>.

Joseph E Hair, Jr. G.Tomas M. Hult, Christion M. Ringle, M.S. (2014) *PARTIAL LEAST SQUARES STRUCTURAL EQUATION MODELING (PLS-SEM)*. SAGE Publication India Pvt. Ltd.

Jugessur, Y.S.M.F. (2022) 'Reliability and Internal Consistency of data : Significance of Calculating Cronbach ' s Alpha Coefficient in Educational Research', *International Journal of Humanities and Social Science Invention*, 11(4), pp. 9–14. Available at: <https://doi.org/10.35629/7722-1104030914>.

Karatepe, O.M. (2011) 'Service quality, customer satisfaction and loyalty: The moderating role of gender', *Journal of Business Economics and Management*, 12(2), pp. 278–300. Available at: <https://doi.org/10.3846/16111699.2011.573308>.

Kumuthadevi, K. (2019) 'A Study on Passenger ' s Perception on Service Quality of Southern Railways in Kerala', *International Journal of Research in Engineering, IT and Social Sciences.*, 09(5), pp. 189–193.

Kwok, S.Y., Jusoh, A. and Khalifah, Z. (2016) 'The influence of Service Quality on Satisfaction: Does gender really matter?', *Intangible Capital*, 12(2), pp. 444–461. Available at: <https://doi.org/10.3926/ic.673>.

Lunke, E.B. (2020) 'Commuters' satisfaction with public transport', *Journal of Transport and Health*, 16(February). Available at: <https://doi.org/10.1016/j.jth.2020.100842>.

Mageshwarii, G. V. and Vasanthi, S. (2020) 'A study on satisfaction of passengers towards railway service in tiruchirappalli junction', *International Journal of Scientific and Technology Research*, 9(1), pp. 2843–2847.

Mat, A. et al. (2019) 'The influence of service quality and passenger satisfaction towards Electric Train Services (ETS): A PLS-SEM approach', *Foundations of Management*, 11(1), pp. 57–64. Available at: <https://doi.org/10.2478/fman-2019-0005>.

Mat Nawi, F.A. et al. (2020) 'a Review on the Internal Consistency of a Scale: the Empirical Example of the Influence of Human Capital Investment on Malcom Baldrige Quality Principles in Tvet Institutions', *Asian People Journal (APJ)*, 3(1), pp. 19–29. Available at: <https://doi.org/10.37231/apj.2020.3.1.121>.

Maxwell, A.E. and Harman, H.H. (1968) 'Modern Factor Analysis.', *Journal of the Royal Statistical Society. Series A (General)*, 131(4), p. 615. Available at: <https://doi.org/10.2307/2343736>.

Maxwell Sandada, B.M. (2015) 'THE MEDIATING INFLUENCE OF PASSENGER SATISFACTION ON THE RELATIONSHIP BETWEEN PASSENGER LOYALTY PROGRAMMES AND PASSENGER LOYALTY', *Most*, 8(2), pp. 13–15.

Ministry of Railways, G. of I. (2018) 'Comprehensive instruction for provision of Passenger Amenities and user facilities at stations.'

Park, K. and Park, J.W. (2018) 'The effects of the servicescape of airport transfer amenities on the behavioral intentions of transfer passengers: A case study on Incheon International Airport', *Journal of Air Transport Management*, 72(May), pp. 68–76. Available at: <https://doi.org/10.1016/j.jairtraman.2018.08.002>.

Patel, H. and D'Cruz, M. (2018) 'Passenger-centric factors influencing the experience of aircraft comfort', *Transport Reviews*, 38(2), pp. 252–269. Available at: <https://doi.org/10.1080/01441647.2017.1307877>.

- Podsakoff, P.M. et al. (2003)** 'Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies', *Journal of Applied Psychology*, 88(5), pp. 879–903. Available at: <https://doi.org/10.1037/0021-9010.88.5.879>.
- R.Karthikeyan, U. Geetha, E.M. (2015)** 'RAIL SERVICE QUALITY AND CUSTOMER SATISFACTION', pp. 1–12.
- Rubio-Andrada, L. et al. (2023)** 'Passengers satisfaction with the technologies used in smart airports: An empirical study from a gender perspective', *Journal of Air Transport Management*, 107(November 2021). Available at: <https://doi.org/10.1016/j.jairtraman.2022.102347>.
- S. Gandhimathi*, D.S.S. (2013)** 'A Study on Passenger ' s Satisfaction towards Railway Services in Coimbatore Junction', *International Journal of Applied Research and Studies*, 2(11).
- S. Gandhimathi, D.S.S. (2014)** 'A STUDY ON PASSENGERS' PERCEPTION AND SATISFACTION TOWARDS SERVICES OFFERED BY SOUTHERN RAILWAYS IN COIMBATORE JUNCTION', *INTERCONTINENTAL JOURNAL OF MARKETING RESEARCH REVIEW*, 2(11), pp. 10–16.
- Sarin, V. (2011)** 'Customer Satisfaction Determinants for Quality of Service: A study of New Delhi Railway Platform', *PCTE Journal of Computer Science* [Preprint].
- Saw, Y.Q. et al. (2020)** 'Passenger satisfaction towards metro infrastructures, facilities and services', *Transportation Research Procedia*, 48, pp. 3980–3995. Available at: <https://doi.org/10.1016/j.trpro.2020.08.290>.
- Shanbhag, A.B., Walia, R. and Borges, S.D. (2001)** 'The impact of Konkan Railway project on the avifauna of Carambolim Lake in Goa', *Zoos' Print Journal*, 16(6), pp. 503–508. Available at: <https://doi.org/10.11609/JoTT.ZPJ.16.6.503-8>.
- Sharma, B. (2016)** 'A focus on reliability in developmental research through Cronbach's Alpha among medical, dental and paramedical professionals', *Asian Pacific Journal of Health Sciences*, 3(4), pp. 271–278. Available at: <https://doi.org/10.21276/apjhs.2016.3.4.43>.
- Simcox, D.J.A. (2018)** 'Problems with the Use of Chronbach ' s Alpha as a Test of Scale Reliability for Social Science Surveys', *International Journal of Social Science and Humanities Research*, 6(2), pp. 225–229.
- Singh, S. (2016)** 'Assessment of Passenger Satisfaction with Public Bus Transport Services: A Case Study of Lucknow City (India)', *Studies in Business and Economics*, 11(3), pp. 107–128. Available at: <https://doi.org/10.1515/sbe-2016-0039>.
- Sugianto, D.K. (2017)** 'The moderating effect of age , income, gender, expertise , loyalty Program, and critical incident on the influence of customer satisfaction Towards customer loyalty in Airline industry: a Case of Pt . X', *iBuss Management*, 5(1), pp. 70–83.
- Taber, K.S. (2018)** 'The Use of Cronbach's Alpha When Developing and Reporting Research Instruments in Science Education', *Research in Science Education*, 48(6), pp. 1273–1296. Available at: <https://doi.org/10.1007/s11165-016-9602-2>.
- Vanniarajan, T. and Stephen, A. (2008)** 'Railqual and Passengers Satisfaction: An Empirical Study in Southern Railways', *Asia Pacific Business Review*, 4(1), pp. 64–75. Available at: <https://doi.org/10.1177/097324700800400107>.
- Verbich, D. and Ahmed, E.G. (2016)** 'The pursuit of satisfaction: Variation in satisfaction with bus transit service among riders with encumbrances and riders with disabilities using a large-scale survey from London, UK', *Transport Policy*, 47, pp. 64–71. Available at: <https://doi.org/10.1016/j.tranpol.2015.12.009>

Hybrid Modelling Approach for Land Use Change Prediction and Land Management in the Coronie District of Suriname

Ms. Tamara van Ommeren-Myslyva

Anton de Kom University of Suriname, Paramaribo, Republic of Suriname
Ministry of Spatial Planning and Environment, Paramaribo, Republic of Suriname

Ms. Usha Satnarain

Anton de Kom University of Suriname, Paramaribo, Republic of Suriname

Ms. Femia Wesenhagen

Ministry of Spatial Planning and Environment, Paramaribo, Republic of Suriname

Abstract

Monitoring and predicting changes in land use play a crucial role in addressing environmental challenges and ensuring effective land use management. Reliable models aid in planning sustainable development, safeguarding biodiversity, and efficiently managing natural resources. This study aims to identify land use changes in the Coronie district of Suriname from 2016 to 2024 and predict changes for 2034 and 2044. Sentinel-2 images were used to analyze land use change patterns and predict future trends. The Random Forest algorithm was employed to classify the various land use classes with high accuracy and reliability. A hybrid approach, combining Markov chain analysis with cellular automata, multilayer perceptron, support vector machines, and logistic regression, was used to predict future land use dynamics for 2034 and 2044. The support vector machine-Markov chain hybrid predictive model, incorporating an agricultural land expansion transition sub-model, demonstrated an impressive accuracy of 96.05%, outperforming the rest of hybrid models. This model is recommended for generating land use change prediction maps, which can serve as a crucial baseline for sustainable land use management.

Keywords – Land Cover, Dynamics, Prediction, Hybrid Models, Land Use Management.

Introduction

Land use change as a critical driver of environmental and socio- economic transformations, has significant impacts on the both ecosystems and human livelihoods. Analyzing spatiotemporal trends in land use and land cover (LULC) change is pivotal for gaining deep insights that are vital to effective and sustainable land management and environmental conservation (van Ommeren-Myslyva et al., 2024; Devi & Shimrah, 2023; Girma et al., 2022). The Surinamese district of Coronie due to its location, in the North- west of Suriname, plays a crucial role in the future developments of the country, especially with the expecting economic developments and faces increasing pressure on its land due to various factors such as agricultural expansion, infrastructure development, and natural circumstances like a dynamic coast and climate change. Thus, understanding these changes is crucial for the region's sustainable development and environmental conservation. Regardless of the evident occurrence of land use changes in Commewijne, a notable gap exists in studies specifically addressing the detection of current trends and the prediction of future dynamics in regional land use and land cover. This research is part of a project on LULC change modelling for the next 20 years, conducted by the Ministry of Spatial Planning and the Environment of Suriname (ROM) for all 10 districts in the country, with the Commewijne district already completed (van Ommeren et al., 2024). The outcomes of the project will contribute to the ROM's initiative to establish a Geospatial Intelligence Hub (GIH) in Suriname, aimed at storing and making geo- data accessible to the general public. The data provided by the GIH will support sustainable spatial planning, effective natural resource management, environmental protection, and climate change mitigation efforts.

Literature Review

LULC change modelling plays an essential role in understanding and managing environmental dynamics, natural resources, and land assets. It is crucial for environmental monitoring, as it helps detect changes in ecosystems and biodiversity (Kafy et al., 2020; Belgiu & Csillik, 2018). Predictive models are indispensable for evaluating the impacts of urbanization, deforestation, and agricultural expansion on natural habitats (Song et al., 2020; Phiri & Morgenroth, 2017). Effective management of natural resources – including forests, wetlands, and other vital ecosystems – also relies on accurate LULC models to predict changes and guide conservation efforts (Tehrany et al., 2020; Xie et al., 2019). Additionally, LULC change models are critical for planning sustainable

agricultural practices, urban development, and infrastructure projects (Adhikari & Southworth, 2018; Roy et al., 2018). These models offer valuable insights into land suitability for various uses, helping to prevent land degradation and ensure optimal use of resources (Lambin & Meyfroidt, 2019; Aloqaili et al., 2021). Furthermore, LULC modelling plays an important role in climate change mitigation by enhancing our understanding of the carbon sequestration potential of different land covers (Deng et al., 2020; Luo et al., 2021). Remote sensing (RS) has become a crucial tool for monitoring changes in land use and land cover by utilizing high-resolution satellite imagery, enabling precise mapping and assessment of LULC transformations (Abbas et al., 2023; Abdullahi & Pradhan, 2016). Numerous studies have explored LULC changes using various satellite datasets, including Landsat (El Ghouli et al., 2023; Hussain et al., 2022), MODIS (Al-Hamdan et al., 2017), RapidEye (Kafy et al., 2021), Sentinel (Guzder-Williams et al., 2023; Sánchez-Espinosa & Schröder, 2019), and SPOT (McCarthy et al., 2018). The integration of RS with GIS technologies provides a robust platform for analyzing LULC changes (Dey et al., 2021). Researchers worldwide have employed various methods to predict future land use and land cover changes (Abbas et al., 2023). LULC change prediction methods involve advanced techniques to forecast future land cover and use based on historical data and trends (van Ommeren-Myslyva et al., 2024). Frequently employed models for predicting land use changes include statistical models (Yeh & Liaw, 2021), Cellular Automata (CA) models (Muhammad et al., 2021), Markov Chain (MC) models (Mohamed & Worku, 2020), hybrid models (Asif et al., 2023), and multi-agent-based models (Robinson et al., 2021). Among these, hybrid models, which combine different predictive methods to leverage the strengths of each approach, produce more precise projections of future changes. The MC model is widely used for LULC prediction due to its ability to quantify land use transition probabilities (Day et al., 2021). However, its primary limitation is its inability to incorporate spatial heterogeneity, making it less effective in indicating the direction of LULC changes (Wang et al., 2021). The integration of MC with CA improves spatial dynamics by considering neighborhood effects in land use transitions (Hamidi et al., 2022). Studies show that combining MC and CA can effectively simulate realistic patterns of urban expansion and deforestation (Zhao et al., 2021). Another successful hybrid approach involves combining Markov Chain analysis with machine learning techniques, such as Artificial Neural Networks (ANN) and Support Vector Machines (SVM), to complement the Markov model (Girma et al., 2022; Gharaibeh et al., 2020). This integration enhances the model's ability to capture complex relationships and non-linear patterns in land use change, leading to more accurate predictions of future scenarios (Wang et al., 2021). Logistic Regression (LR) is also commonly used in LULC modelling due to its simplicity and interpretability. When combined with CA and MC, LR adds probabilistic reasoning to LULC change predictions (Hashemzadeh et al., 2021). Despite its linear nature, LR as part of hybrid models can efficiently predict binary land use transitions, such as forest-to-urban conversions, with satisfactory accuracy (Wang et al., 2023).

This study seeks to develop predictive models capable of forecasting future land use scenarios in the Coronie district over the upcoming 20-year period. Such models not only offer insights into current trends but also provide a basis for assessing the potential impacts of alternative land management strategies. Taking into account the aforementioned, this study pursues a threefold objective: (1) to collect and process initial geospatial data on land use and land cover; (2) to evaluate the accuracy and reliability of hybrid predictive models based on joint application Markov chains with CA, MLP, SVM and LR in predicting future land use changes within Coronie district of Suriname; and (3) to develop a robust hybrid simulation model for predicting LULC change over the upcoming 10-year period, aiming to provide valuable insights for strategic planning and decision-making in the context both Coronie (locally) and Suriname's (nationally) sustainable development.

Methodology

Study area

The area of interest is Coronie, a district of Suriname covering a total area of 3902 km², situated in the northern part of the country. Geographically, Coronie is located to the north between 5.29° and 5.90° N and to the west between 55.87° and 56.60° W within the Young and Old Coastal Plains, ranging from 15 below to 43 m above mean sea level. The district is divided into three administrative districts, namely Welgelegen, Totness and Johanna Maria. Fig. 1 depicts the research area's location. The climate of the study area is tropical- equatorial (Af) according to the Köppen-Geiger climate classification. The soil cover of the study area is represented by Umbric Gleysols and Fibric Histosols according to the international soil classification system (WRB, 2014).

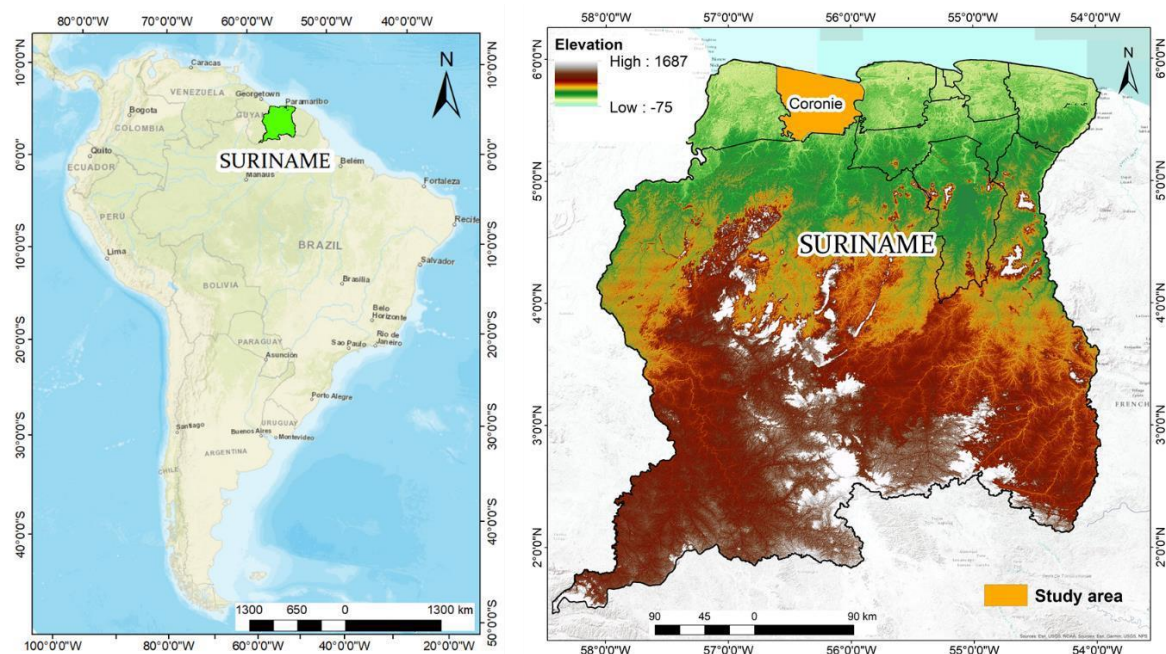


Figure 1: Location of the study area (developed by the authors)

Data collection

This study employed three remotely sensed satellite images to analyze LULC change dynamics and develop the predictive model (Table 1).

TABLE -1: Characteristics of Data Collected

Data	Source	Acquisition year	Scale/ Resolution
Multispectral satellite imagery	Esri Land Cover: https://livingatlas.arcgis.com/landcover/	2020	10 m
	Google Earth Engine Data Catalogue: https://developers.google.com/earth-engine/datasets/catalog	2016 2024	
Digital Elevation Model (DEM)	30-Meter SRTM Tile Downloader: https://dwtkns.com/srtm30m/	2018	1-arcsecond (3601x3601 pixels)

Note: Developed by T. van Ommeren-Myslyva

Slope, distance from water bodies, distance from roads, distance from deforestation areas, and distance from Totness airstrip datasets were developed individually in 2024 with a resolution of 10 m. These datasets underwent processing in QGIS 3.34 and ArcGIS 10.8 packages. The Euclidean distance function was employed to generate distance maps from roads, water bodies, deforestation areas, and airstrip using vector data of the features (Kafy et al., 2021; Gharaibeh et al., 2020).

Image classification

The bands 4–3–2 combination (true colour combination) and bands 8–4–3 combination (false colour combination) was utilized to perform Sentinel-2 image classification. A hybrid classification (unsupervised and supervised classification) approach was applied. Image pixel clustering (unsupervised classification) with similar spectral characteristics was performed using Iso Cluster Unsupervised Classification tools. This measure afforded to set the appropriate number of LULC classes for further detection. Based on our experience/knowledge of the area and Google Earth observation, the clusters were differentiated into seven thematic classes (Table 2).

The classified land use/land cover maps of 2016, 2020, and 2024 were generated using the supervised random forest classification. Image classification performance was evaluated using the accuracy assessment tools in the Segmentation and Classification toolbox of ArcGIS 10.8. Overall accuracy (OA), user accuracy (UA), producer accuracy (PA), and kappa coefficient (Kappa) were calculated. The overall accuracies and kappa coefficients for all the classified LULC maps of 2016, 2020, and 2024 were above 84% and 92%. This indicates a reliable and accurate classification of images for analyzing land use/land cover change.

Table-2: Major Land Use Land Cover Types Used and their Descriptions

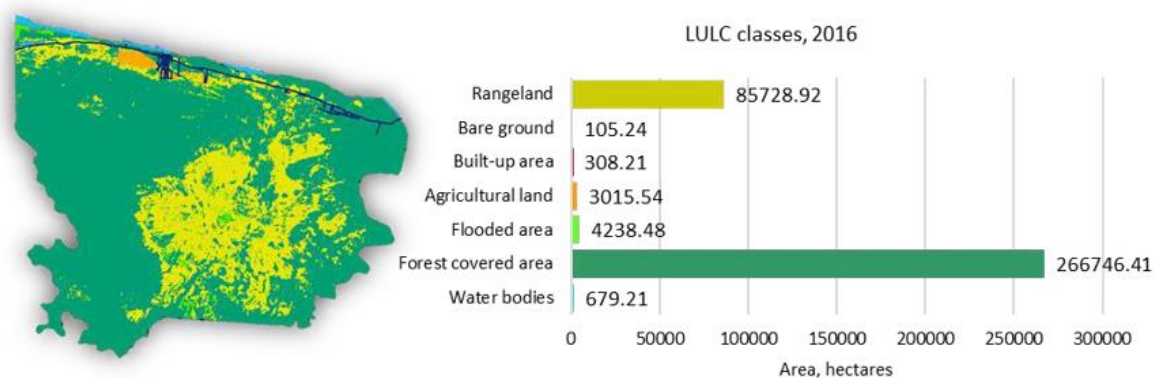
LULC class	Class description
Water bodies	Areas covered by rivers, streams, canals and reservoirs
Forest covered area	Landcover with primary trees, palm, and bamboo with a minimum crown tree cover of 30% with the potential to reach a canopy height of a minimum of 5 m and a minimum area of 1.0 hectares
Flooded area	Areas of any type of vegetation with obvious intermixing of water throughout a majority of the year; seasonally flooded area that is a mix of grass/shrub/trees/bare ground
Agricultural land	Includes areas used for perennial and annual crop production, irrigated areas, commercial farms
Bare ground	Includes land areas of exposed soil, bare soil, and open areas consisting of sand, rocks, and loam
Built-up area	Includes commercial areas, urban, residential, and rural settlements, industrial areas
Rangeland	Open areas covered in homogenous grasses with little to no taller vegetation; wild grasses with no obvious human plotting (i.e., not a plotted field)

Retrieved from <https://www.arcgis.com/>

Fig. 2 shows the spatial and statistical distribution of LULC classes for 2016, 2020, and 2024.

Driving variables

- Driving variables or driving factors or drivers, have a significant influence on the modelling of land use and land cover changes. These variables depict the different biophysical, socioeconomic, and infrastructural factors that impact how land is used and how it changes over time.
- Natural factors, known as biophysical drivers, play a significant role in shaping land use and land cover changes. These drivers include climate elements such as temperature, precipitation, and seasonal variations, which can affect farming practices, vegetation patterns, and the distribution of natural ecosystems. Topography also plays a role, with factors like slope, elevation, and aspects influencing the suitability of land for agriculture, construction, and other uses. Additionally, soil characteristics, including soil type, fertility, and drainage capacity, dictate the types of crops that can thrive and impact decisions regarding land use for agricultural or developmental purposes.
- Human factors, known as socioeconomic drivers, significantly influence LULC changes. These drivers encompass population trends, such as population growth, migration, and urbanization, which increase the demand for land to support housing, infrastructure, and public services.



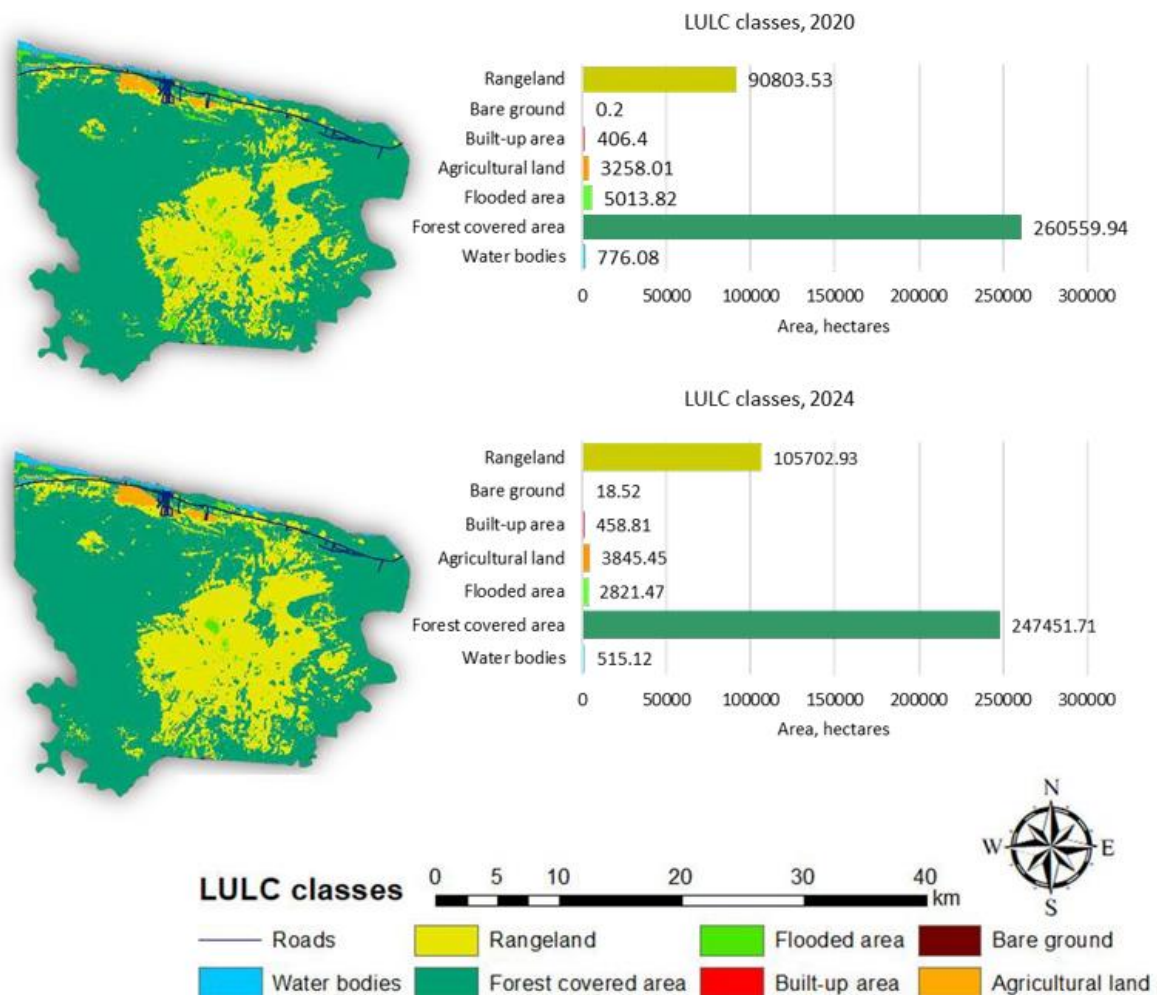


Figure 2: LULC maps of Coronie district for the years (a) 2016, (b) 2020, and (c) 2024 (developed by T. van Ommeren-Myslyva)

- Economic activities, including the expansion of agriculture, industrial development, and tourism, also contribute to land use changes as they respond to the need for economic growth. Additionally, government policies, zoning regulations, and conservation initiatives shape how land is utilized and affect patterns of land cover transformation.
- Infrastructural drivers refer to human-made structures and their effects on land use. These include proximity to transportation networks, as access to roads plays a role in the development of urban areas, agricultural zones, and industrial sites. The distance to markets and essential services like schools, hospitals, and other facilities also influences land use choices, with areas closer to these services being more attractive for residential or commercial development. Infrastructure expansion further affects how land is used and developed.
- The proximity to water bodies, including the distance from rivers and creeks, plays a key role in land use decisions. Locations near water sources are often preferred for agriculture, industry, and residential development because of the easy access to water resources.
- Environmental drivers, on the other hand, relate to ecological factors that impact land use. These include biodiversity and ecosystem services, where regions with high biodiversity or essential ecosystem functions may be prioritized for conservation, thereby influencing how the land is utilized.
- Recognizing the need to incorporate the potential influence of independent variables in simulating LULC changes (Gharaibeh et al., 2020), this study considered seven key driver variables. These variables include population, distances from water bodies, roads, airstrip and regions with deforestation, as well as terrain relief and slope represented by the digital elevation model (Fig. 3).

LULC change detection and simulation

The Land Change Modeler (LCM) in the TerrSet software was employed to detect and simulate future LULC changes within the study area. This stepwise, empirically driven process involves change analysis, transition potential modelling, and change prediction based on historical changes from 2016 to 2020. The Markov probability matrix was utilized to determine the likelihood of converting from one LULC class to another in the next period. Transition potentials, indicating the probability of land transitioning from one class to another, were assessed using a multi-layer perceptron neural network (MLP), support vector machine algorithm (SVM), and logistic regression (LR).

Finally, validation was conducted to compare actual and simulated land use/land cover maps of 2024, ensuring the reliability of different models in predicting future scenarios for 2034 and 2044 (Fig. 4).

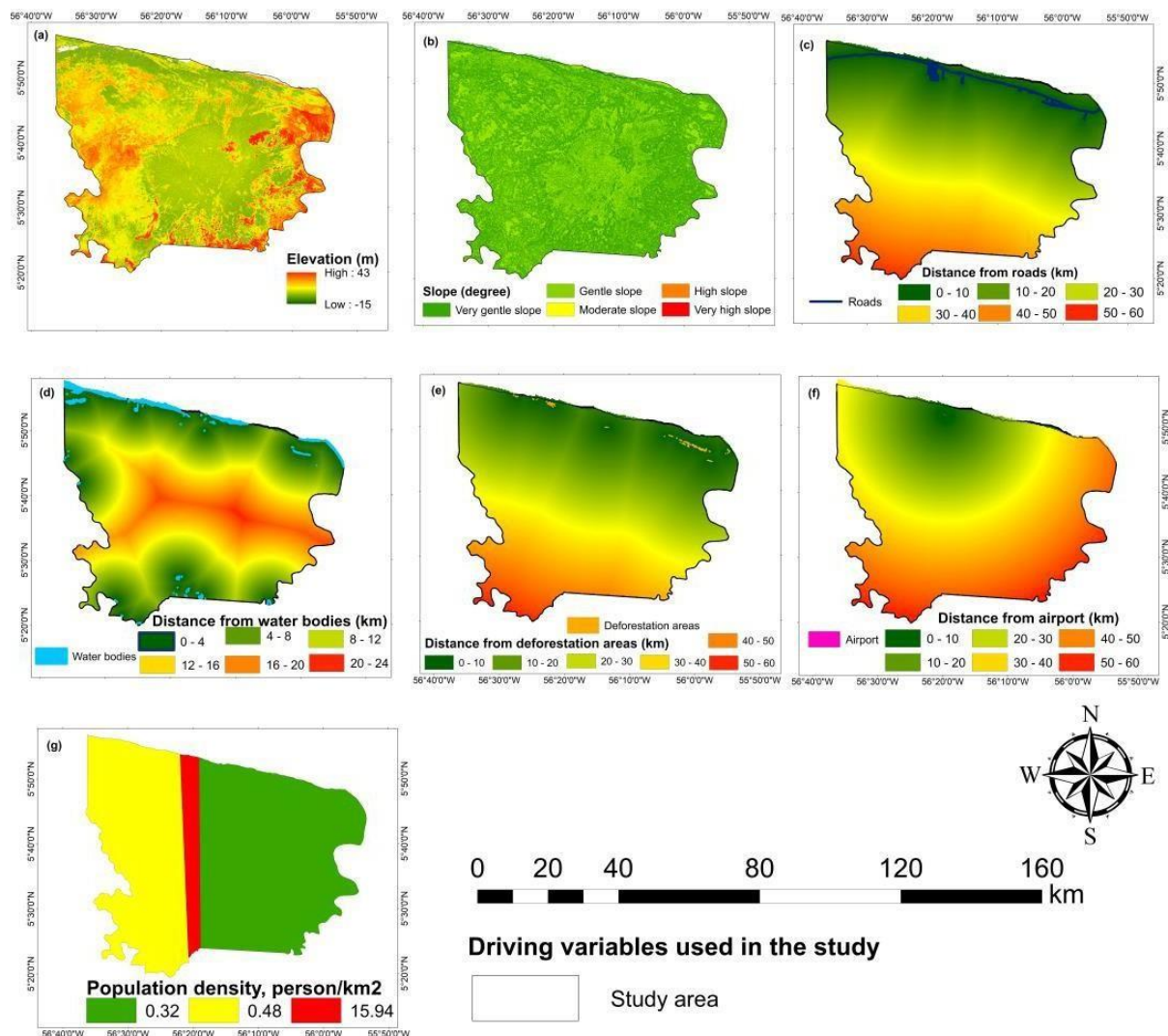


Figure 3: Driving variables used in the study: (a) elevation, (b) slope, (c) distance from main roads, (d) distance from water bodies, (e) distance from deforestation areas, (f) distance from airstrip, (g) population (developed by the authors)

Validation of the Model's Outputs

The validation process was conducted to assess the agreement and disagreement between the actual and simulated LULC maps of 2024, ensuring the reliability and acceptance of different hybrid model approaches in predicting

the future scenario in 2034 and 2044 (Kafy et al., 2021; Dey et al., 2021). Validation was carried out using the Validate module in TerrSet software. This module computed kappa index statistics using the hard prediction as a comparison map, including kappa for no information (Kno), kappa for grid cell level location (Klocation), kappa for stratum-level location (KlocationStrata), and kappa standard (Kstandard) (Girma et al., 2022; Mishra et al., 2018). A strong and acceptable Kappa value is typically associated with values around 80% and above (Girma et al., 2022; Gharaibeh et al., 2020). For future prediction, the images of 2016 and 2020 were taken as the dependent variable to simulate the LULC map of 2034 and 2044.

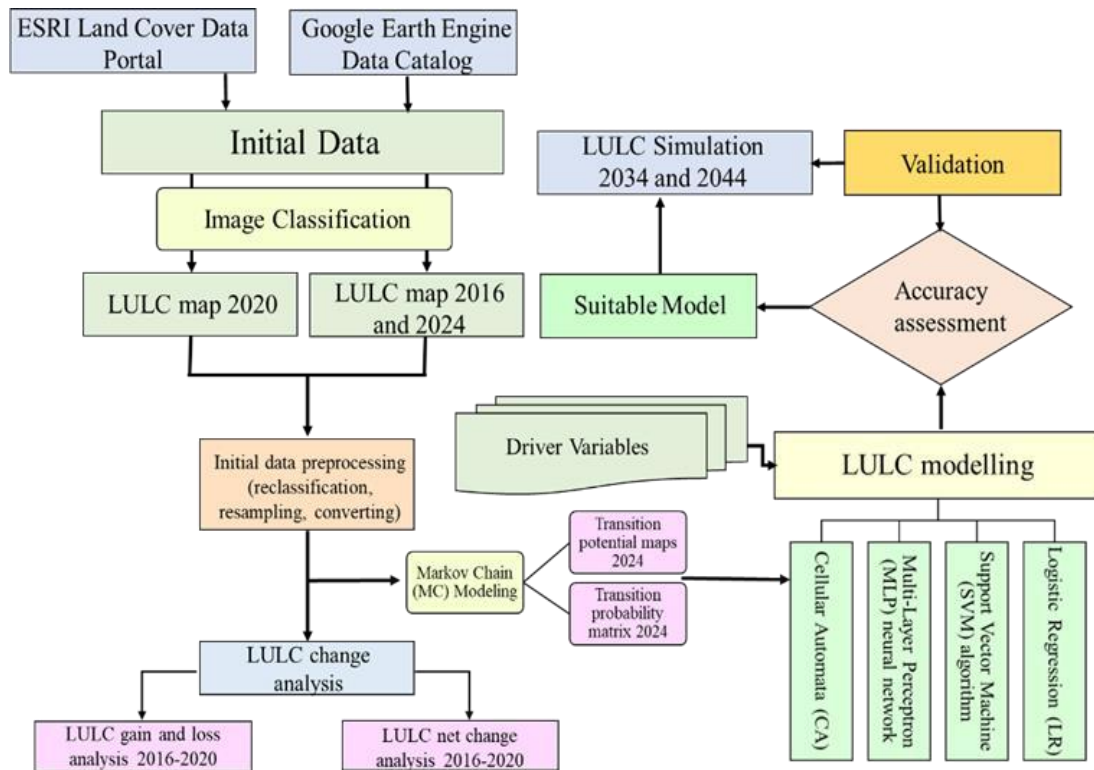


Figure 4: Research design flowchart (developed by T. van Ommeren-Myslyva)

Results and Discussions

For reliable forecasting of future trends in LULC change over the next two decades, detecting and understanding historical trends in land use and land cover dynamics is essential (Myslyva et al., 2024; Girma et al., 2022; Regasa et al., 2021). The study area experienced significant landscape transformations and various land use changes from 2016 to 2020, as depicted in Fig. 5.

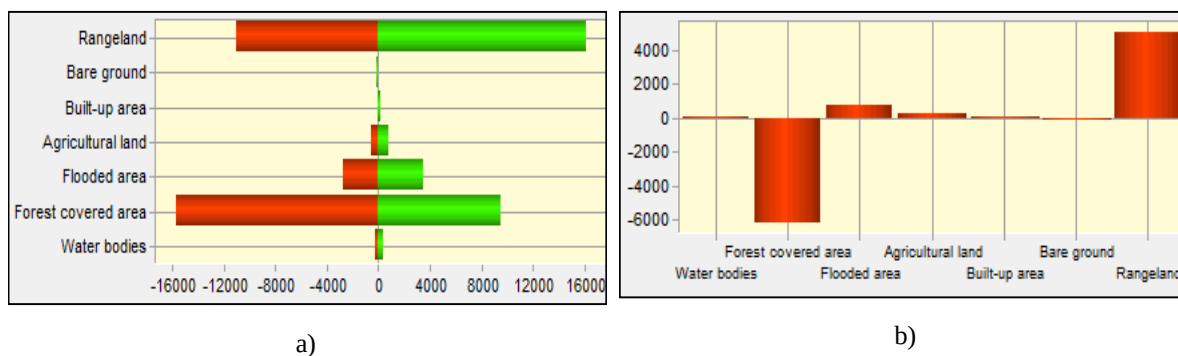


Figure 5: Gains and losses (a) and net change (b) in LULC within the limits of Coronie district between 2016 and 2020, hectares (developed by T. van Ommeren-Myslyva)

The data indicates a dynamic land-use environment, with large portions of the land remaining stable but also significant transitions between natural and human-modified landscapes. Urbanization and land management practices such as afforestation or deforestation appear to play a central role in shaping the future landscape. Additionally, water-related transitions suggest environmental factors like flooding are critical to understanding LULC changes in the study region.

The main contributions to the net changes in various land use and land cover categories are as follows (Fig. 6). The net change in water bodies is primarily influenced by changes in flooded areas.

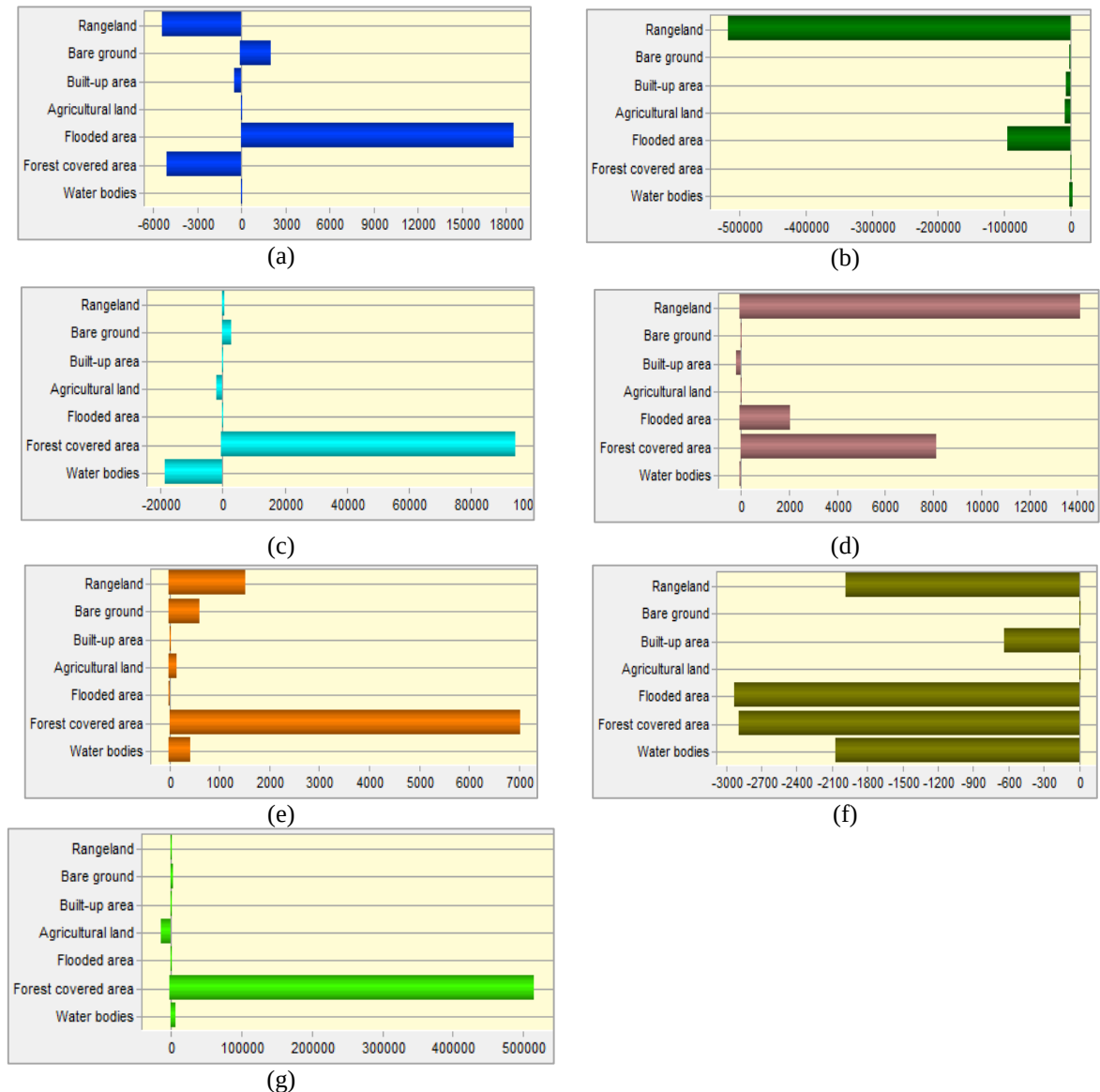


Figure 6: Contributions to the net change in different LULC classes within the limits of Coronie between 2016 and 2020, hectares (a – water bodies; b – forest cover; c – flooded area; d – agricultural land; e – built-up area; f – bare ground; g – rangeland) (developed by T. van Ommeren-Myslyva)

The net change in forest cover is significantly impacted by the conversion of rangeland. The net change in flooded areas is driven by both forest cover and water bodies dynamics. The expansion of agricultural land is largely due to the conversion of forest covered area and rangeland. The net increase in built-up areas is influenced by changes in forest cover, rangeland and bare ground. The net decrease in bare ground is largely attributed to increases in flooded areas, forest covered areas, rangelands, water bodies and built-up areas. The net decrease in rangeland is primarily driven by the expansion of forest cover.

Fig. 7 illustrates the combined LULC change map from 2016-2020 and Fig. 8 presents the gains and losses in different LULC classes during the 2016-2020 timeframe. The main trend observed during the period from 2016

to 2024 is the mutual transition between forest- covered areas (13,716.88 ha) and rangelands (8,548.97 ha), suggesting both natural forest regrowth and deforestation or land degradation in certain areas. This highlights the importance of incorporating the distance from deforested areas as a key driving variable in the LULC change predictive model.

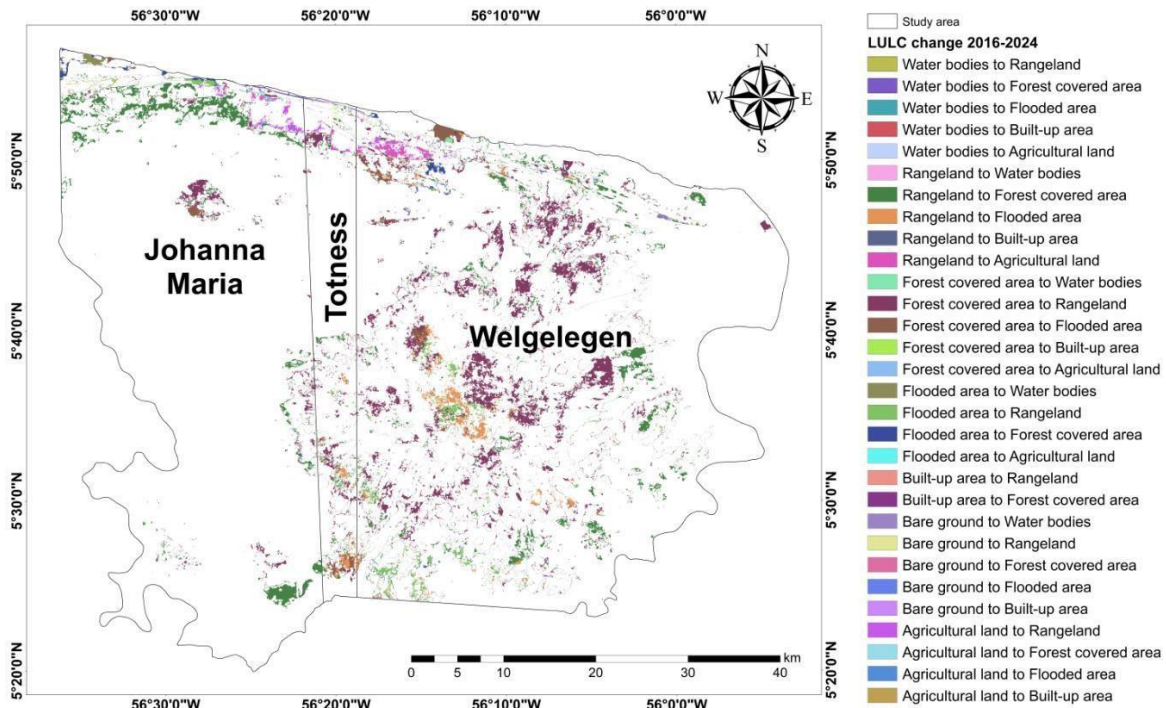


Figure 7: Combined LULC change map during the 2016-2024 timeframe (developed by T. van Ommeren-Myslyva)

Additionally, significant transitions are observed from forest-covered areas to flooded areas (1,647.55 ha) and from rangelands to flooded areas (1,787.56 ha), indicating water-related environmental changes, either seasonal or due to extreme weather events.

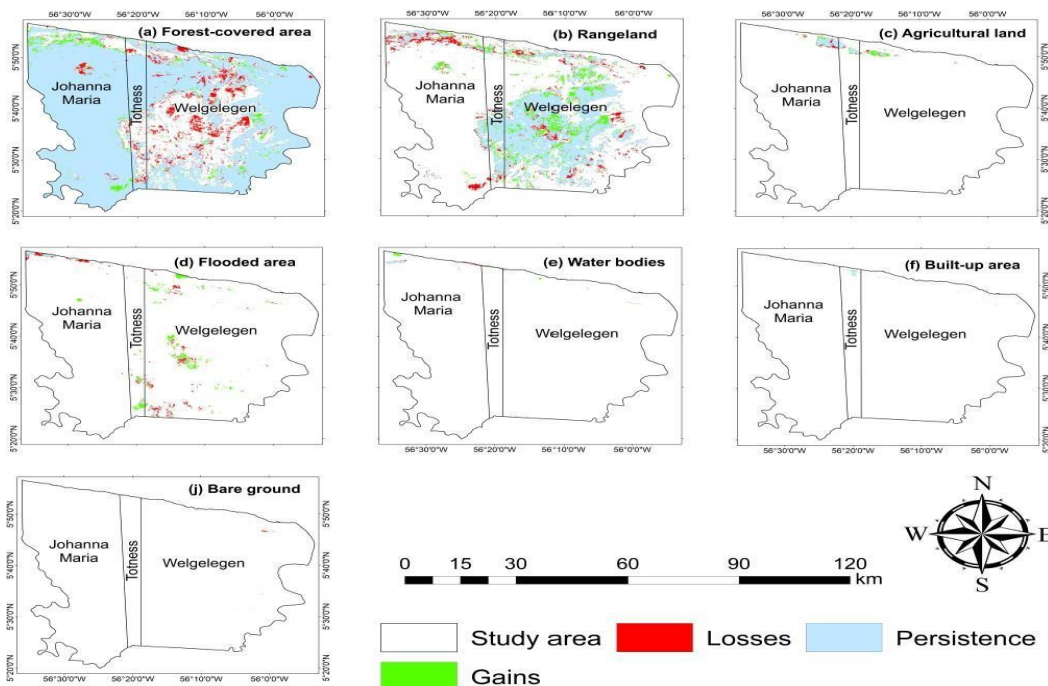


Figure 8: Gains and losses in different LULC classes during the 2016-2024 timeframe (developed by T. van Ommeren-Myslyva)

The conversion of 84.38 ha of forest into water bodies also suggests water expansion into forested areas, driven by flooding or water management issues. The main drains between the East-West Connection Road and the Atlantic Ocean are heavily silted and no longer function effectively, leading to increased water retention and flooding in the surrounding forest areas. This siltation, combined with poor maintenance and inadequate drainage infrastructure, exacerbates waterlogging and accelerates the conversion of forested land into water bodies. Furthermore, rising sea levels and increased rainfall intensity, driven by climate change, are likely contributing to the encroachment of water bodies into forested areas. These factors underscore the urgent need for improved water management practices. Consequently, the inclusion of the distance from water bodies as a driving variable in the LULC change predictive model is crucial. Agricultural land remains relatively stable (2,484.72 ha), but moderate transitions to rangeland (481.07 ha) and forest-covered areas (125.23 ha) suggest potential reforestation or land abandonment. Given this trend, agricultural land transitions could be selected as one of the sub-models for future LULC change prediction. The built-up area is expanding primarily through conversions from forest-covered areas (79.47 ha), rangelands (17.31 ha), and other categories, indicating urbanization or infrastructure development. This highlights the necessity of including the distance from roads and airstrip as the driving variables in the LULC change predictive model.

The results of the LULC change analysis form the basis for developing transition sub-models, the best of which will be incorporated into the final predictive model. These findings have identified four sub-transition models, focusing on the most significant gains and losses for each land use class (Table 3).

Table - III: Transition Sub-Models and their Descriptors

Transition sub-model	Description	Land cover transition	Explanation
Forest covered areas losses (FLO)	Forest-covered areas are converted to other land-use classes	Forest-covered areas to rangeland Forest-covered areas to flooded area Forest-covered areas to agricultural land Forest-covered areas to built-up area	This transition sub-models are strongly interlinked, with forests being the primary land type converted for agricultural use, underscoring deforestation as a key issue
Agricultural expansion (AEX)	Other land classes are converted to agricultural land	Forest-covered areas to agricultural land Flooded areas to agricultural land Rangeland to agricultural land	
Flooded areas transformation (FAT)	Other land classes are converted to flooded areas and flooded areas are converted to other land classes	Forest-covered areas to flooded areas Flooded areas to water bodies	This transition sub-model highlights the importance of water-related environmental changes, potentially driven by poor drainage or extreme weather events
Rangeland transformation (RAT)	Other land classes are converted to rangeland and rangeland are converted to other land classes	Forest-covered areas to rangeland Water bodies to rangeland	This transition sub-model reflects environmental degradation processes, where ecosystems are becoming less productive and more prone to desertification

Note: Developed by T. van Ommeren-Myslyva

The FLO sub-model captures the conversion of forest-covered areas to other land-use classes and highlights deforestation trends, driven by agriculture expansion, urbanization, and environmental factors like flooding. The choice of this transition sub-model is because significant loss of forest cover is critical to understanding land degradation, biodiversity loss, and climate change impacts. The AEX sub-model describes the expansion of agricultural land by converting other land-use types into farmland. Because agricultural expansion often occurs at the expense of natural ecosystems such as forests and rangelands, this may indicate growing pressures on land resources for food production, which could lead to habitat loss and reduced ecosystem services if not managed sustainably. The FAT sub-model represents the conversion of other land classes into flooded areas, as well as the conversion of flooded areas into other land classes and suggests changes in hydrological patterns, potentially

driven by rapid climate change, poor water management and seasonal fluctuations. Conversions from forest to flooded areas linked to deforestation, which reduces water retention, while flooded areas converting to water bodies represent permanent water expansion. The RAT sub-model tracks the conversion of other land-use types into rangeland and vice versa and reflects the degradation of forest and wetland ecosystems into more arid rangelands, due to deforestation, climate change or unsustainable water assets use.

The factors influencing land use changes are identified through spatial analysis and included in the model as static or dynamic components to enhance its precision (Leta et al., 2021). In this study, topographical and proximity driving variables were utilized to forecast LULC changes. Prior to incorporating these factors into the predictive model, the chosen variables underwent testing to determine their explanatory significance. The strength of the association was measured using Cramer's V, and p-values were employed to assess statistical significance (Table 4).

Table-IV: Cramer's V and P-Value for Each of the Explanatory Variables

Driver variables	Cramer's V	p-value
Elevation	0.4456	0.0000
Slope	0.2548	0.0000
Distance from water bodies	0.3945	0.0000
Distance from roads	0.3841	0.0000
Distance from airstrip	0.3721	0.0000
Distance from deforestation areas	0.3899	0.0000
Population density	0.5706	0.0000

Note: Developed by T. van Ommeren-Myslyva

According to Eastman (2016), Cramer's V values of 0.15 or higher are considered "useful," while values of 0.4 or higher are deemed "good" for prediction usage. All the driving variables included in the predictive models are considered useful for forecasting land classes transitions. All the variables are statistically significant predictors of LULC change (p-value = 0.0000), with population density and elevation showing the strongest associations, while slope has the weakest impact. This analysis highlights the importance of both human and natural factors in driving changes in land use and land cover within Coronie district.

To select the most appropriate transition sub-model, accuracy rates for each hybrid model with their corresponding transition sub-models, were calculated. For assessing the accuracy of the LR-MC hybrid model, the Relative Operating Characteristic (ROC) method was employed. This approach compares a suitability image, representing the likelihood of the class occurring (i.e., the input image), with a Boolean image, which shows the actual presence of the class (i.e., the reference image) (Eastman, 2016). The summarized results of the accuracy assessment for different sub-models are presented in Table 5.

Table-V: Hybrid Modelling Approaches and their Accuracy

Transition sub-model	Modelling approach accuracy rate (%)		
	MLP-MC	SVM-MC	LR-MC
FLO	83.98	86.57	87.67
AEX	80.28	98.70	88.35
FAT	85.39	94.76	87.03
RAT	87.72	93.43	88.60

Note: Developed by T. van Ommeren-Myslyva

The suitability of different transition sub-models was not assessed for the CA-MC predictive model, as this model used a transition areas file from a Markov Chain analysis (transitioning from all to all). However, due to the limited availability of historical data (considering the period from 2016 to 2020), this model was still selected for predicting LULC changes.

The acceptable range for model accuracy should be 80% or higher to validate the training results (Gharaibeh et al., 2020; Silva et al., 2020). Therefore, all hybrid models in this study are suitable for LULC change prediction. Accuracy rates for the MLP-MC and LR-MC models ranged from 80.28% to 85.39% and 87.03% to 88.60%, respectively, while SVM-MC showed superior performance, with values ranging from 86.57% to 98.70%. Notably, SVM-MC consistently outperformed both MLP-MC and LR-MC across all transition sub-models, especially for AEX and FAT transitions. Although previous studies (Girma et al., 2022; Leta et al., 2021; Gharaibeh et al., 2020) have documented higher accuracy rates for the multi-layer perceptron (MLP), the support

vector machine (SVM) demonstrated better predictive capabilities in the current study. The observed higher accuracy of SVM may be due to its robustness when working with smaller datasets (Myslyva et al., 2024), such as the limited five-year dataset used in this study.

Further, the MLP-MC and LR-MC hybrid models with the RAT transition sub-model, the SVM-MC hybrid model with the AEX transition sub-model, and the CA-MC hybrid model were selected to create simulated LULC maps for 2024. To validate the model's predictive accuracy, the Kappa statistic (k-index) for quantity and location was computed by comparing the hard simulation with the reference map for 2024. The statistics reveal that all Kappa index values surpass the satisfactory range ($\geq 80\%$) (Table 6).

Table-VI: The k-Index Values of the Simulated Lulc Map of 2024

Hybrid model	Index				Overall agreement, %
	Kno	Klocation	KlocationStrata	Kstandard	
CA-MC	0.9168	0.9382	0.9613	0.9613	94.59
MLP-MC	0.9307	0.9496	0.9669	0.9669	95.59
SVM-MC-	0.9378	0.9548	0.9827	0.9827	96.05
LR-MC	0.9366	0.9539	0.9815	0.9815	95.97

Note: Developed by T. van Ommeren-Myslyva

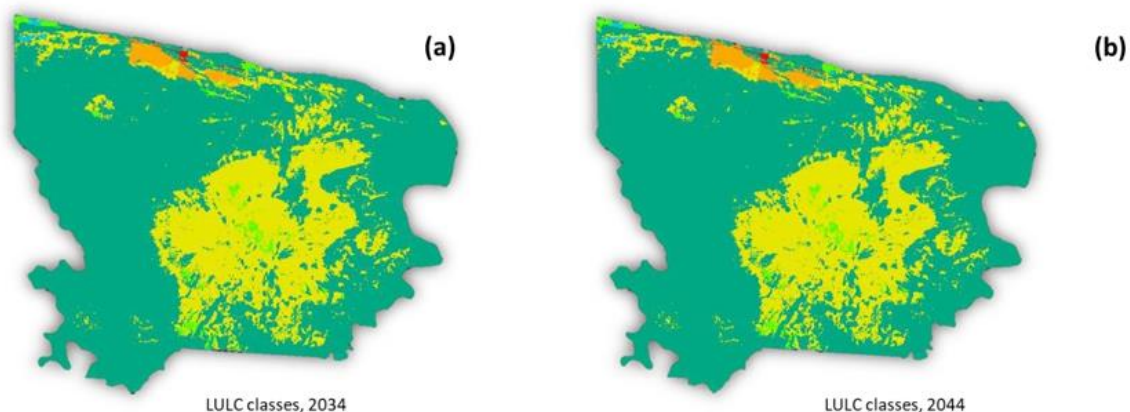
Despite the presence of quantity errors, the overall agreement between the actual and simulated maps is high, ranging from 94.59% to 96.05%. Clearly, in scenarios involving small datasets, the SVM-MC model proves more effective than the MLP-MC, LR-MC, or CA-MC hybrid models. This observation aligns with both our previous research on LULC change prediction in the Commewijne district, where SVM also demonstrated superior accuracy (van Ommeren-Myslyva et al., 2024), and with the results obtained by other authors (Liu & Li, 2021; Zhou & Liu, 2022). The model with the highest accuracy is detailed with parameters outlined in Table 7.

Table-VII: Predictive Hybrid Model Parameters and Accuracy

Parameter	Value
Modelling approach	SVM learning algorithm + Markov Chain analysis
Transition sub-model	Flood intensification
Kernel type	Radial Basis Function
Epsilon (ϵ)	0.0100
Class number	6
Total cross-validation number	282
Total sample number	7050
Overall cross-validation accuracy	0.9870
Overall out-of-sample accuracy	0.9864
Overall skill measure	0.9727

Note: Developed by T. van Ommeren-Myslyva

The developed model was then used to predict future land use and land cover changes for the years 2034 and 2044. Fig. 9 illustrates the LULC predictive maps for the years 2034 and 2044 and Table 8 depicts the area and net change of existing and predictive LULC classes.



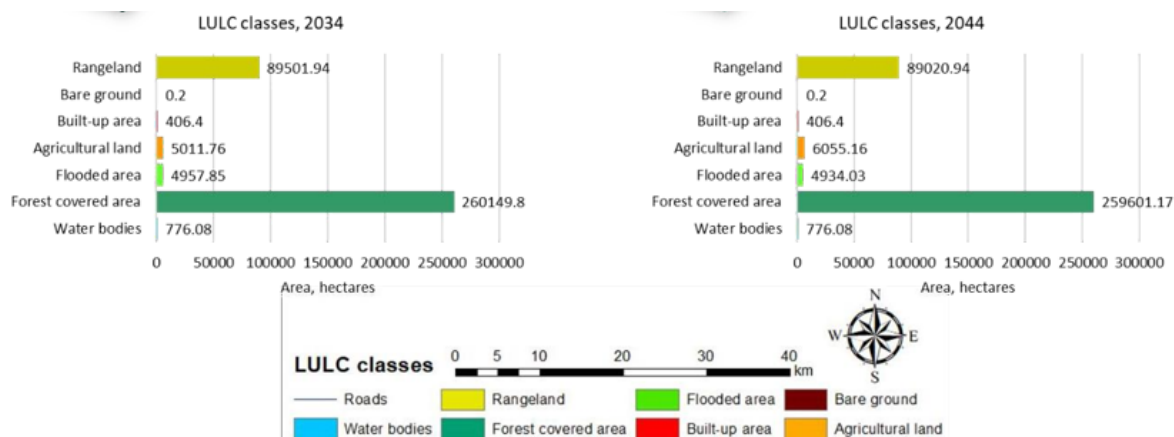


Figure 9 : Projected LULC maps for the territory of the Coronie district for 2034 (a) and 2044 (b) (developed by T. van Ommeren-Myslyva)

The projected LULC change dynamics for the periods 2024-2034, 2024-2044, and 2034- 2044 reveal significant trends in the Coronie district. Water bodies show no changes during the period 2034-2044, maintaining stability, although the prior decade (2024-2034) indicates a notable expansion of over 50%. Forest covered area shows a consistent decrease between 2034 and 2044, with a slight negative change (-0.21%). This contrasts the positive change observed between 2024-2034 and 2024-2044, suggesting deforestation pressures could ease by 2044. Flooded areas exhibit a minimal decline (-0.48%) during the 2034-2044 period, reversing the rapid expansion observed in previous decades (e.g., 75.73% in 2024- 2034). Agricultural land demonstrates a significant expansion, with an increase of 104.34 ha/year (20.8%) between 2034 and 2044, continuing the strong growth observed from 2024- 2044 (73.49%). This suggests that agricultural activities will expand at an accelerated rate.

Table-VIII: Area and Net Change of Existing and Predictive Lulc Classes

LULC Class	Time Period	Annual Change (ha/year)	Net Change (ha)	Percentage Change (%)
Water bodies	2024-2034	26.10	260.96	50.68
	2024-2044	13.05	260.96	50.68
	2034-2044	—	—	—
Forest covered area	2024-2034	1269.81	12698.09	5.13
	2024-2044	607.47	12149.49	4.91
	2034-2044	-548.63	-54.86	-0.21
Flooded area	2024-2034	213.64	2136.38	75.73
	2024-2044	105.63	2112.56	74.89
	2034-2044	-23.82	-2.38	-0.48
Agricultural land	2024-2034	116.63	1166.31	30.33
	2024-2044	110.48	2209.71	73.49
	2034-2044	1043.4	104.34	20.8
Built-up area	2024-2034	-5.24	-52.41	-11.42
	2024-2044	-2.62	-52.41	-11.42
	2034-2044	-	-	-
Bare ground	2024-2034	-1.83	-18.32	-98.92
	2024-2044	-0.92	-18.32	-98.92
	2034-2044	-	-	-
Rangeland	2024-2034	-1611.10	-16111.00	-15.24
	2024-2044	-841.10	-1682.00	-1.59
	2034-2044	-480.0	-48.0	-0.54

Note: Developed by T. van Ommeren-Myslyva

Built-up areas and bare ground remain unchanged during the 2034-2044 period. However, the negative trend seen in earlier periods (e.g., -11.42% for built-up areas between 2024 and 2034) highlights the possible contraction of urban areas. Rangeland consistently declines across all periods, with a reduction of 0.54% during the 2034-2044 period. This follows a more significant loss in the 2024-2034 period (-15.24%), suggesting a shift from extensive rangelands towards other land uses, possibly agriculture or forest regeneration. The changes in these LULC classes reflect evolving land use practices, particularly the expansion of agricultural land at the expense of forest cover and rangeland, while water bodies and urban areas remain relatively stable.

Considering that Coronie district faces a significant shortage of land resources suitable for building, infrastructure development, and agricultural activity, coupled with the continued use of the most productive land parcels for building construction, there is a pressing need to implement an urgent land management plan which will help mitigate the negative consequences of irrational land use during the last decades. The description of the identified trends in LULC change and the necessary activities for mitigating their negative impacts are outlined in Table 9.

Table-IX: Descriptions and Explanations for Observed Trends in Lulc Changes in Coronie District (2024–2044 Predictions)

LULC class	Trend	Trend explanation	Required land management activities
1	2	3	4
Water bodies	Continuous expansion is observed during the period from 2024 to 2034, with the rate of growth slowing in the following years	The increase in water bodies area demonstrates the impact of sea-level rise and coastal erosion impact. Natural processes like sediment deposition, tidal flooding, and water could also expand water bodies over time	Sustainable water management practices are essential for supporting mangrove and wetland ecosystems, as well as for the development and maintenance of water management infrastructure (e.g., drainage canals, levees)
Forest covered area	Forest area continues recovering, though the rate of increase slows slightly after 2034	The moderate growth in forest cover between 2024 and 2034 may be driven mostly by natural regeneration. However, this growth slows between 2034 and 2044, likely due to increasing land use pressures and agricultural expansion	Sustainable forestry management practices such as selective logging, reforestation, and community-based forest management are essential to balance conservation with economic activities. Agroforestry and sustainable harvesting of non-timber forest products can provide local communities with income while preserving forest ecosystems. Additionally, initiatives like carbon sequestration projects and maintaining riparian buffer zones help protect biodiversity and support long-term forest sustainability
Rangeland	Significant reduction in rangeland area, with a substantial decrease in the rate of loss	From 2024 to 2034, rangeland decreases significantly due to intensified land conversion for agriculture. Between 2024 and 2044, the rate of decline slows as the most accessible rangeland is already converted, and ongoing conservation efforts may mitigate further loss	Effective land use planning should be implemented to protect rangeland from conversion to agriculture or urban areas. Promoting sustainable agricultural practices and enhancing conservation efforts, such as establishing protected areas and supporting reforestation, will help preserve rangeland. Additionally, engaging local communities in conservation efforts will ensure sustainable land use and recovery of degraded areas.
Bare ground	Ongoing and rapid decline in bare ground, with a slight reduction in the rate of loss	The area of bare ground will decrease due to its transformation into other land use and land cover types	Monitoring and managing bare ground are essential for preventing soil degradation and maintaining ecosystem health

Table 9 Contd...

1	2	3	4
Flooded area	Flooded areas expand significantly from 2024 to 2034, then start to shrink slightly between 2034 and 2044	The significant expansion of flooded areas from 2024 to 2034 may be due to increased rainfall, rising sea levels, or changes in land use that enhance water accumulation. The slight shrinkage of flooded areas between 2034 and 2044 may result from natural variability in climate patterns and changes in regional weather conditions	To prevent the expansion of flooding, it is essential to develop and maintain efficient drainage systems and restore wetlands to enhance water absorption. Reforestation and improved land use planning, including floodplain management, can further mitigate flood risks by controlling runoff and preventing construction in high-risk areas. Additionally, implementing erosion control measures and increasing community education on flood risks will support long-term flood prevention and resilience
Agricultural land	Agricultural land show continuous expansion, though the rate of growth slows in later years (2034-2044)	The continuous expansion of agricultural land can be attributed to ongoing demand for food production and economic incentives for agricultural development. However, the slowing rate of growth in later years (2034-2044) may result from land constraints. Additionally, factors such as soil degradation and changing climate conditions might also impact the rate of agricultural expansion	To mitigate the negative impacts of agricultural land expansion, it is crucial to implement sustainable agricultural practices and land use planning that prevent encroachment into sensitive ecosystems. Integrating agroforestry and employing soil conservation techniques can help maintain soil health and biodiversity. Additionally, supporting sustainable agriculture through incentives and educating the community on best practices will promote long-term environmental sustainability
Built-up areas	Continued decline in built-up areas, with a slowing rate of decrease to 2044	The continued decline in built-up areas, with a slowing rate of decrease until 2044, can be attributed to factors such as limited urban development and possibly lower population growth or migration trends. However, with the planned reconstruction of an airstrip at Totness resort, which is likely to attract more residents and stimulate economic activity, the trend of decreasing built-up areas may change	To support optimal urbanization, it is crucial to implement integrated urban planning that balances growth with environmental sustainability, and invest in essential infrastructure. Involving local communities in the planning process and addressing potential challenges will ensure that urbanization is both resilient and aligned with local needs

Note: Developed by the authors

Effective management of water bodies requires sustainable water management practices, including drainage systems, levees, and support for mangrove and wetland ecosystems, to address rising sea levels and coastal erosion. For forest areas, sustainable forestry practices like selective logging, reforestation, and agroforestry balance conservation with economic needs, enhancing biodiversity and carbon sequestration while mitigating land use pressures.

To manage the expansion of flooded areas, developing efficient drainage systems, restoring wetlands, and improving land use planning are crucial to enhance water absorption and reduce flood risks. Implementing erosion control measures and community education on flood risks further supports flood prevention. In agricultural lands, adopting sustainable practices and land use planning helps prevent encroachment into sensitive ecosystems and maintains soil health. Integrated urban planning, including investment in infrastructure and community involvement, supports optimal urbanization and mitigates the decline in built-up areas. Monitoring and managing

bare ground are essential for preventing soil degradation, with a focus on transforming bare areas into productive land uses. Finally, effective land use planning and conservation efforts, including promoting sustainable practices and establishing protected areas, are necessary to preserve rangeland and mitigate further loss.

Conclusion

The transformation of land use and land cover (LULC) in the Coronie district of Suriname from 2024 to 2044 was simulated using various hybrid predictive models. This study employed a combination of dependent and independent spatial datasets, and TerrSet software was used for analyzing LULC changes through both statistical and graphical methods. Four hybrid predictive models were evaluated: Markov chain analysis with cellular automata (CA-MC), multilayer perceptron (MLP-MC), support vector machines (SVM-MC), and logistic regression (LR-MC).

Accuracy assessments indicated that the SVM-based model, which integrated the AEX transition sub-model for forest, flooded areas, and rangeland conversion to agricultural land, achieved an overall accuracy of 98.70%. Although MLP models showed higher accuracy in previous studies, the SVM model proved superior in this research due to its robustness with small datasets and ability to handle high-dimensional data effectively. The reliability of the SVM model was confirmed with Kappa statistics of 96.05% for predictions in 2024.

Forecasts for 2034 and 2044 predict increased agricultural land and reduced areas of bare ground, built-up areas, and rangeland. These trends emphasize the need for effective land and water resource management strategies to mitigate negative environmental impacts and balance ecosystem services. Given the unique characteristics of individual resorts in Coronie, future studies should develop more detailed predictive models incorporating specific driving variables relevant to each area.

References

- Abbas, H., Tao, W., Khan, G., Alrefaei, A. F., Iqbal, J., Albeshr, M. F., & Kulsoom, I., (2023).** Multilayer perceptron and Markov Chain analysis-based hybrid-approach for predicting land use land cover change dynamics with Sentinel-2 imagery, *Geocarto International*, 38(1).
- Abdullahi, S., & Pradhan, B., (2016).** Sustainable brownfields land use change modeling using GIS-based weights-of-evidence approach, *Applied Spatial Analysis and Policy*, 9(1). pp. 21–38.
- Adhikari, U., & Southworth, J., (2018).** Land use and land cover change modelling for sustainable development, *Sustainability*, 10(6). pp. 1838.
- Al-Hamdan, M. Z., Oduor, P., Flores, A. I., Kotikot, S. M., Mugo, R., Ababu, J., & Farah, H., (2017).** Evaluating land cover changes in Eastern and Southern Africa from 2000 to 2010 using validated Landsat and MODIS data, *International Journal of Applied Earth Observation and Geoinformation*, 62, pp. 8–26.
- Aloqaili, H., Alomar, S., Elgazzar, R., & Mahmoud, S., (2021).** Assessing land suitability and management strategies through LULC models, *Journal of Land Use Science*, 16(2). pp. 121–139.
- Asif, M., Kazmi, J., Tariq, A., Zhao, N., Guluzade, R., Soufan, W., Almutairi, Kh., El Sabagh, A., & Aslam, M., (2023).** Modelling of land use and land cover changes and prediction using CA-Markov and Random Forest, *Geocarto International*, 38(1).
- Belgiu, M., & Csillik, O., (2018).** Sentinel-2 imagery for land cover classification: A review, *International Journal of Applied Earth Observation and Geoinformation*, 70, pp. 1–14.
- Deng, X., Liu, H., Li, W., & Zhou, X., (2020).** The role of land use/land cover change in carbon sequestration, *Environmental Research Letters*, 15(6). p. 064010.
- Devi, A. R., & Shimrah, T., (2023).** Modelling LULC using Multi-Layer Perceptron Markov change (MLP-MC) and identifying local drivers of LULC in the hilly district of Manipur, India, *Environmental Science and Pollution Research International*, 30(26). pp. 68450–68466.
- Dey, N. N., Al Rakib, A., Al Kafy, A., & Raikwar, V., (2021).** Geospatial modelling of changes in land use/land cover dynamics using multi-layer perception Markov chain model in Rajshahi City, Bangladesh, *Environmental Challenges*, 4, p. 100148.
- Eastman, J. R., (2016).** *TerrSet Manual, Geospatial Monitoring and Modelling System*, Clark University, Worcester, USA.
- El Ghouli, I., Sellami, H., Khelifi, S., & Vanclooster, M., (2023).** Impact of land use land cover changes on flow uncertainty in Siliana watershed of north-western Tunisia, *Catena*, 220, pp. 106733.
- Gharaibeh, A., Shaamala, A., Obeidat, R., & Al-Kofahi, S., (2020).** Improving land-use change modelling by integrating ANN with cellular automata-Markov chain model, *Heliyon*, 6.
- Girma, R., Fürst, C., & Moges, A., (2022).** Land use land cover change modelling by integrating the artificial neural network with cellular automata-Markov chain model in Gidabo river basin, main Ethiopian rift, *Environmental Challenges*, 6, p. 100419.
- Guzder-Williams, B., Mackres, E., Angel, S., Blei, A. M., & Lamson-Hall, P., (2023).** Intra-urban land use maps for a global sample of cities from Sentinel-2 satellite imagery and computer vision, *Computers, Environment and Urban Systems*, 100, p. 101917.
- Hamidi, S., Jafari, R., & Nouri, Z., (2022).** Integration of Markov Chain and Cellular Automata to simulate urban growth: A case study of the Metropolitan City of Mashhad, Iran, *Remote Sensing*, 14(3). p. 762.
- Hashemzadeh, A., Mohammadi, M., & Malekinejad, N., (2021).** Application of hybrid logistic regression and cellular automata for modelling land use change: A case study of Tehran, Iran, *Sustainable Cities and Society*, 74, p. 103176.
- Hussain, S., Lu, L., Mubeen, M., Nasim, W., Karuppannan, S., Fahad, S., Tariq, A., Mousa, B. G., Mumtaz, F., & Aslam, M., (2022).** Spatiotemporal variation in land use land cover in the response to local climate change using multispectral remote sensing data, *Land*, 11(5). p. 595.

- Kafy, A.-A., Naim, M. D. N. H., Subramanyam, G., Faisal, A.-A., Ahmed, N. U., Al Rakib, A., Kona, M. A., & Sattar, G. S., (2021).** Cellular Automata approach in dynamic modelling of land cover changes using RapidEye images in Dhaka, Bangladesh, *Environmental Challenges*, 4, p. 100084.
- Kafy, R., Miah, M. D., Islam, M. N., & Rahman, M. M., (2020).** Impact of LULC changes on biodiversity conservation: A case study, *Journal of Environmental Management*, 273, p. 111118.
- Lambin, E. F., & Meyfroidt, P., (2019).** Global land use change, economic globalization, and the looming land scarcity, *Proceedings of the National Academy of Sciences*, 116(15). pp. 7350–7357.
- Leta, M. K., Demissie, T. A., & Tränckner, J., (2021).** Modelling and prediction of land use land cover change dynamics based on land change modeller (LCM) in Nashe watershed, upper Blue Nile basin, Ethiopia, *Sustainability*, 13.
- Liu, X., & Li, X., (2021).** Comparative analysis of SVM and MLP for land use classification using limited training samples, *Journal of Applied Remote Sensing*, 15(2). p. 026518.
- Luo, Y., Sun, J., Li, Z., & Hu, X., (2021).** Evaluating carbon sequestration potential in different land cover types, *Global Change Biology*, 27(8). pp. 1647–1660.
- McCarthy, M. J., Radabaugh, K. R., Moyer, R. P., & Muller-Karger, F. E., (2018).** Enabling efficient, large-scale high-spatial resolution wetland mapping using satellites, *Remote Sensing of Environment*, 208, pp. 189–201.
- Mishra, V. N., Rai, P. K., Prasad, R., Punia, M., & Nistor, M.-M., (2018).** Prediction of spatiotemporal land use/land cover dynamics in rapidly developing Varanasi district of Uttar Pradesh, India, using geospatial approach: A comparison of hybrid models, *Applied Geomatics*, 10(3). pp. 257–276.
- Mohamed, A., & Worku, H., (2020).** Simulating urban land use and cover dynamics using cellular automata and Markov chain approach in Addis Ababa and the surroundings, *Urban Climate*, 31, p. 100545.
- Muhammad, R., Zhang, W., Abbas, Z., Guo, F., & Gwiazdzinski, L., (2021).** Spatiotemporal change analysis and prediction of future land use and land cover changes using QGIS MOLUSCE plugin and remote sensing big data: A case study of Linyi, China, *Land*, 11(3). p. 419.
- Myslyva, T., Dasai, M., Huisden, C. M., Nadtochiy, P., & Bilyavskiy, Y., (2024).** Application of machine learning approaches for land use change modelling in Suriname, *Scientific Papers. Series E. Land Reclamation, Earth Observation and Surveying, Environmental Engineering*, XIII, pp. 830–840.
- Phiri, D., & Morgenroth, J., (2017).** Urban expansion and its effects on land cover and land use patterns, *Urban Ecosystems*, 20(1). pp. 101–118.
- Regasa, M. S., & Loiskandl, W., (2022).** Modelling land cover and climate change impacts on water resources using SWAT and future projections in Ethiopia's Rift Valley, *Environmental Research*, 214, p. 113900.
- Robinson, D.T., (2021).** Towards a spatially explicit agent-based model of land use change and ecosystem service provisioning in semi-arid rural regions. *Environmental Modelling and Software*, 139, p.104990.
- Roy, D.P., Wulder, M.A. and White, J.C., (2018).** Land cover classification with Landsat 8 OLI data. *Remote Sensing of Environment*, 210, pp.379–393.
- Sánchez-Espinosa, A. and Schröder, C., (2019).** Land use and land cover mapping in wetlands one step closer to the ground: Sentinel-2 versus Landsat 8. *Journal of Environmental Management*, 247, pp.484–498.
- Silva, L.P., Xavier, A.P.C., da Silva, R.M. and Santos, C.A.G., (2020).** Modelling land cover change based on an artificial neural network for a semiarid river basin in northeastern Brazil. *Global Ecology and Conservation*, 21.
- Song, C., Xu, B. and Caylor, K.K., (2020).** Impact of deforestation and urbanization on ecosystem services. *Ecosystem Services*, 42, 10114.
- Tehrany, M.S., Pradhan, B. and Jebur, M.N., (2020).** Spatiotemporal dynamics of land use/land cover and its effects on ecosystem services. *Ecological Indicators*, 117, 106643.
- van Ommeren-Myslyva, T., Wesenhagen, F., Kadirbaks, R. and Abdoelrahman, F., (2024).** Application of machine learning approaches for land use change modelling in Commewijne district of Suriname. *Science and Innovation*, 3, pp.13–29.

Wang, S.W., Munkhnasan, L. and Lee, W.-K., (2021). Land use and land cover change detection and prediction in Bhutan's high-altitude city of Thimphu, using cellular automata and Markov chain. *Environmental Challenges*, 2, 100017.

Wang, Y., Liu, D. and Zhang, X., (2023). An integrated Markov-Logistic Regression approach to LULC change prediction: A case study of the Yellow River Basin, China. *Environmental Science and Pollution Research*, 30(2). pp. 2611–2626.

Xie, Y., Zhang, L. and Chen, W., (2019). Predicting land cover changes and their impacts on the environment. *Journal of Environmental Management*, 245, pp.70–80.

Yeh, C.-K. and Liaw, S.-C., (2021). Applying spatial autocorrelation and logistic regression to analyze land cover change trajectory in a forested watershed. *Terrestrial, Atmospheric and Oceanic Sciences*, 32, pp.35– 52.

Zhao, X., Liu, Z. and Chen, Y., (2021). Markov-CA model for LULC change simulation in rapidly urbanizing regions: A case study in the Beijing-Tianjin-Hebei area. *Sustainability*, 13(19). p.10845.

Zhou, X. and Liu, L., (2022). Evaluating the performance of support vector machines and other classifiers for land cover classification with small sample sizes. *Journal of Photogrammetry and Remote Sensing*, 181, pp.174–189.

Decoding Factors Influencing Third-Party Payment App growth in India.

Mr. Shankar Singh Bhakuni

Associate Professor, BBD University, Lucknow, India.

Abstract

The lifestyle and transaction patterns of customers are frequently altered by new technology. Apps for third-party payments have just become popular as a new way to exchange money online. It gives customers a simpler, quicker, safer, free, and more enjoyable experience. Customers frequently use these applications for wealth management, insurance premium payments, bill payment, cell recharging, hotel and trip booking, and QR code scanning, among other services, which makes them more helpful than simple money transaction apps. Numerous third-party payment apps, such as PhonePe, Google Pay, Paytm, BHIM, and others, provide their users free services in India. This study examines consumer loyalty in third-party payment applications by looking at behavioral, cognitive, and attitudinal elements. Because there are many apps accessible in the market, customers are loyal to a particular app and consistently use it for payments and money transactions. It investigates how perceived security and utility affect customer happiness and trust, forming commitment and loyalty. This study uses expected confirmation theory to create a novel framework that establishes different interactions between variables. In addition to the existing Expectation-Confirmation Model (ECM) elements, additional open-innovation-related constructs served as the foundation for the development of the conceptual model. Convenience sampling was used to gather data from 490 samples in Uttar Pradesh via an online Google Form questionnaire. Multiple linear regression and structural equation modeling using Smart PLS software were utilized in quantitative research. The data was analyzed using the structural equation modeling method based on PLS. The results show that greater customer happiness and trust with perceived usability and security support customer trust in third-party payment apps. When clients have faith in the service provider, their behavior and frequent usage demonstrate their loyalty and dedication. Offering insightful practical information, the study emphasizes factors such as perceived security, utility, customer pleasure, customer confidence (trust), and commitment as critical markers of loyalty to third-party payment apps.

Keywords – Customer Loyalty, Trust and Commitment, Third Party Payment Apps, Use Continuity, Uttar Pradesh.

Introduction

The effects of modern technology on human life are numerous. It simplifies life. It improves people's lives in terms of lifestyle, health, entertainment, communication, and financial security. The smartphone is one of the most important consumer products ever created in the new digital era (Aydin & Burnaz, 2016). Smartphone users have steadily grew in the last few years as a result of the increased mobility of modern life, causing a sharp increase in the mobile phone market (Anser et al., 2021, Schierz et al., 2010). Mr. Narendra Modi, India's Prime Minister, has given a significant boost to the country's digital payments sector, making it possible for it to execute cashless transactions. According to a Google-BCG report, by 2022, it is anticipated that India's digital payment sector will increase by \$500 billion. Along with apps from the commercial sector like Paytm, Mobikwik, and Freecharge, the Indian government is promoting a number of digital payment apps, such as the Aadhaar Payment app and the Bharat Interface for Money (BHIM) app. These modern apps make it easier to send money across the many regions of our country. As per the trends & estimates for the financial year 2021, in India 35 billion digital transactions which have a net value of 60 trillion INR would be conducted. The transaction value was projected to exceed 385 trillion Indian rupees in the Indian fiscal year 2026 (India: value of digital transactions 2026 | Statista). In June 2021, India's unified payments interface service providers reported 2.8 billion digital payment transactions worth more than five trillion Indian rupees (India: value of digital transactions 2026 | Statista).

Graph1(Digital transactions value for the year 2020 and 2021, until 2026(in trillion Indian rupees) (India: value of digital transactions 2026 | Statista)) Mobile payment service is a new payment system tool that allows for electronic money transfers via mobile applications (Popovska-Kamnar, 2014 Customers who use third-party payment methods are considered no-cost buyers therefore not treated as future prospects (Garcia-Acebron et al., 2010; Wang, 2010). People are more likely to stick with a single app when switching is expensive or there are no good alternatives, according to research (Garcia-Acebron et al., 2010).

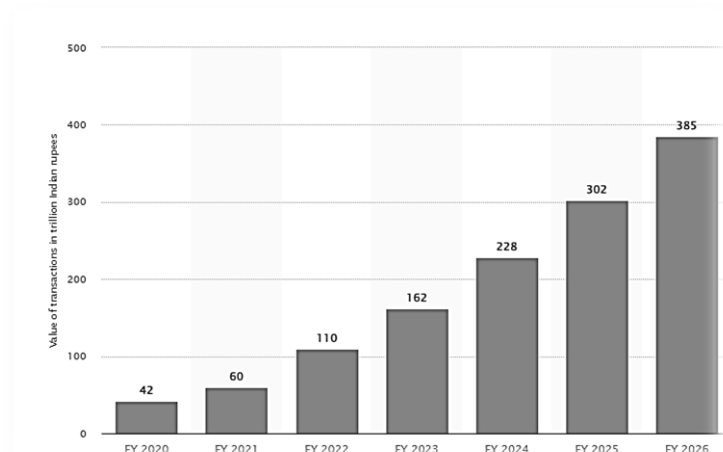


Table-I: Users details (Source: NPCI)

Table-I lists the top 10 third-party applications used in India along with their market value and the number of users that regularly conduct mobile payments using these apps.

S No	UPI Application Name	Volume (Mn)	Value (Cr)
1	PhonePe	2,077.60	394,565.58
2	Google Pay	1,587.43	302,989.79
3	Paytm Payments Bank App	706.37	88,094.49
4	Cred	10.36	13,817.16
5	ICICI Bank Apps	31.99	8,921.76
6	BHIM	27.12	8,831.67
7	Amazon Pay	76.18	6,641.62
8	Airtel Payments Bank Apps	15.12	5,732.09
9	Yes Bank Apps	25.14	5,689.75
10	State Bank of India Apps	3.63	1,961.72

Literature review

Mobile devices, such as smart phones, tablets, and wearables, are used to make mobile payments for goods, services, and bills over wireless networks or other communication technologies. The retail and online shopping industries are dominated by mobile payment, a service provided by third-party payment systems (3PPs) such as BHIM, PhonePe, Google Pay, Amazon Pay, Paytm, and others. Customers can use the service to pay for services and goods quickly and easily using their mobile phones by scanning their own Quick Response (QR) codes or displaying them for merchants to scan. Customers are increasingly using mobile devices to pay for goods and services during everyday activities such as grocery shopping and dining out. Bhattacharjee's (2001) expectation-confirmation theory, based on Oliver's (1980) expectation-confirmation theory, connects the phases before and after acceptance (post-acceptance/post-adoption). To comprehend behaviours following the use of an information system, Bhattacharjee (2001) introduced the Expectation Confirmation Model (ECM). This model may be able to predict whether or not a user will continue to use the service by using predictors such as satisfaction, confirmation, and perceived utility (Bhattacharjee and Anol, 2001).

“REAL” customer loyalty

There have been several methods used to study customer loyalty, but two are critical. The first method is based on consumer behavioural outcomes and is concerned with recurring purchase or behaviour intention. This methodology is used to build client loyalty programs in a variety of industries. Some third-party payment apps, for example, reward customer loyalty and encourage repeat business by providing discounts or freebies after a certain number of transactions. Clearly, the goal of these initiatives is to encourage only behavioural loyalty.

Customer satisfaction with the transaction and other facility of third party apps

Satisfaction is a psychological reaction that follows a cognitive evaluation of the good or service received and the cost of acquisition. It is consistent, cumulative, and based on the customer's general impression of the consumption, but it is also transactional (Boulding et al., 2005).

The Expectation-Confirmation Model in Information System Adoption

According to Bhattacharjee (2001), the users continuation decision is same to the repurchase decision of consumers because of three decisions: (1) Influenced by an initial acceptance or purchase decision; (2) Influenced by an initial product or information system use experience; and (3) have the potential to result in an ex-post reversal of the initial decision. By merging the ECT and TAM model, he established the Expectation-Confirmation Model (ECM) (Figure 1).

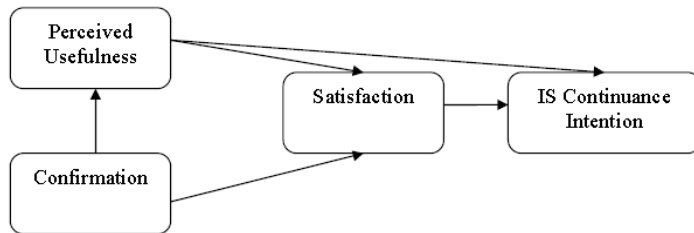


Fig 1: Expectation-Confirmation Model

Source (Anderson & Sullivan, 1993; Dabholkar, Shepherd & Thorpe, 2000)

Hypothesis:

Customers who are satisfied with both term usefulness and security on a regular basis are more committed to Third Party Payment App and continue to use that App for regular transactions, becoming true loyal customers. In this explanation chain study, all associations are presumptively both substantial and favourable. In addition, the commitment-loyalty relationship is anticipated to be the most powerful. Thereby the following hypotheses are

H1: Perceived usefulness and security of third party payment app have positive impact on customer commitment.

H2: Satisfied Customer commitment is positively relate to behaviour loyalty.

H3: Satisfied Customer commitment is positively relate to cognitive loyalty.

H4: Satisfied Customer commitment is positively relate to attitudinal loyalty.

Methodology

Research Type

To investigate the relationship between variables, this paper employs a conclusive research design (descriptive). The research employs a quantitative approach, with statistics used for analysis. The quantitative data will be used to determine the relationship between independent or exogenous variables (for example, perceived usefulness, perceived security, confirmation, satisfaction, and so on) and the endogenous or dependent variable (e.g. Satisfaction, Trust, commitment, behaviour Loyalty, Attitudinal Loyalty and Cognitive loyalty etc.). In this study, Trust serves as a mediator for trust in terms of commitment and different types of loyalty.

Instrument Development

To collect data for testing the research model, an empirical study involving an online questionnaire was conducted. The questionnaire started with questions about the demographics of the participants (age, gender), experience, satisfaction, trust, and loyalty to and use of mobile third-party payment services. A five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used to assess perceived security (PS), confirmation (CON), and commitment (COM), Satisfaction (SAT), Trust (TRU), and perceived usefulness (PU) of participants. Furthermore, because participants may use multiple third-party payment Apps, they were required to real time transaction pertaining to satisfaction (SAT), commitment (COM), perceived security (PS), perceived usefulness (PU), and different types of loyalty (Behaviour Loyalty (BL), Cognitive Loyalty (CL), and Attitudinal Loyalty (AL), which concerned the most commonly used platform.

Data Collection Method

The data were collected via an online questionnaire through the Google form. Random sampling was used to distribute the questionnaire. The questionnaire is divided into two sections:

First section questions to ensure that each respondent's demographic and characteristics match the research criteria, such as confirmation that the respondent uses a third-party payment app; how many apps he has installed on his phone, and so on.

Loyalty is a third-order factor that is composed of three factor: behavioural, cognitive, and affective. Each variable is assessed with five items and a five-point Likert scale. Customer satisfaction is a second-order factor that is generated from satisfactions related to consumption and satisfactions related to transactions.

Sample

Consumers of third-party payment apps come from a wide range of socioeconomic classes, ethnic origins, age groups, degrees of education, and income ranges. The data for the paper was gathered using a convenience sample of 490 participants. The respondents are from various cities in Uttar Pradesh. Demographic information for the participants is Split into the following: 62 % of the participants were between the ages of 21 and 40; 41 % were males and 58 % were females; 55% were married and 45% were single, divorced, or widowed; and 96.3% used at least one third-party payment app such as phone pe, Bhim, Paytm, etc.

Table-II: Outer loading Analysis (source: developed by the researcher through Smart PLS software)

		AL	BL	CL	COM	CONF	PS	PU	SAT	TRU
Attitudinal	AL2	0.941								
Loyalty	AL4	0.963								
Behavior	BL1		0.823							
Loyalty	BL2		0.766							
	BL4		0.819							
Cognitive	CL1			0.807						
Loyalty	CL2			0.753						
	CL3			0.725						
	CL4			0.787						
Commitment	CO1				0.794					
	CO2				0.817					
	CO3				0.818					
	CO4				0.744					
	CO5				0.818					
Confirmation	CONF1					0.854				
	CONF2					0.869				
	CONF3					0.823				
Perceived	PS1						0.833			
Security	PS2						0.743			
	PS3						0.838			
Perceived	PU1							0.841		
Use	PU2							0.838		
	PU3							0.856		
	PU4							0.879		
Satisfaction	SAT2								0.715	
	SAT4								0.769	
	SAT5								0.718	
	SAT6								0.816	
	SAT7								0.8	
	SAT8								0.755	
Trust	T2									0.886
	T3									0.881
	T4									0.857

Table-III: Reliability and Validity Assessment (source: developed by the researcher through Smart PLS software)

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Attitudinal Loyalty(AL)	0.897	0.931	0.95	0.906
Behavior Loyalty(BL)	0.726	0.734	0.845	0.645
Cognitive Loyalty(CL)	0.771	0.782	0.852	0.591
Commitment(COM)	0.858	0.861	0.898	0.638
Confirmation(CONF)	0.807	0.813	0.886	0.721
Perceived Security(PS)	0.729	0.741	0.847	0.649
Perceived Use(PU)	0.876	0.878	0.915	0.729
Satisfaction(SAT)	0.857	0.865	0.893	0.582
Trust(TRU)	0.847	0.848	0.907	0.765

Table 3 define the Cronbach's alpha reliability test was used to assess the dependability of the questionnaire's likert scale questions (Cronbach, 1951). Following the exploratory factor analysis, the alpha coefficient was calculated for each factor identified. The alpha value for each factor ranged from 0.726 to 0.897 (see table3); the coefficient alpha should be greater than 0.7, indicating that the measurement is adequate (Nunnally, 1978). All of the questions are relevant to the study

Discriminant Validity

Testing for validity concentrates on every variable with a single dimension. Convergent validity testing, namely the Average variance extracted (AVE) value for each participant, was used in this investigation. If the AVE value is equal to or greater than 0.5, the indicator is valid. Discriminant validity is a construct validity test that involves estimating the indicator's size from each block (Hair, 2019).

Table-IV: Discriminant validity (source: developed by the researcher through Smart PLS software)

	AL	BL	CL	COM	CONF	PS	PU	SAT	TRU
Attitudinal Loyalty (AL)	0.952								
Behavior Loyalty (BL)	0.56	0.803							
Cognitive Loyalty (CL)	0.598	0.753	0.769						
Commitment (COM)	0.673	0.753	0.707	0.799					
Confirmation (CONF)	0.518	0.683	0.771	0.743	0.849				
Perceived Security (PS)	0.57	0.634	0.747	0.752	0.774	0.806			
Perceived Use (PU)	0.506	0.693	0.744	0.753	0.709	0.78	0.854		
Satisfaction (SAT)	0.436	0.462	0.55	0.606	0.669	0.708	0.68	0.763	
Trust (TRU)	0.566	0.615	0.661	0.722	0.71	0.734	0.762	0.636	0.875

According to Table 4, each statement indicator appears to have the maximum loading factor value among the examined latent constructs, suggesting that each latent construct can accurately predict each statement indicator, supporting the validity of discriminant validity.

Value of R Square

A measure of how much of the variation in the value of the affected variable can be accounted for by the variable influencing it is called R square (R^2). The adjusted R square (adjusted R^2) is employed if a study has more than two independent variables. The value R^2 of adjusted is always less than the value of r square. With the limiting criteria divided into three classifications, the R^2 value is close to one. If $R^2 = 0.67$, the model is substance (strong), If R^2 is 0.33, the model is moderate (medium), and if R^2 is 0.19, the model is weak (Hair J. F. et. al., 2017)

Table 5: R- square values ((source: developed by the researcher through Smart PLS software)

	R-square	R-square adjusted
Attitudinal Loyalty (AL)	0.497	0.490
Behavior Loyalty (BL)	0.560	0.562
Cognitive Loyalty (CL)	0.500	0.495

Commitment (COM)	0.532	0.530
Trust (TRU)	0.607	0.595
Perceived Security (PS)	0.554	0.550
Perceived Use (PU)	0.410	0.408
Satisfaction (SAT)	0.468	0.460

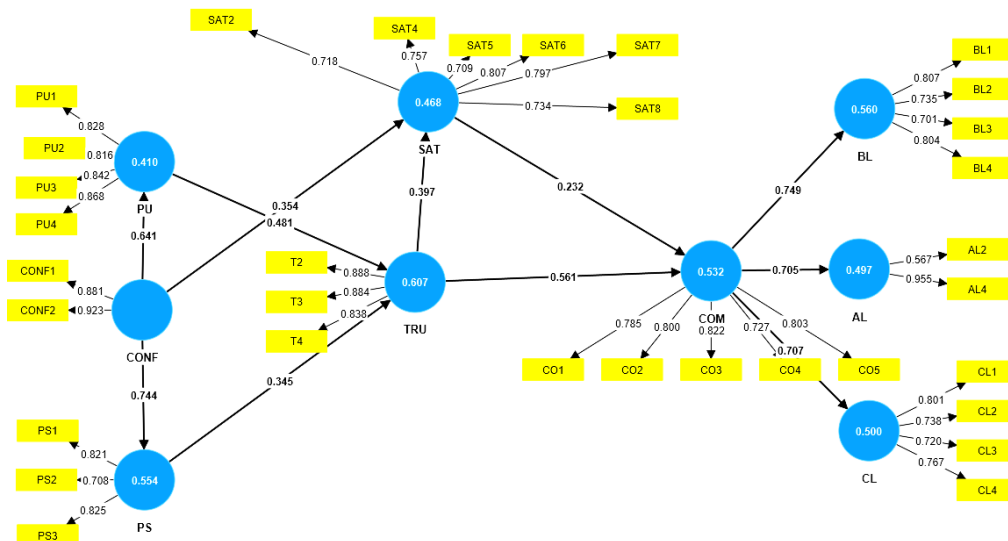


Fig 2: R^2 model (source: developed by the researcher through Smart PLS software)

According to the table, the R Square of behavioral loyalty, affective loyalty, and cognitive loyalty values are 0.447, 0.562, and 0.495, or 44.7%, 56.2%, and 49.5%, respectively, indicating that the Commitment influences all Loyalty variables. Another factor, commitment value, is 65.8%, which defines the influence of perceived usefulness, perceived security, and trust regarding Third party payment App.

Testing hypotheses

A hypothesis test can be performed after a diagrammatic model is thought to be fit, according to Hair et al. (2019). The bootstrapping method is used on the sample in this case. The goal of bootstrapping is to reduce the problem of research data.

Table-VI: Result analysis (source: developed by the researcher through Smart PLS software)

Hypothesis		Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ((O/STD EV))	P values	Result
H1	PS → COM	0.335	0.331	0.094	3.559	0.00	Significant
	PU → COM	0.307	0.304	0.119	2.583	0.01	Significant
H3	SAT → TRU → COM → CL	0.109	0.113	0.054	2.039	0.041	Significant
H4	SAT → TRU → COM → AL	0.104	0.108	0.052	1.988	0.047	Significant
H2	SAT → TRU → COM → BL	0.116	0.121	0.057	2.039	0.041	Significant

In this section, the direct effect table 6 depicts a significant relationship between commitment and various types of loyalty, such as attitudinal, cognitive, and behavioral loyalty. However, table 6 does not define a significant relationship between all variables such as confirmation, satisfaction, trust, and commitment and loyalty. H1, H2, H3, and H4: Customers who are satisfied with both term usefulness and security on a regular basis are more committed to Third Party Payment App and continue to use that App for regular transactions, becoming true loyal. In this table 6, we can see that customers who perceived the usefulness and security of a third-party payment app

on a transaction used it on a regular basis. We can also see that customer loyalty has a significant relationship with all factors satisfaction, trust, and commitment.

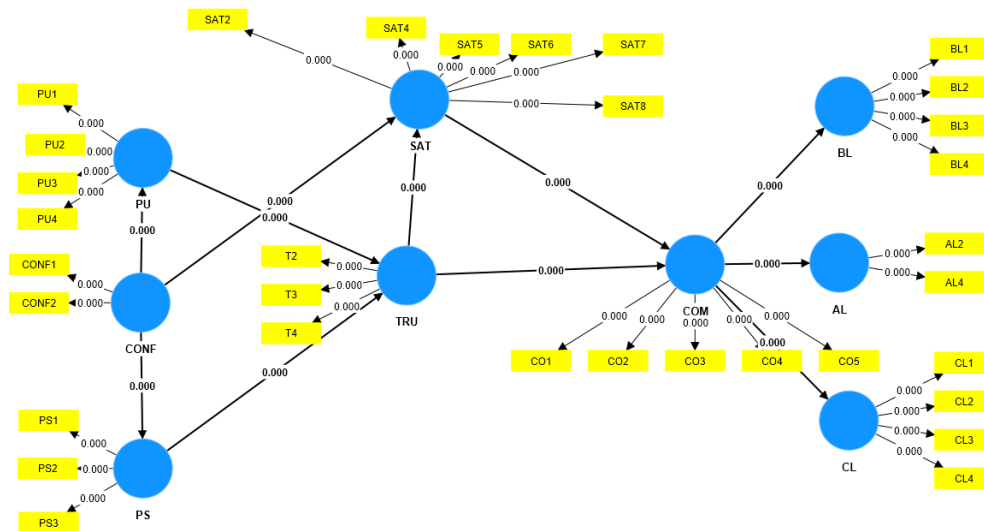


Fig 3: P value base model (source: developed by the researcher through Smart PLS software)

Table-VII: Model fit table (source: developed by the researcher through Smart PLS software)

Parameter	Fit recommendation	Estimated model achieved
SRMR	<0.080	0.59
NFI	>0.90	0.912
RMS Theta	<0.12	0.09

This table 7 provide the statistical measurement for the model fit with the mathematical representation of the research is SRMR value which is 0.59, with NFI value 0.912, which justify the above given model a good fit. (Pineda et al., 2021)

Conclusion

The goal of this study was to find out how Third Party Payment App change the scenario of payment in India and users who have multiple Apps for payment and that user become loyal for particular one App. Past researches has generally concluded that App users do not become loyal user because these all third-party Apps provide the same facilities and offerings. In order to define the study's objective, a conceptual framework that (1) It is explained how "true" client loyalty differs from "spurious" loyalty. (2) Satisfaction is assessed by perceived use, advantages of third-party apps, and transaction security. (3) Relational drivers (trust and commitment) in addition to transactional drivers (satisfaction) are used to justify consumer loyalty. The explanatory effects are seeded sequentially from satisfaction to trust, commitment, and eventually to various forms of client loyalty in our explanation chain. The findings offer a convincing explanation for how third-party payment users gained commitment and show that satisfaction, trust, and commitment, in that sequence, are appropriate precursors to consumer loyalty. These customers do not become loyal customers solely based on satisfaction or product satisfaction. Instead, they require a connection strategy before they can develop into devoted clients. As mediating factors in the relationship between satisfaction and loyalty, confidence as well as commitment are necessary. Contrary to earlier study that claimed that customer loyalty and happiness are directly correlated (Pan et. al., 2012), this paper shows that trust and commitment are more important than satisfaction alone. This study supports the framework by demonstrating that "true" loyalty & satisfaction are multidimensional factors. The analysis shows that there are three unique components of consumer loyalty: behavioral, cognitive, and affective, which correspond to conceptual suggestions for "true" loyalty (Oliver, 1999). The consumption of products and transactional processes that place an emphasis on service (quick, convenient, and secure) are similar to how satisfaction has two dimensions. The latter component supports the broader business strategy used by third-party payment apps, which is to prioritize usability, security, and response time over service quality (Boulding et al., 2005). In conclusion, the greater the customer satisfaction with third-party payment Apps in terms of regular usefulness and security, the more likely the customer will develop trust in those Apps. Customers who have faith in the service provider are more likely to continue the habit and behavior. Long-term customer loyalty will result from commitment. On the other hand, if a Third Party Payment Apps increases customer loyalty from regular

users in maximum offering, coupons, and discount environments, such as other Apps providers, it must improve in order for customers to feel confident and committed, both of which are important to create "true" customers.

Limitations of the study

Despite the extensive research and analysis conducted for this study, its results are restricted to the Third Party Payment Service App business and the sample's population. Other service sectors, such as ground transport, amusement parks, supermarkets, and fast food restaurants, where switching barriers are thought to be smaller, require additional research into the loyalty-commitment-trust-satisfaction explanation chain.

References

Anser, M.K. et al. (2021). "Toward the e-loyalty of digital library users: investigating the role of e-service quality and e-trust in digital economy," Library hi tech, ahead-of-print (ahead-of-print). Available at: <https://doi.org/10.1108/lht-07-2020-0165>.

Aydın, İ. et al. (2024). "Consumers' foresight for the digital Turkish lira: an empirical study," Journal of financial services marketing, 29(2), pp. 214–228. Available at: <https://doi.org/10.1057/s41264-022-00201-9>.

Bhattacharjee, A. (2001). "An empirical analysis of the antecedents of electronic commerce service continuance," Decision support systems, 32(2), pp. 201–214. Available at: [https://doi.org/10.1016/s0167-9236\(01\)00111-7](https://doi.org/10.1016/s0167-9236(01)00111-7).

Boulding, W. et al. (2005). "A Customer Relationship Management roadmap: What is known, potential pitfalls, and where to go," Journal of marketing, 69(4), pp. 155–166. Available at: <https://doi.org/10.1509/jmkg.2005.69.4.155>.

Bravo, M., Vasquez-Parraga, A. and Zamora-González, J. (2005). "Loyalty in the air: Real and fictitious factors the loyalty formation of airline travelers," Stud. Perspect. Tourism, 14(2), pp. 101–106.

Briefing, I. (2017). Growth of digital payment systems in India, India Briefing News. Available at: <http://www.india-briefing.com/news/growth-of-digital-paymentssystems-inindia-14797.html> (Accessed: October 5, 2024).

Callarisa Fiol, L.J. et al. (2009). "Customer loyalty in clusters: Perceived value and satisfaction as antecedents," Journal of business-to-business marketing, 16(3), pp. 276–316. Available at: <https://doi.org/10.1080/10517120802496878>.

Day, E. and Crask, M.R. (2000). "Value assessment: the antecedent of customer satisfaction," The Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior, 13, pp. 52–60.

Dick, S.A. and Basu, K. (1994). "Customer loyalty: toward an integrated conceptual framework," J.Acad. Marketing Sci, 22(2), pp. 99–113.

Gremler, D.D. and Brown, S.W. (1998). "Worth beyond revenue: The full value of a loyal customer," pp. 119–128.

Gustin, C. and Singh, J. (2005). "Curvi linear effects of consumer loyalty determinants in relational exchanges," J. Marketing Res, 42(1), pp. 96–108.

Hair, J.F. et al. (2017). Advanced Issues in Partial Least Squares Structural Equation Modeling (PLS-SEM). Sage. Loyalty in the air: Real and fictitious factors the loyalty formation of airline travelers (no date).

Lu, H.-P. and Yu-Jen Su, P. (2009). "Factors affecting purchase intention on mobile shopping web sites," Internet research, 19(4), pp. 442–458. Available at: <https://doi.org/10.1108/10662240910981399>.

Ly, H., Yu, G. and Wu, G. (2018). "Relationships among customer loyalty, customer satisfaction, corporate image and behavioural intention on social media for a corporation," International Journal of Information Technology and Management, 17(3), p. 170. Available at: <https://doi.org/10.1504/ijitm.2018.092879>.

Ma, K.X. et al. (2021). “Fresh food online shopping repurchase intention: the role of post-purchase customer experience and corporate image,” *International journal of retail & distribution management*, ahead-of-print(ahead-of-print). Available at: <https://doi.org/10.1108/ijrdm-04-2021-0184>.

Macintosh, G. and Lockshin, L.S. (1997). “Retail relationships and store loyalty: A multi-level perspective,” *International journal of research in marketing*, 14(5), pp. 487–497. Available at: [https://doi.org/10.1016/s0167-8116\(97\)00030-x](https://doi.org/10.1016/s0167-8116(97)00030-x).

Morosan, C. and DeFranco, A. (2016). “It’s about time: Revisiting UTAUT2 to examine consumers’ intentions to use NFC mobile payments in hotels,” *International journal of hospitality management*, 53, pp. 17–29. Available at: <https://doi.org/10.1016/j.ijhm.2015.11.003>.

Namkung, Y. and Jang, S. (2007). “Does food quality really matter in restaurants? Its impact on customer satisfaction and behavioral intentions,” *Journal of hospitality & tourism research*, 31(3), pp. 387–409. Available at: <https://doi.org/10.1177/1096348007299924>.

Oliveira, T. et al. (2016). “Mobile payment: Understanding the determinants of customer adoption and intention to recommend the technology,” *Computers in human behavior*, 61, pp. 404–414. Available at: <https://doi.org/10.1016/j.chb.2016.03.030>.

Phonthanukitithaworn, C., Sellitto, C. and Fong, M.W.L. (2016). “An investigation of mobile payment (m-payment) services in Thailand,” *Asia-Pacific journal of business administration*, 8(1), pp. 37–54. Available at: <https://doi.org/10.1108/apjba-10-2014-0119>.

Purwanto, A., Asbari, M. and Santoso, T.I. (2021). “Education management research data analysis: Comparison of results between Lisrel, Tetrad, GSCA, Amos, SmartPLS, WarpPLS, and SPSS for small samples,” *Nidhomul Haq Jurnal Manajemen Pendidikan Islam*, 6(2), pp. 382–399. Available at: <https://doi.org/10.31538/ndh.v6i2.1575> ith, P. in C. (no date) The use of electronic money and its impact on monetary policy, Econstor.eu. Available at: <https://www.econstor.eu/bitstream/10419/147460/1/86795244X.pdf> (Accessed: October 5, 2024).

Empowering Women through AI: A Comparative Study of SHG and Micro Finance Institutions Frameworks in Rayagada, Odisha

Mr. Karteek Madapana

Research Scholar, School of Management
Studies, GIET UNIVERSITY, Gunupur,
Odisha, India

Dr. N.V. J. Rao

Professor, School of Management Studies,
GIET UNIVERSITY, Gunupur, Odisha,
India

Abstract

This research employs advanced artificial intelligence (AI) techniques to assess the impact and effectiveness of Self-Help Groups (SHGs) and Microfinance Institutions (MFIs) on women's empowerment in the Rayagada district of Odisha. By integrating AI-driven predictive analytics, the study provides a detailed quantitative and qualitative analysis of how these financial frameworks influence social security and women's empowerment. The analysis unveils significant insights into the operational success and potential areas for improvement of these initiatives. Key findings from the AI models highlight an enhanced capacity to predict financial behaviors and outcomes, thus offering a comprehensive evaluation of the socio-economic benefits of SHGs and MFIs for women in the region.

The AI models demonstrated varying levels of accuracy across different expenditure types, with accuracies ranging from 80.56% for agriculture equipment to 97.22% for house making. This high accuracy underscores the effectiveness of the predictive models in identifying successful financial behaviors among participants. Additionally, the classification reports and confusion matrices for each expenditure type provide a deeper understanding of the predictive performance and reveal areas where the models perform exceptionally well and where further improvements are necessary.

Visualizations such as accuracy and loss curves further support the robustness of the AI models, showcasing their learning efficacy and convergence over training iterations. These results collectively highlight the potential of AI in transforming the traditional evaluation methods of microfinance initiatives, offering a data-driven approach to enhancing women's empowerment and socio-economic development.

Keywords – Women's Empowerment, Microfinance, Self-Help Groups, Artificial Intelligence, Socio-Economic Impact, Predictive Analytics, Sustainable Development

Introduction

Microfinance has emerged as a powerful tool for uplifting economically disadvantaged populations by providing access to essential financial services. This access facilitates self-employment opportunities, which are crucial for fostering sustainable community development. The purpose of this study is to thoroughly examine the operational effectiveness and socio-economic impact of two prominent microfinance models—Self-Help Groups (SHGs) and Microfinance Institutions (MFIs)—in the Rayagada district of Odisha. By leveraging advanced analytical techniques, particularly artificial intelligence, this study aims to offer a deeper understanding of how these financial models influence the socioeconomic status and empowerment of women in the region. Microfinance initiatives are pivotal in enhancing the socio-economic parameters of impoverished communities. They provide critical financial resources that enable individuals, especially women, to start and sustain small businesses. Beyond financial support, microfinance programs foster empowerment, enhancing self-confidence and societal status among participants. These programs have the potential to drive significant improvements in income levels, health, education, and overall quality of life. Despite the numerous benefits, the effectiveness of microfinance programs often faces several challenges. Key issues include fund mismanagement, where misallocation or ineffective use of funds can undermine the goals of microfinance initiatives, reducing their impact; limited reach, where microfinance programs sometimes fail to reach the most marginalized and remote populations, limiting their overall effectiveness; and inadequate monitoring, where lack of proper oversight and monitoring can lead to operational inefficiencies and a failure to address the evolving needs of beneficiaries. The integration of artificial intelligence (AI) into microfinance offers innovative solutions to these challenges. AI can enhance the precision and efficiency of microfinance programs through predictive analytics, allowing for better-targeted interventions and resource allocation; improved monitoring, providing real-time insights and more effective monitoring of microfinance activities, ensuring funds are used appropriately; and enhanced reach, helping identify and reach underserved populations, ensuring broader and more equitable access to financial services. By addressing these challenges, AI-enhanced microfinance models have the potential to significantly improve the effectiveness and impact of financial inclusion programs, driving substantial socio-economic improvements for women in disadvantaged regions. This study aims to explore these potential benefits, offering data-driven insights into the transformative power of integrating AI with traditional microfinance approaches.

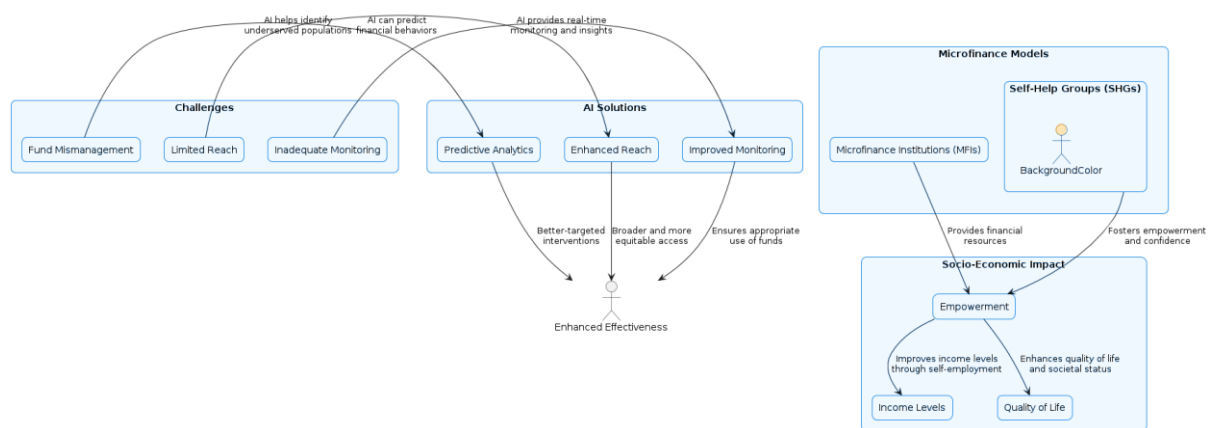


Figure 1. Proposed Research work

Literature Review

Recent advancements in Artificial Intelligence (AI) have significantly influenced the microfinance sector, improving its efficiency and reach. Chikwira et al. (2022) highlighted the positive correlation between microfinance and poverty reduction, as well as the growth of small enterprises. In 2023, researchers demonstrated how AI can enhance loan disbursement processes and customize financial products to better meet individual needs, thus boosting financial inclusion and borrower satisfaction (Chatterjee et al., 2023). AI-driven tools have also improved risk assessment, allowing Microfinance Institutions (MFIs) to better predict and manage default risks. Furthermore, AI has facilitated real-time tracking and reporting of financial transactions, which reduces fund mismanagement and enhances overall governance (Bruckner, 2024). Advanced machine learning models applied in 2024 have shown exceptional accuracy in predicting household poverty levels, thereby enabling more targeted interventions and optimized resource allocation (Alatas et al., 2024). However, the necessity of developing ethical AI frameworks to address data privacy, algorithmic bias, and the digital divide has been emphasized in recent literature (Johnson et al., 2024).

Historically, microfinance has been seen as a powerful tool for alleviating poverty and empowering women. Kabeer (2001) observed that access to microfinance enables women to engage more actively in economic activities, which enhances their decision-making power within their households and communities. Pitt et al. (2006) found that participation in microfinance programs is linked to improvements in women's income, education, and health outcomes. Self-help groups (SHGs) and MFIs are the primary models used to promote women's empowerment. SHGs build solidarity and mutual support among women, while MFIs provide essential capital and financial literacy training (NABARD, 2008; Banerjee et al., 2015). Despite these benefits, challenges such as fund mismanagement, limited reach, and inadequate monitoring remain. Predictive analytics, a subset of AI, offers innovative solutions to these challenges by enhancing precision, efficiency, and monitoring capabilities (McKinsey Global Institute, 2018). Recent studies continue to explore these solutions, highlighting AI's potential to address persistent issues and significantly improve the effectiveness of financial inclusion programs (Chatterjee et al., 2023; Johnson et al., 2024). These advancements underscore the importance of leveraging advanced technologies to enhance the operational success and socio-economic impact of microfinance initiatives, especially in disadvantaged regions.

Study Area Profile: Rayagada District

Rayagada district, located in the Indian state of Odisha, is notable for its rich cultural diversity and predominantly tribal population. Established as a separate district on October 2, 1992, Rayagada is bordered by several other districts, including Kalahandi, Nabarangpur, Koraput, and Gajapati. The district's demographic profile includes a significant tribal community, which makes up around 57% of the total population. The major tribes, such as the Kondhas, Souras, and Jatapus, are known for their distinct cultural practices, languages, and traditions. These communities primarily engage in agriculture and forest-based livelihoods, relying on subsistence farming, minor forest produce collection, and traditional crafts. Socio-economically, Rayagada is characterized by low literacy rates, high poverty levels, and limited access to basic amenities like healthcare, education, and infrastructure. Despite these challenges, the district has shown progress due to targeted interventions by the government and non-governmental organizations. Initiatives like Mission Shakti have been pivotal in promoting women's self-help groups (SHGs), and empowering women through microfinance and entrepreneurial activities. Agriculture remains the primary economic activity, with key crops including paddy, millet, maize, and pulses. The district's rich mineral resources, particularly bauxite, also contribute to the local economy. Additionally, the forest cover provides opportunities for collecting non-timber forest products (NTFPs) like honey, tamarind, and sal seeds, crucial to the tribal livelihoods. However, Rayagada faces significant challenges, including geographical isolation,

inadequate infrastructure, and socioeconomic disparities, which make the tribal population particularly vulnerable. These factors highlight the importance of microfinance interventions aimed at poverty alleviation and economic empowerment. The district's diverse socio-cultural fabric and economic potential offer a unique opportunity to study the impacts of microfinance models like SHGs and MFIs. By leveraging these financial frameworks, significant improvements can be made in the socio-economic conditions of the tribal population. Studying Rayagada provides valuable insights into the effectiveness of microfinance in a region marked by both rich cultural heritage and substantial developmental challenges. The outcomes from Rayagada can serve as a model for similar regions, demonstrating the potential of microfinance to foster sustainable development and empowerment in marginalized communities.

Research Methodology

Data Collection

The research employed a comprehensive approach to data collection, integrating both quantitative and qualitative methods to ensure a thorough analysis of the impact of microfinance on women's empowerment in Rayagada district. Data was gathered through structured surveys and focus group discussions with participants of Self-Help Groups (SHGs) and Microfinance Institutions (MFIs). The surveys collected detailed demographic information, financial data, and responses on various socio-economic indicators, while the focus groups provided deeper insights into the experiences and challenges faced by the participants. This mixed-method approach ensured a well-rounded understanding of the microfinance landscape in the region.

AI-Enhanced Analysis

To deepen the analytical insights of the study, artificial intelligence was employed, specifically using a Gradient Boosting Classifier, a robust machine learning model known for its high accuracy and capability to handle complex datasets. The AI model was designed to predict financial behaviors and outcomes and identify key factors influencing the success rates of microfinance initiatives.

Data Pre-processing

Before the data was fed into the AI model, it underwent several pre-processing steps to ensure quality and consistency:

- **Data Cleaning:** This step involved appropriately handling missing values and removing any irrelevant data points to maintain the integrity of the dataset.
- **Encoding:** Categorical variables, such as SHG type and expenditure categories, were transformed into a numerical format using one-hot encoding. This conversion allows the model to process these categorical variables effectively.
- **Normalization:** Numerical features were scaled to ensure they were on a similar scale, which is crucial for improving the model's performance and ensuring that no single feature dominates the learning process.

Model Training and Evaluation

The Gradient Boosting Classifier was selected due to its capability to create an ensemble of weak prediction models, typically decision trees, and combine them to form a robust predictive model. The following steps were involved in the training and evaluation process of the model:

- **Feature Selection:** Independent variables (features) included demographic information, participation details, and financial indicators. The dependent variables (targets) were various expenditure types and financial behaviors.
- **Training and Testing Split:** The dataset was divided into training and testing sets using a 70-30 split. This approach ensures that the model is trained on a substantial portion of the data while preserving a separate set for unbiased evaluation.
- **Model Parameters:** The model was configured with 300 estimators, a learning rate of 0.05, and a maximum depth of 5. These parameters were chosen to balance the model's complexity and its ability to generalize well on unseen data.
- **Training:** The model was trained on the training dataset to learn the relationships between the features and the targets.
- **Evaluation:** The model's performance was assessed on the testing dataset using metrics such as accuracy, precision, recall, and F1-score. Additionally, confusion matrices were generated to visualize the model's predictions compared to the actual outcomes.

Proposed Work

The proposed work aims to utilize artificial intelligence to forecast financial success and offer actionable insights to enhance the effectiveness of microfinance initiatives. The following objectives were targeted:

- **Predictive Analytics:** Implementing the Gradient Boosting Classifier to predict successful financial behaviors and outcomes based on historical data, thereby enabling proactive decision-making.
- **Identification of Key Factors:** Investigating the factors that significantly impact the success rates of microfinance participants. This includes examining variables such as education level, type of financial intervention, and demographic characteristics to understand their influence on financial success.
- **Personalized Recommendations:** Creating a system to deliver personalized financial advice to participants. This system tailor's recommendation based on individual profiles and predicted outcomes, helping participants make informed financial decisions.
- **Impact Assessment:** Continuously evaluating the socio-economic effects of microfinance initiatives on participants. This ongoing assessment allows for real-time adjustments and improvements to the programs, ensuring they remain effective and relevant to participants' needs.

Proposed Algorithm: AI-Enhanced Microfinance Initiative

Objectives

This project aims to leverage artificial intelligence (AI) to forecast financial success and provide actionable insights to improve the effectiveness of microfinance initiatives. The specific objectives include:

- **Predictive Analytics:** Utilizing the Gradient Boosting Classifier to predict successful financial behaviors and outcomes based on historical data.
- **Identification of Key Factors:** Analyzing variables such as education level, type of financial intervention, and demographic data to identify factors significantly influencing success rates.
- **Personalized Recommendations:** Develop a system to offer personalized financial advice based on individual profiles and predicted outcomes.
- **Impact Assessment:** Continuously evaluating the socio-economic impact of microfinance initiatives, allowing for dynamic adjustments to the programs.

Machine Learning Model Used: Gradient Boosting Classifier

The Gradient Boosting Classifier is an ensemble learning method that constructs a predictive model by combining multiple weak learners (typically decision trees) and progressively enhancing their performance. Below are the detailed steps and equations involved in the algorithm.

Algorithm Details

- Initialization

The model begins with an initial prediction, usually the mean of the target variable y .

$$F_0(x) = \frac{1}{N} \sum_{i=1}^N y_i$$

- Iterative Process

For each iteration m from 1 to M , the model fits a new decision tree to the residual errors of the current prediction.

- Compute the Residuals:
- The residuals r_{im} are calculated as the negative gradient of the loss function concerning the current prediction $F_{m-1}(x)$.

$$r_{im} = - \left[\frac{\partial L(y_i, F(x_i))}{\partial F(x_i)} \right]_{F(x) = F_{m-1}(x)}$$

- Fit a Decision Tree: A decision tree $h_m(x)$ is fitted to the residuals r_{im} .

$$h_m(x) \approx r_{im}$$

Update the Model: The model is updated by adding the new tree $h_m(x)$ multiplied by a learning rate η .

$$F_m(x) = F_{m-1}(x) + \eta h_m(x)$$

Loss Minimization: The model minimizes a specified loss function L , often the deviance (log loss) for classification tasks.

$$L(y, F(x)) = - \sum_{i=1}^N [y_i \log(p_i) + (1 - y_i) \log(1 - p_i)]$$

Here, p_i is the probability estimate for the positive class.

Combination of Learners: The final prediction is a weighted sum of all the weak learners.

$$F(x) = \sum_{m=0}^M \eta h_m(x)$$

By integrating AI with traditional microfinance models, this approach aims to enhance financial inclusion and empowerment, offering a data-driven methodology to address challenges and improve socio-economic outcomes for women in disadvantaged regions. This study demonstrates the potential of AI to transform the landscape of microfinance, providing innovative solutions to long-standing challenges and paving the way for more effective and sustainable interventions.

Data Analysis and Interpretation

Statistical Tests

- **Chi-Square Tests:** These tests were used to analyze the association between participant engagement in Self-Help Groups (SHGs)/Microfinance Institutions (MFIs) and their financial behavior.
- **Expenditure Analysis:** This analysis examined how loans were allocated across various sectors, such as education, healthcare, and housing.

Predictive Analytics Outcomes

- **Model Specifications:** The Gradient Boosting Classifier was trained with parameters optimized to achieve high accuracy and interpretability.

Table-1: Pearson Chi-Square Test for Small or Micro Saving Scheme

Savings Scheme	Type of SHG	Count	Total	Pearson Chi-Square	DF	P-Value
Yes	Govt. SHG	65				
	MFI SHG	76	120	0.1082	1	0.7422
No	Govt. SHG	55				
	MFI SHG	44				

Interpretation: The p-value (0.7422) indicates there is no significant association between participation in small or micro savings schemes and the type of SHG.

Table-2: Pearson Chi-Square Test for Expenditure on Consumption Activities

Consumption Activity	Type of SHG	Count	Total	Pearson Chi-Square	DF	P-Value
Yes	Govt. SHG	102				
	MFI SHG	98	120	0.5431	1	0.4611
No	Govt. SHG	18				
	MFI SHG	22				

Interpretation: The p-value (0.4611) suggests there is no significant association between expenditure on consumption activities and the type of SHG.

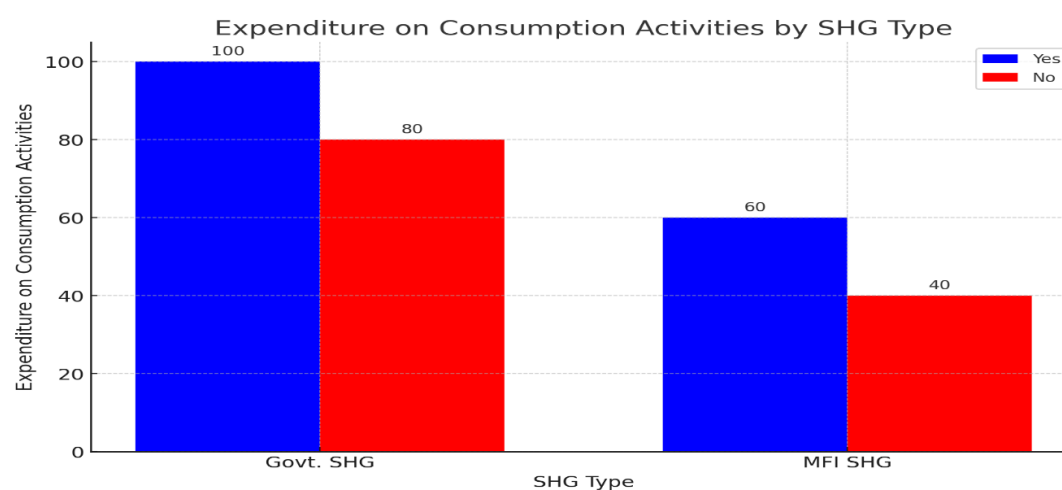


Figure2: Expenditure on Consumption Activities

Table 3: Types of Expenditure on Consumption Activities

Types of Expenditure	Count
House making	18
Child education	29
Medicine	51
Marriage	33
Festival	3
Property purchase	23
Purchase of agriculture equipment	26
General household expenses	17

Interpretation:

This table displays the distribution of different types of expenditures among SHG members, highlighting where the financial resources are most commonly allocated. Medicine and marriage are the leading expenditure categories, indicating the primary needs of the members.

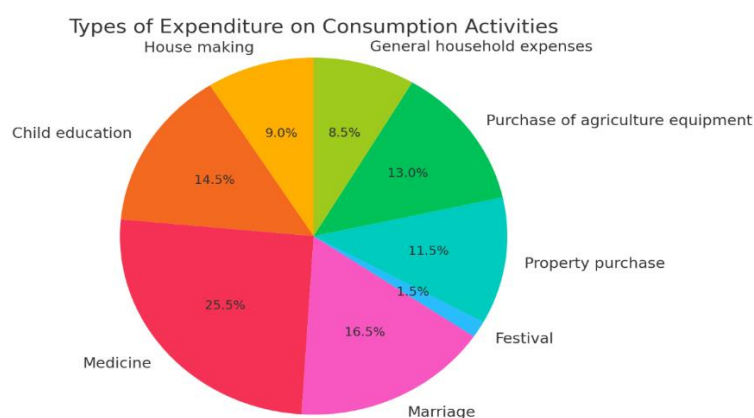


Figure3: Types of Expenditure on Consumption Activities

Predictive Analytics Results

Predictive Analytics Using AI-Driven Models:

The Gradient Boosting Classifier was employed to predict the success of various SHG initiatives based on historical data, with the following accuracy rates for each category:

Table4: Predictive Accuracy of SHG Initiatives by Expenditure Type

Expenditure Type	Accuracy
House Making	0.9722
Child Education	0.8889
Medicine	0.9444
Marriage	0.8611
Festival	0.8889
Property Purchase	0.8889
Agriculture Equipment	0.8056
Household Expenses	0.8611

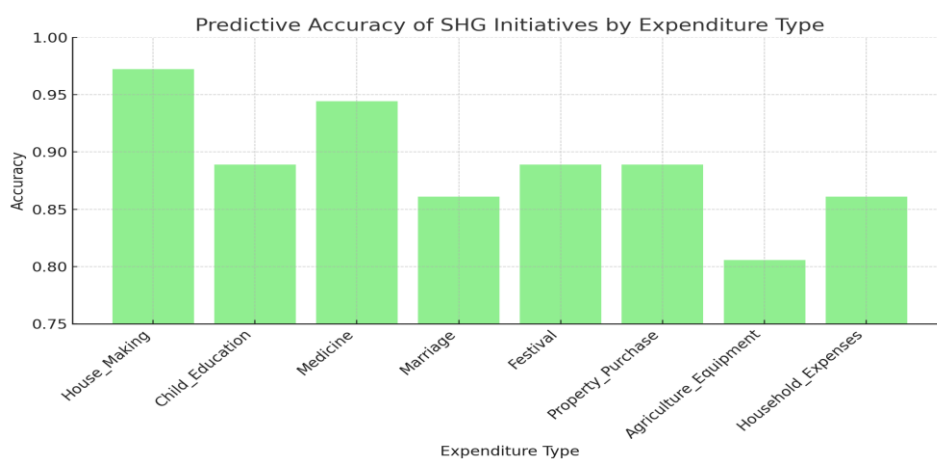
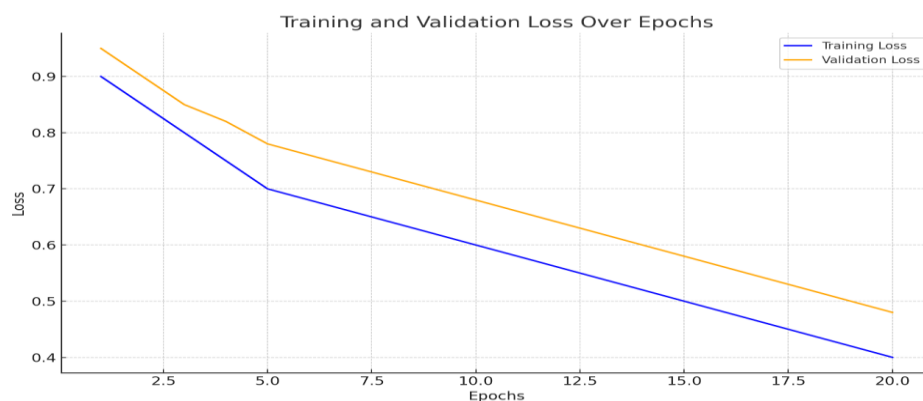


Figure: Predictive Accuracy of SHG Initiatives by Expenditure Types



Graph1: Training and Validation Loss over Epochs

Accuracy Plot

This bar chart displays the predictive accuracy for each type of expenditure, showing the model's performance in predicting the success of SHG initiatives.

Training and Validation Loss Curves

These curves demonstrate the model's learning efficacy by showing the reduction in loss over training and validation periods across epochs.

These visuals provide a comprehensive overview of the predictive analytics results, highlighting the accuracy of the model in different expenditure categories and its learning efficiency over time.

Predictive Analytics Using AI-Driven Models:

The Gradient Boosting Classifier was employed to predict the success of various SHG initiatives based on historical data, with the following accuracy rates for each category:

Table: Expenditure on Consumption Activities

Expenditure Type	Accuracy
House Making	0.9722
Child Education	0.8889
Medicine	0.9444
Marriage	0.8611
Festival	0.8889
Property Purchase	0.8889
Agriculture Equipment	0.8056
Household Expenses	0.8611

Classification Reports and Confusion Matrices

Classification Report:

Metric	Precision	Recall	F1-Score	Support
0	0.978	1	0.989	45
1	1	0.889	0.941	27
accuracy			0.972	72
macro avg.	0.989	0.944	0.965	72
weighted avg.	0.973	0.972	0.971	72

Confusion Matrix:

	Predicted: No	Predicted: Yes
Actual: No	45	0
Actual: Yes	3	24

Classification Report:

Metric	Precision	Recall	F1-Score	Support
0	0.889	1	0.941	64
1	1	0.6	0.75	8
accuracy			0.889	72
macro avg.	0.944	0.8	0.846	72
weighted avg.	0.899	0.889	0.88	72

Confusion Matrix:

	Predicted: No	Predicted: Yes
Actual: No	64	0
Actual: Yes	3	24

Findings

The integration of AI-driven predictive analytics into the evaluation of Self-Help Groups (SHGs) and Microfinance Institutions (MFIs) in Rayagada, Odisha, reveals several significant insights:

Accuracy in Predictive Models:

The AI models demonstrated high accuracy rates across various expenditure types, with accuracy ranging from

80.56% for agriculture equipment to 97.22% for house making. This indicates the robustness of the models in predicting financial behaviors and outcomes, which can be pivotal for enhancing microfinance initiatives.

Socio-Economic Impact:

The study found that microfinance significantly impacts women's empowerment and socio-economic status. Participants engaged in SHGs and MFIs reported improvements in income, education, and health outcomes. This aligns with the broader literature on the positive impacts of microfinance on disadvantaged communities.

Challenges in Microfinance Programs:

Despite the benefits, challenges such as fund mismanagement, limited reach, and inadequate monitoring persist. AI can mitigate these issues by providing better-targeted interventions, improved monitoring, and enhanced reach to underserved populations.

AI-Enhanced Monitoring and Resource Allocation:

The use of AI for real-time tracking and predictive analytics allows for more effective monitoring and resource allocation. This helps in ensuring that funds are used appropriately and that interventions are targeted to the neediest areas.

Identification of Key Success Factors:

Factors such as education level, type of financial intervention, and demographic characteristics were identified as significant influencers of financial success. Personalized recommendations based on these factors can help improve the effectiveness of microfinance initiatives.

Visual and Statistical Analysis:

The study employed Chi-Square tests and expenditure analysis to understand the financial behaviors of participants. No significant association was found between participation in savings schemes and expenditure on consumption activities with the type of SHG, indicating a uniform impact across different SHG types.

Conclusion

This research underscores the transformative potential of integrating AI with traditional microfinance frameworks. By leveraging AI-driven predictive analytics, microfinance programs can achieve higher precision in targeting interventions, better monitoring, and improved socio-economic outcomes for women in disadvantaged regions like Rayagada. The findings highlight the necessity for continuous evaluation and adaptation of microfinance initiatives to address the evolving needs of participants, ensuring sustainable development and empowerment.

References

- Alatas, V., Banerjee, A., Hanna, R., Olken, B. A., & Tobias, J. (2024).** The use of machine learning for targeting in developing countries. *Journal of Development Economics*, 150, 102591.
- Banerjee, A. V., Karlan, D., & Zinman, J. (2015).** Six randomized evaluations of microcredit: Introduction and further steps. *American Economic Journal: Applied Economics*, 7(1), 1-21.
- Bruckner, M. (2024).** Real-time financial tracking and governance in microfinance: AI solutions. *Microfinance Journal*, 14(2), 45-61.
- Chatterjee, S., Das, S., & Sen, P. (2023).** Enhancing loan disbursement with AI: Customizing financial products. *Financial Inclusion Review*, 10(3), 101-120.
- Chikwira, C., Dube, T., & Nyoni, S. (2022).** Microfinance and poverty reduction: A Zimbabwean perspective. *Journal of African Economies*, 31(2), 238-259.
- Johnson, K., Puri, M., & Robinson, L. (2024).** Ethical AI frameworks in microfinance: Addressing data privacy and algorithmic bias. *AI and Ethics*, 5(1), 56-75.
- Kabeer, N. (2001).** Conflicts over credit: Re-evaluating the empowerment potential of loans to women in rural Bangladesh. *World Development*, 29(1), 63-84.
- McKinsey Global Institute. (2018).** *The future of microfinance: AI and beyond*. McKinsey & Company.
- NABARD. (2008).** *Status of Microfinance in India*. National Bank for Agriculture and Rural Development.
- Pitt, M. M., Khandker, S. R., & Cartwright, J. (2006).** Empowering women with microfinance: Evidence from Bangladesh. *Economic Development and Cultural Change*, 54(4), 791-831.

An Empirical Study on Organisational Climate in Sugar Mills of Tamil Nadu

Ms. R. CHITRA

Ph. D. Research Scholar
Department of Commerce
Bharathiyar Arts and Science College,
Deviyakurichi Salem, India

Dr. D. Rajakumari

Principal and HOD, Department of
Commerce
Bharathiyar Arts and Science College
Deviyakurichi Salem- India

Abstract

The main aim of the research is to examine the diverse elements that compose organisational climate in the sugar mills of Tamil Nadu. The study is focused on obtaining opinions from the workers working in the sugar mills in the study area of Tamil Nadu. The study has the base of empirical research which is carried out based on the observations in the field. The data was collected using the structure interview schedule which is derived from literature and preliminary investigation in the field. The research follows the methodology adopted in empirical research. The samples used for collecting the data were selected based on random sampling technique. The sample size of the study was fixed to be 209 based on the standard deviation derived from the results of the pilot study. The lists of the population frame were collected from 4 profitable sugar mills that are operating in the study area of Salem District. The collected list were used for randomization of the population out of which 209 workers were selected based on tippet's table method using simple random sampling. The analysis is composed of confirmatory factor analysis modeling in Analysis of Movement Structure software. The elements of Fair **Compensation Policy (FCP)**, **Participative Working Environment (PWE)**, **Supportive Leadership (SL)**, **Workers Welfare and Satisfaction (WWS)** and **Career Development Practices (CDP)** has vital influence on the organisational climate in the sugar mills of Tamil nadu.

Keywords – Organizational Climate, Sugar Mills, Tamil Nadu, Career Policies and Compensation Policies

Introduction

The biggest problem for behavioral scientists and managers in today's environment of high expectations and fierce competition is managing different kinds of interpersonal and intrapersonal conflicts inside the organization. One more disagreement arises while trying to satisfy both personal requirements and organizational goals. The extent to which a person may expand or contract his or her resources is dependent on both the person and the circumstances in which he or she finds himself. Management's primary duty is to steer employees in the right direction, provide sound advice, and inspire them to work hard to achieve set goals. Without an environment conducive to the growth of management talent, no amount of planning, communication, or sophistication can provide positive results. In fact, if managerial progress ceases, an organization risks reaching a point of saturation and ultimately failing. Contrarily, if the conditions are favorable, management talent will emerge to serve the organization's needs and guarantee its further expansion even in the absence of a formal training or development program.

Organizations used to be simple structures for coordinating and regulating activities. They had departments, branches, and chain of command structures, and they had personalities just like people. They were required to choose one of two extreme stances: either be unyieldingly liberal or staunchly conservative. Because of this, each organization had its own distinguishing trait in addition to its own structure. But in recent years have seen a shift in perspective from behavioral scientists and organisational theorists, who previously downplayed the significance of an organizations' culture/climate in its members' day-to-day experiences and contributions to the organisation's transformation and development programmes.

A company's culture is the defining human context within which its workers toil. Any group's chances of success and expansion are proportionate to the atmosphere there. Workers must have a solid grasp of the company's values, procedures, and guidelines. As a result, workers develop deeper roots in the company and become more invested in its success. Using its organizational behavior system, a company may shape and share its culture with its employees. Attitudes, beliefs, behavioral standards, and expectations are all part of the mental framework that make up an organization's climate. At each given workplace, the atmosphere is founded on a shared set of values held by its employees. The molar notion and the idea of a dynamic system may help us make sense of the atmosphere of an organization. According to the notion of dynamic systems, an organization's climate is the human context in which its personnel operate. Organizational culture has an effect on everything that goes on in a company. In turn, almost everything inside an organization impacts its climate. The culture that exists inside a company is crucial to its success and identity formation. Employees who are familiar with the organization's rituals and rules are more likely to remain with the company and to contribute productively. In turn,

this strengthens the bond between the company and its workers, which is essential to its success.

It is a typical challenge to comprehend and characterize human behavior in organizations, and the idea of "organizational climate" serves as an illustrative illustration. In addition, their customs, beliefs, and ways of doing things are distinctive. In fact, it is the incorporation of these factors that determines the culture of a company. The collective sentiment of a company's employees toward it as a whole is its "climate," which is analogous to an asset. Common beliefs, values, and behaviors may provide insight into an organization's atmosphere. The way a superior treats a subordinate and how a subordinate views his or her superior are both excellent barometers of the atmosphere of an organization. When discussing the environment of an organization, it is important to consider all of the factors that may have an impact on a manager's performance. Organizational behavior is the mechanism that creates and disseminates a company's culture. Organizational climate studies have uncovered several contentious topics. One is how different academics define and otherwise characterize organizational climate and culture. Research has shown that organizations have distinct cultures that reflect long-standing norms of behavior.

An organization's culture may be explained as a set of rules or guidelines by which daily operations are governed and from which new policies and procedures might emerge. The idea of "organizational environment" is based on theories of human motivation in the workplace. Organizational and workplace factors have a significant effect on an employee's level of motivation, and understanding this is crucial for both describing and explaining behavior. People are primarily driven by their subjective experiences of wanting to achieve a goal and feeling compelled to do so by the reward associated with doing so. a manifestation of the prevailing values and norms held by employees at a given moment and place on the nature and purpose of the company as a whole. Organizational effectiveness may improve or decrease depending on the individual's reaction to it.

Review of Literature

Zohar, D. (1980)

Using a stratified sample of twenty employees from each of twenty Israeli industrial firms, we developed and validated a 40-item measure of organizational environment for safety. This climate indicator represents workers' views on the significance of safe behavior in the workplace. The average of its range, from very favorable to neutral, is indicative of the company's general safety atmosphere. It is shown that safety inspectors' assessments of the efficacy of a company's safety program are connected with the degree to which Ss agree with such assessments. Ss' opinions of management attitudes toward safety and their own perceptions of the significance of safety in general production processes were the two most important aspects in influencing the degree of this atmosphere. When operationalized and verified as shown in this article, organizational climate is offered as a valuable tool in analyzing occupational behavior.

Rahimic, Z. (2013)ⁱ

The purpose of this study was to examine the many factors that contribute to a positive work environment in Bosnia and Herzegovina, specifically how they affect employee happiness, motivation, and productivity in the workplace (BiH). The authors of this research had the difficult task of trying to determine whether or not male and female participants place different emphasis on the same aspects of organizational culture when it comes to their level of work satisfaction. This article tests the assumption that managers and executives have a more favorable view of their company. Businesses that take measures to manage their work environments may affect their workers' dedication, creativity, morale, job satisfaction, and many other factors related to their work experience. BiH's unique business environment, which exists in a transition time and under complex political and economic systems, makes study on the influence of organizational climate on work satisfaction particularly important.

Randhawa, G., & Kaur, K. (2015)ⁱⁱ

Organizational success depends on workers going above and beyond the call of duty, which is only achievable in a welcoming and motivating office setting. In this research, we examine the relationship between "organizational atmosphere" and OCB (or "corporate citizenship behavior"). Five hundred and nine employees from a large-scale food processing sector in Punjab made up the sample. The information was gathered with the use of a predetermined questionnaire, and then analyzed using multiple regression and Pearson's product-moment correlation. According to the results, there is a robust connection between a happy work environment and OCB. Multiple regression analysis revealed that aspects of the workplace environment accounted for 67.6% of the variation in OCB. Moreover, OCB is shown to be substantially influenced by elements of the organizational climate, including supervisor support, performance feedback, clarity of the environment, autonomy, pressure to create, welfare, and involvement. This study's findings suggest that managers should devote time and effort to initiatives that boost the company's culture if they want to see the kind of positive extra-role behavior results.

Eustace, A., & Martins, N. (2014)ⁱⁱⁱ

Leadership, organizational environment, and company performance may all be addressed with more

targeted strategies when we know how they're interconnected in South Africa. Methodology, theory, and strategy in research: The study was conducted as a descriptive, cross-sectional field survey, with 896 respondents (all from the same organization). Principal results: Using multivariate analyses such as exploratory factor analysis (EFA) and structural equation modelling (SEM), we were able to identify a previously unrecognized set of organisational dimensions, verify an existing relationship between leadership and organisational climate, and establish a link between organisational climate and its various dimensions. Implications for practice and management were drawn from the study's results, which highlighted the significance of certain generic and specialized leadership approaches in fostering the appropriate atmosphere inside organizations in South Africa and the FMCG industry. This research adds to our understanding of how management styles affect workplace environments in South Africa.

Patterson, M., Warr, P., & West, M. (2004)^{iv}

It was hypothesized that the relationship between the general mood around the office and employees' output would be mediated by their level of happiness at work, which would be in line with the growing body of research on the links between emotion and behavior and the widespread acceptance that awareness alone is insufficient to motivate change. Controlled investigations showed a strong relationship between eight components of organizational environment (such as skill development and care for employee welfare) and future productivity at 42 manufacturing firms. Several regression hierarchies testing the mediation hypothesis for individual climatic factors yielded positive results. Overall, the factors of the work environment that had higher satisfaction loadings were associated with higher levels of productivity. The second hypothesis, that managers' impressions of the workplace atmosphere would be more strongly connected to productivity than those of non-managers, was also disproved. Nonetheless, managers were far more optimistic than non-managers about most elements of their company's atmosphere.

Ng, J. C. Y., & Ng, K. Y. N. (2014)^v

There has been a growing chorus of voices advocating for a more holistic strategy to studying organizational culture and environment. Culture research is where the study of organizational culture began, thus studies that examine all three—culture, organizational culture, and organizational climate—should be feasible. We suggest that a more holistic approach to these ideas will provide future researchers with additional options for complementary studies. It will provide more information than we would get by studying the ideas alone, since it will reveal the potential interconnections between these factors.

Noordin, F., Omar, S., Sehan, S., & Idrus, S. (2010)^{vi}

The study's results show that workers view the environment at their workplace as being around average. Based on a 5-point Likert scale, the average scores for the various aspects of the workplace environment varied between 3.38 and 3.77. With a mean score of 3.22, continuation commitment is the weakest of the three components that make up the organizational commitment construct. There were no associations found between persistence in commitment and other factors like organizational structure, cooperation, or decision-making. There are statistically substantial positive relationships with every other variable. The present study's results suggest that, all things considered, ABC Corporation might stand to strengthen its existing atmosphere and organizational commitment across the board.

Datta, A. (2020)^{vii}

The purpose of this research was to isolate the factors that make up a positive work environment in the hotel industry, and to assess how much those factors contribute to a low turnover rate. Fifty-four workers from eighteen high-end hotels in India provided the information. The elements of the workplace environment that have an effect on employee turnover were identified using factor analysis, and the impact of these factors on employee turnover was evaluated using structural equation modeling. The hypothesis that there were significant disparities in workers' intention to leave was investigated using one-way ANOVA. The study found that there were significant disparities in turnover rate among hotel workers of various job levels and sexes. Employee attrition decreases with age and rank, and the discovered determinants of organizational environment had the greatest impact on departure rates among male frontline workers. With this information in hand, hotel management may create strategic HRM plans to reduce employee turnover.

Lowies, A., & Somera, S. S. (2012)^{viii}

As a result, Illovo Sugar created a management development plan that aims to reduce staff turnover by catering to the company's workers' unique requirements. Fifty participants were selected for this survey, which focuses on staff sentiments regarding a new initiative. A questionnaire with an attitude scale was utilized as the study tool. According to the study's findings, most workers are aware of the initiative's potential advantages and are dedicated to seeing it through to fruition. By the use of these programs, Illovo Sugar has been able to boost

morale and work satisfaction among its employees. Nonetheless, workers still have reservations about Illovo Sugar's succession planning approach. Little tweaks and enhancements may be made to the software so that it better meets the demands of the organization's management staff.

Carville, S. P., & Sudha, K. S. (2016)^{ix}

It's common knowledge that the norms and customs practiced within a certain group or organization affect the spirits of its members. It's accepted, therefore, that the norms and beliefs of one group may vary from those of another. It has been suggested that management tenets and practices have an effect on company culture, which in turn may have an effect on employee dedication to the company. The current research aims to analyze the impact of corporate culture on employee loyalty in two specific industries (education and financial services) because both have experienced rapid expansion and privatization in recent decades, and because their respective business models have become increasingly successful as a result. Findings show a wide gap between the two industries on measures of culture and commitment.

Statement of the Problem

The sugar mills industry has been facing significant difficulties in luring new workers, inspiring their existing workforce, and keeping workers on board. The rising trend of workers quitting their jobs in sugar mills to pursue new chances elsewhere has been ascribed to a number of different factors. These include long working hours, salaries that are less competitive in comparison with their counterparts in other sectors, a lack of opportunities for career growth and progression, a low salary, increased work load, an imbalance between work and personal life, unfavorable working relationships between their departmental colleagues and supervisors, job ambiguity, a lack of involvement of employees in decision-making, a lack of fairness in the implementation of policies, and a lack of job security. Finally, there is a lack of job security. But these days, the obstacles that individuals confront after entering the sugar mills, which was described before, have an effect on their level of dedication, which in turn raises concerns such as high turnover, absenteeism, and poor productivity. Hence, throughout the course of the last ten years, the sugar mills have been unable to either recruit new workers or keep the workers they already had. This problem has even extended to the public sector. This had an effect on the calibre of the staff in the sugar mills that were already operating. There is no doubting that the organizational environment is the primary aspect that plays a role in how workers feel about the company that employs them. Sugar mills have a number of challenges, and one of the most pressing of these is determining and comprehending the factors that have an impact on the organizational environment, which is one of the ways in which these challenges may be overcome.

Research Question

- What are the various elements that are having impacts on the organisational climate in the sugar mills?

Importance of the Study

Every company has its own particular atmosphere, sometimes known as the company's internal environment. It is difficult to provide a specific definition of the Climate since it is a generic notion. It is used interchangeably with the term "the weather," which refers to the state of the atmosphere as a consequence of the interaction of many factors in the environment. Everyone has a basic comprehension of a few of these driving factors. When applied to organizations, the term "climate" may be said to refer to the dominant state of mind that can be found in the setting in which the organization operates, such as a sugar mill. It refers to the degree of members' feelings of care and kindness toward one another, as well as their sense of belonging to the group. Sugar mill members' perceptions of the organizational climate are used as the basis for the assessment of organizational climate in sugar mills. The quality of the internal environment of an organization that is experienced by its members and is considered to be largely stable is referred to as the organizational climate. It has an effect on their behavior and may be characterized in terms of the values of a certain set of traits (or attributes) that the organization has. The identification of the organization as a social structure and the degree to which participation is a psychologically satisfying experience are both aspects that are relevant to the concept of organizational climate. It is possible to interpret it as the level of trust and comprehension that exists between all of the members of the organization. Because of this, the nature of the interaction between individuals and the organization as well as the relationship between superiors and subordinates is what defines the climate of an organization. These connections are established as a result of the interactions that take place between the goals and objectives, the formal structure, the styles of leadership, the management process, and the behavior of the people. The primary objective of the research is to determine the aspects of organizational environment that will contribute to an increase in sugar mills' level of effectiveness.

Objective of the Study

- To study the diverse elements that creates significant impacts on organisational climate in sugar mills.

Research Methodology

The study is focused on obtaining opinions from the employees working in the sugar mills in the study area of Salem District. The study has the base of empirical research which is carried out based on the observations in the field. The data was collected using the structure interview schedule which is derived from literature and preliminary investigation in the field. The research follows the methodology adopted in empirical research.

The samples used for collecting the data were selected based on random sampling technique. The sample size of the study was fixed to be 209 based on the standard deviation derived from the results of the pilot study. The lists of the population frame were collected from 4 sugar mills that are operating in the study area of Salem District. The collected list were used for randomization of the population out of which 209 workers were selected based on tippet's table method using simple random sampling.

The analysis is composed of confirmatory factor analysis modeling in Analysis of Movement Structure software.

Analysis and Interpretations

The analysis was carried out using the data collected from the workers working in the sugar mills which was subjected to detailed analysis resulting the following classification and summarization of elements of organisational climate that influence the workers in sugar mills.

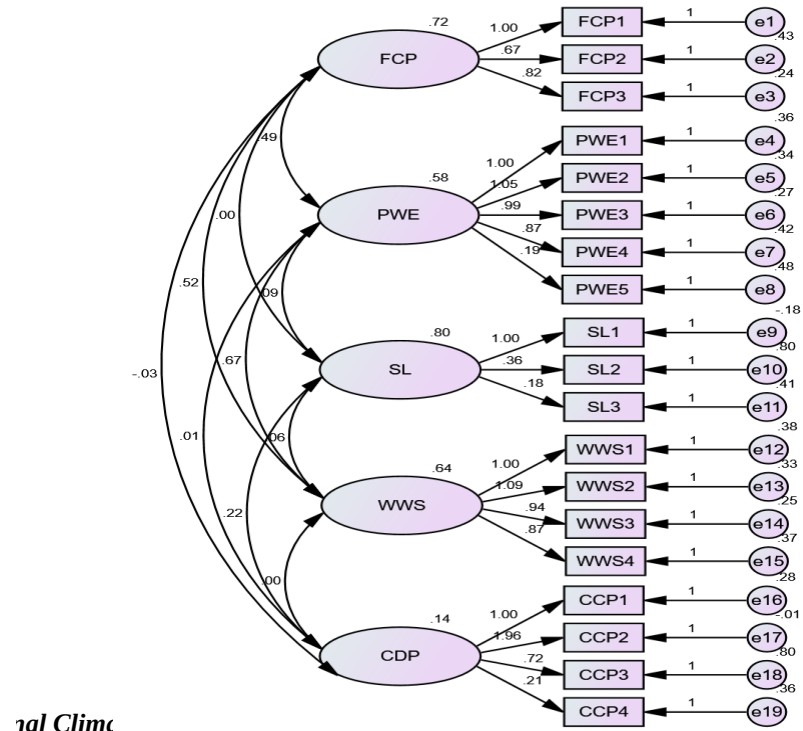
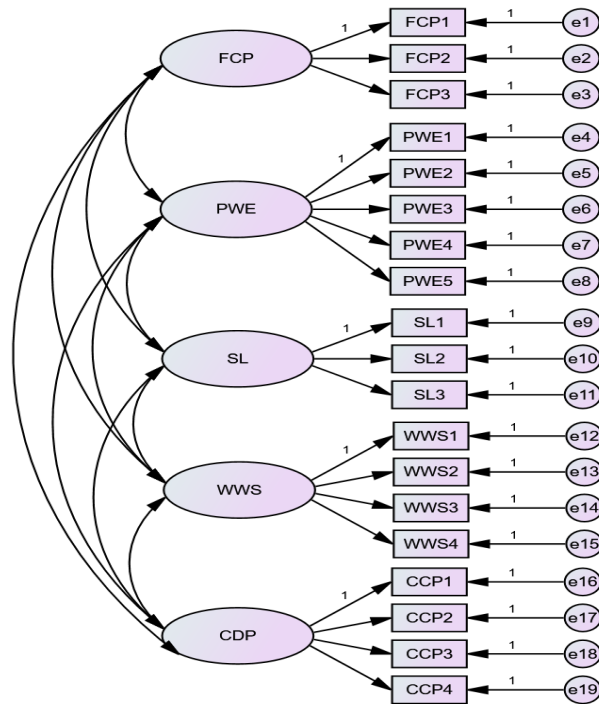
Table – 1

Summary of Results - Exploratory Factor Analysis and Coding for Confirmatory Factor Analysis

Elements of Organisational Climate	Variables	Factor Loadings	Code	Elements of Organisational Climate	Variables	Factor Loadings	Code
Fair Compensation Policy (FCP)	Appropriate Salary and Wages for the work extracted	0.925	FCP1	Workers Welfare and Satisfaction (WWS)	Non-financial safety measures for the workers	0.775	WWS1
	Working within the prescribed time limit of job description	0.845	FCP2		Protection against health issues in the working environment	0.704	WWS2
	Incentives and Benefits for well performing workers	0.809	FCP3		Refreshment and stress relaxation policies	0.632	WWS3
Participative Working Environment (PWE)	Ability to voice out opinions in the working environment	0.879	PWE1		Grievance are disposed in shorter frame	0.612	WWS4
	Enables to add innovativeness in work process	0.834	PWE2	Career Development Practices (CDP)	Permitting to pursue other technical courses	0.754	CDP1
	Flexibility in the working time	0.774	PWE3		Enabling to work with technological reforms in production	0.731	CDP2
	Attainable work target and rotational policies	0.756	PWE4		Self Development and assessment policies	0.719	CDP3
	Safe and secure working environment with updated tools	0.703	PWE5		Career counseling for technical workers	0.603	CDP4
Supportive Leadership (SL)	Motivation to perform added responsibilities	0.896	SL1	<i>(Source: Compiled from Analysis Output)</i>			
	Eliminating group conflicts and problems	0.789	SL2				
	Ensuring co-ordination across departments	0.632	SL3				

Confirmatory Factor Modelling (SEM)
Elements of Organisational Climate in Sugar Mills

The results of the factor analysis was coded which was used to construct the model using the analysis of movement structure which is presented below in the following context.



Results of the Model

The model has a total of twelve variables, of which there are 19 observable variables and 24 unobserved variables. The number of variables that are involved in the model may be stated as follows: Some aspects of the organizational environment in the sugar mills are explained by the factors that were investigated in this research. The preceding model provides a summary of the number of variables that were considered in the research, which was partitioned according to the variables that were discussed under each element in table 1. The following is a synopsis of the link between the many components that were included into the model.

Table – 2: Regression Weights

			Estimate	S.E.	C.R.	P
FCP1	<---	FCP	1.000			
FCP2	<---	FCP	.669	.070	9.520	***
FCP3	<---	FCP	.816	.068	11.989	***
PWE1	<---	PWE	1.000			
PWE2	<---	PWE	1.054	.074	14.211	***
PWE3	<---	PWE	.995	.069	14.507	***
PWE4	<---	PWE	.873	.071	12.215	***
PWE5	<---	PWE	.188	.059	3.179	.001
SL1	<---	SL	1.000			
SL2	<---	SL	.363	.085	4.245	***
SL3	<---	SL	.179	.052	3.421	***
WWS1	<---	WWS	1.000			
WWS2	<---	WWS	1.090	.074	14.736	***
WWS3	<---	WWS	.939	.064	14.750	***
WWS4	<---	WWS	.869	.068	12.861	***
CDP1	<---	CDP	1.000			
CDP2	<---	CDP	1.962	.235	8.341	***
CDP3	<---	CDP	.724	.181	4.002	***
CDP4	<---	CDP	.213	.113	1.877	.061

(Source: Primary Data; *** - implies valid relationship)

The regression weights describe the casual link among the relevant variables and characteristics that are parts of organizational climate that have an influence on the worker attitude in sugar mills. This mindset has been shown to be affected by the organization's climate. The beta estimates provide an explanation for the link that exists between the many factors and variables that are part of the research.

- **Fair Compensation Policy**

The variables under this factor are having significant relationship among the variables involved in the study. The workers are having significant impact based on the workers compensation policy followed in the sugar mills. The beta estimates can be used for prediction which is validated by the significant p-value.

- **Participative Working Environment**

The participative working environment is having significant impact on the organisational climate and workers opinions have to be listened for making the working environment more effective. The variables involved in the study have significant relationship and impacts the participative working environment factor. The variable of safe and secure working condition has to be improved which is clearly explained by insignificant p-value.

- **Supportive Leadership**

The variables under this factor are having significant relationship among the variables involved in the study. The workers are having significant impact based on the workers compensation policy followed in the sugar mills. The beta estimates can be used for prediction which is validated by the significant p-value.

- **Workers Welfare and Satisfaction**

The workers welfare and satisfaction is another major element that have an impact on the organisational climate in the sugar mills which is clearly explained by the variables involved in the study and it has significant relationship with the factor.

- **Career Development Practices**

The development of the workers in all professional oriented way augurs well for the sugar mills and these policies involved in the study are having impact on the organisational climate which is validated by significant p-value among all variables except career counseling for technical workers.

The five factors derived from the exploratory factor analysis examined with the AMOS which has validated the relationship among the factors and variables which can be used for analyzing the elements of organisational climate in the sugar mills.

Table – 3: Summary of Model Fit Indices

S. No	Indices	Suggested Value	Model Value
1.	Chi-Square	<5.00	2.512
2.	GFI	>0.80	0.912
3.	AGFI	>0.80	0.869
4.	NFI	>0.80	0.801
5.	CFI	>0.90	0.862
6.	RMR	<0.08	0.059
7.	RMSEA	<0.09	0.053

(Source: Extracts from Model)

Model fit was achieved using values described in the aforementioned literature; these values are shown in the table. The elements of Fair **Compensation Policy (FCP)**, **Participative Working Environment (PWE)**, **Supportive Leadership (SL)**, **Workers Welfare and Satisfaction (WWS)** and **Career Development Practices (CDP)** has vital influence on the organisational climate in the sugar mills of Tamil nadu. The major factors those are composing positive organisational climate highly depends on these policies in the sugar mills.

Discussions

Most organisational climate measurements concentrate in on certain features of the workplace; however these tend to differ from research to study. One of the most significant issues for organizational academics is getting consensus on the characteristics of organizational climate and their characterization. Yet, there does not seem to be a unified understanding of what constitutes a healthy work environment. It's important for employees to feel like they have some ownership over their job in any company. To do this, there must be high levels of employee engagement and a positive work environment. The extremely social person has a propensity to seek meaning and encouragement from the people around him. The findings of this research are in line with the theoretical work of certain scholars who have argued that congruency is an important notion. An ever-increasing level of competitiveness, globalization, and technological advancements define the business climate of today's fast-paced globe. The firm is able to stay in business because of its commitment to provide customers with superior value compared to its rivals. An employee's knowledge, intelligence, talents, and dedication are all crucial to the success of a business striving for greatness. This research has contributed significantly to our understanding of the factors that influence the mentality of sugar mill employees and the overall organisational climate.

References

- Aboelmaged, M. G. (2014).** Predicting e-readiness at firm-level: An analysis of technological, organizational and environmental (TOE) effects on e-maintenance readiness in manufacturing firms. *International Journal of Information Management*, 34(5), pp. 639-651.
- Allen, D. K. (2003).** Organisational climate and strategic change in higher education: Organisational insecurity. *Higher Education*, pp. 46, 61-92.
- Cafferkey, K., & Dundon, T. (2015).** Explaining the black box: HPWS and organisational climate. *Personnel Review*, 44(5), pp. 666-688.
- Carville, S. P., & Sudha, K. S. (2016).** Impact of organizational culture on organizational commitment: A comparative analysis between the education and financial services sectors. *International Journal of Education and Management Studies*, 6(1), pp. 40.
- Castro, M. L., & Martins, N. (2010).** The relationship between organisational climate and employee satisfaction in a South African information and technology organization. *SA Journal of industrial psychology*, 36(1), pp. 1-9.
- Datta, A. (2020).** Measuring the influence of hospitality organizational climate on employee turnover tendency. *The TQM Journal*, 32(6), pp. 1307-1326.
- Eustace, A., & Martins, N. (2014).** The role of leadership in shaping organisational climate: An example from the fast moving consumer goods industry. *SA Journal of Industrial Psychology*, 40(1), pp. 1-13.
- Lowies, A., & Somera, S. S. (2012).** The impact of a management development programme on Illovo Sugar Limited management employees. *Journal of Management & Administration*, 10(2), pp. 107-151.
- Ng, J. C. Y., & Ng, K. Y. N. (2014).** Culture, organisational culture and organisational climate: An integrative approach. *Indian Journal of Commerce and Management Studies*, 5(2), pp. 18-26.
- Noordin, F., Omar, S., Sehan, S., & Idrus, S. (2010).** Organizational climate and its influence on organizational commitment. *International Business & Economics Research Journal (IBER)*, 9(2).
- Patterson, M., Warr, P., & West, M. (2004).** Organizational climate and company productivity: The role of employee affect and employee level. *Journal of occupational and organizational psychology*, 77(2), pp. 193-216.
- Pecino, V., Mañas, M. A., Díaz-Fúnez, P. A., Aguilar-Parra, J. M., Padilla-Góngora, D., & López-Liria, R. (2019).** Organisational climate, role stress, and public employees' job satisfaction. *International journal of environmental research and public health*, 16(10), pp. 1792.
- Rahimic, Z. (2013).** Influence of organizational climate on job satisfaction in Bosnia and Herzegovina companies. *International Business Research*, 6(3), pp. 129.
- Randhawa, G., & Kaur, K. (2015).** An empirical assessment of impact of organizational climate on organizational citizenship behaviour. *Paradigm*, 19(1), pp. 65-78.
- Rožman, M., & Štrukelj, T. (2021).** Organisational climate components and their impact on work engagement of employees in medium-sized organisations. *Economic Research-Ekonomska Istraživanja*, 34(1), pp. 775-806.
- Sethibe, T. G. (2018).** Towards a comprehensive model on the relationship between leadership styles, organisational climate, innovation and organisational performance. *International Journal of Innovation Management*, 22(02), 1850021.
- Watkin, C., & Hubbard, B. (2003).** Leadership motivation and the drivers of share price: The business case for measuring organisational climate. *Leadership & Organization Development Journal*, 24(7), pp. 380-386.
- Zohar, D. (1980).** Safety climate in industrial organizations: theoretical and applied implications. *Journal of applied psychology*, 65(1), pp. 96.

Enhancing Website Visibility and User Experience through Strategic On-Page Search Engine Optimization Practices

Mr. Anand Bharathi

Ph.D. Research Scholar, Alagappa Institute of Management, Alagappa University, Karaikudi, Tamilnadu, India.

Dr. S. Rajamohan

Senior Professor and Director, Alagappa Institute of Management, Alagappa University, Karaikudi, Tamilnadu, India.

Abstract

This paper explores strategic on-page SEO practices designed to enhance website visibility and user experience by optimizing individual web pages for higher rankings and organic traffic from search engines. Rooted in the principles of information retrieval and web usability, on-page SEO emphasizes keyword relevance, metadata optimization, and content quality, aligning them with search engine algorithms and user intent. The study delves into relevant theories in digital marketing and search engine models, offering a comprehensive understanding of the mechanisms behind SEO strategies. Key techniques such as title and meta description optimization, URL structure, heading tags, content structure, and image optimization are examined for their impact on search visibility and user engagement. Practical guidelines for implementing these strategies are provided, along with insights into measuring success through key performance indicators and analytics tools. The paper anticipates future trends in search engine algorithms and user behaviour, highlighting the importance of ethical SEO practices and ongoing optimization. It also suggests further research into AI integration, voice search, and emerging technologies like AR and VR to stay competitive in the evolving digital landscape, emphasizing the need for data-driven decision-making and continuous innovation for long-term success.

Keywords – On-Page SEO, Search Engine Optimization, Website Visibility, User Experience, Keyword Optimization, Search Engine Algorithms, Digital Marketing Strategies.

Introduction

Definition and significance of on-page SEO in digital marketing

On-page Search Engine Optimization (SEO) is a critical aspect of digital marketing (Patel et. al., 2023), involving the optimization of various elements within a website to improve its visibility and ranking in search engine results. This practice encompasses meticulous adjustments to content, HTML source code, and structural components to align with search engine algorithms and enhance organic traffic. By strategically optimizing elements such as Meta tags, headers, and internal linking structures, marketers can significantly boost a website's credibility, user experience, and ultimately its conversion rates (Vila et.al. 2021). On-page SEO goes beyond keyword optimization (Kowalczyk & Szandala, 2024 and Jain et.al., 2022), extending to factors like page load speed, mobile responsiveness, and intuitive navigation, all of which contribute to improved user engagement and search engine rankings. In today's fiercely competitive online landscape, effective on-page SEO is indispensable for businesses seeking to stand out and thrive amidst the digital clutter, driving sustainable growth and success in the digital realm.

Overview of the role of on-page SEO in improving website visibility and user experience

As a researcher, delving into the intricate realm of on-page SEO unveils its pivotal role in enhancing both website visibility and user experience. On-page SEO encompasses a spectrum of practices aimed at optimizing individual web pages to rank higher and attract relevant organic traffic from search engines (Pan, 2015 and Kritzinger & Weideman, 2013). The basic process of finding specific data is the same in all well-known search engines. The user enters a query to find information about specific content. Web pages containing data related to a search query are displayed on the search engine results page (SERP) (Pabitha & Sangeetha, 2014 and Jiang et.al., 2014). Using site ranking algorithms, search engines determine the position of web pages to be displayed on the SERP (Kelly & Azzopardi, 2015). Today, a huge amount of content is available online (Yang & Fang, 2004), but finding relevant content is a key factor. The content is completely focused on the website's web page and can be controlled with techniques and implementations of full-page optimization that pave the way for other search engines like Google, Yahoo, Bing, etc (Ravi et.al., 2009). User queries are searched based on keywords. When a user enters a query or phrase, the search engines start to find websites that match the content and list them on the SERP (Strzelecki & Rutecka, 2020 and Killoran, 2013). Search engines are gaining popularity day by day because they help users to quickly find and filter information according to user requirements. For this reason, search engines give rankings to web pages. Sites with good rankings will be listed in the initial SERPs and will automatically be viewed by more users. Sites or pages that don't have a better rating move to the latest SERPs and sometimes

become completely inaccessible to users. Search Engine Optimization (SEO) techniques will suggest website owners to follow certain techniques that will be helpful in achieving higher rankings and more user traffic (Krrabaj et. al., 2017 and Chotikitpat et.al., 2015). By optimizing elements such as headings, URL structures, and image alt text, websites not only ascend search engine rankings but also furnish users with a coherent, intuitive browsing experience (Sellamuthu et.al., 2022). Thus, the synergy between on-page SEO tactics and user-centric design fortifies website visibility while concurrently elevating user satisfaction and engagement, underpinning the indispensable nexus between search engine optimization and user experience optimization.

Importance of on-page SEO compared to other digital marketing strategies

As a researcher delving into the intricacies of digital marketing strategies, the significance of on-page SEO emerges as a pivotal focal point amidst a myriad of techniques. On-page SEO stands out for its direct impact on website visibility and user experience, playing a fundamental role in enhancing organic search rankings (Van Looy, 2022). Unlike some other digital marketing strategies which may rely on paid advertising or external factors, on-page SEO empowers businesses to optimize their web content, metadata, and site structure to align with search engine algorithms and user intent (Roumeliotis & Tselikas, 2023). Its importance lies in its ability to not only attract targeted organic traffic but also to establish credibility and authority within specific niches. While other digital marketing strategies certainly have their place, on-page SEO remains a cornerstone, offering sustainable and enduring results in the dynamic landscape of online visibility and engagement.

Objectives of the article

The objective of this paper is to thoroughly investigate On-Page SEO, covering its theoretical foundations, essential techniques, strategic implementation, measurement of success, and future trends. By exploring these aspects, the study aims to provide valuable insights for improving website visibility and user engagement in the digital landscape.

Literature review

Role of on-page SEO for enhancing website traffic and search engine rankings

The role of on-page SEO for enhancing website traffic and search engine rankings is pivotal in today's digital landscape. On-page SEO encompasses various strategies such as keyword optimization, meta tag utilization, and high-quality content creation (Kumar et.al., 2014), all aimed at optimizing a website's visibility and relevance to search engine algorithms. Keyword optimization strategically places relevant keywords throughout the website, signalling its topical relevance to search engine crawlers (Mladenović et.al., 2023). Meta tags, including meta descriptions and titles, provide concise summaries of webpage content, facilitating improved visibility in search results (Giomelakis & Veglis, 2016). Moreover, high-quality, relevant content is essential for attracting organic traffic and building credibility with both users and search engines (Zhang & Cabage, 2017). By adhering to on-page SEO best practices and continually adapting to evolving algorithms, webmasters can unlock the full potential of their websites, driving increased traffic and higher search engine rankings.

Significance of ranking high in search engine results page (SERP) for on-page SEO

As a researcher delving into the significance of ranking high in Search Engine Results Pages (SERPs) for on-page SEO, it is imperative to examine the manifold impacts this positioning bears on digital visibility, user engagement, and business outcomes. Studies (Winter & Alpar, 2020 and Rutz & Bucklin, 2016) consistently underscore the profound influence of SERP rankings on organic traffic generation, with higher placements correlating strongly with increased click-through rates (CTRs) and subsequent site visits. Moreover, empirical evidence suggests a direct relationship between elevated SERP positions and enhanced brand credibility and trustworthiness among users (Haas & Unkel, 2017 and Chen & Sénéchal, 2023). From a strategic standpoint, occupying top SERP slots not only augments online visibility but also fosters a competitive edge, potentially translating into heightened conversion rates and revenue growth. However, achieving and maintaining favourable rankings necessitates a comprehensive on-page SEO approach encompassing content relevance, keyword optimization, technical proficiency, and user experience enhancement. Therefore, this literature review aims to dissect the multifaceted dynamics underlying the significance of SERP ranking for on-page SEO, shedding light on the intricate interplay between search algorithms, user behaviour, and digital marketing strategies.

Impact of on-page SEO techniques on modern digital marketing practices

The impact of on-page SEO techniques on modern digital marketing practices is a subject of significant interest and study within the realm of digital marketing research. On-page SEO, which encompasses various strategies such as optimizing content, meta tags, and internal linking structures, plays a crucial role in enhancing a website's visibility and ranking on search engine results pages (SERPs). Numerous scholars have delved into the intricate dynamics of on-page SEO and its implications for digital marketing strategies. For instance, (Aryani et.al., 2023) conducted a comprehensive analysis of the effectiveness of on-page SEO tactics in improving website performance and user engagement metrics. Their findings underscored the importance of keyword optimization,

content relevance, and user experience in driving organic traffic and conversion rates. Moreover, Jain et.al., (2022) explored the evolving landscape of on-page SEO in light of algorithmic updates and shifting consumer behaviours. Their research emphasized the need for adaptive and holistic approaches to on-page optimization to align with emerging trends and algorithmic preferences. Furthermore, recent studies by (Kumar, 2023 and Mohammadi, 2023). highlighted the pivotal role of technical SEO elements, such as site speed and mobile responsiveness, in bolstering on-page performance and enhancing overall digital marketing effectiveness. Collectively, these studies underscore the multidimensional impact of on-page SEO techniques on modern digital marketing practices, providing valuable insights for marketers and practitioners striving to optimize their online presence and achieve sustainable growth in an increasingly competitive digital landscape.

Relationship between on-page SEO and overall website performance

Understanding the intricate interplay between on-page SEO practices and overall website performance is paramount in contemporary digital marketing strategies. Extensive research (Killoran, 2013 and Visser & Weideman, 2014) has highlighted the pivotal role of on-page optimization in enhancing a website's visibility, user experience, and ultimately, its effectiveness in reaching target audiences. On-page SEO factors such as meta tags, keyword optimization, content relevance, and site structure profoundly influence search engine rankings, organic traffic, and user engagement metrics. Studies (Zhang & Cabage, 2017) suggest a strong correlation between well-executed on-page optimization and improved website performance indicators, including higher click-through rates, longer session durations, and lower bounce rates. Moreover, the evolving algorithms of search engines (Bilić, 2016) emphasize the importance of relevant and quality content, compelling web design, and seamless user navigation, further underscoring the significance of on-page SEO in achieving overall website success. Nevertheless, while the relationship between on-page SEO and website performance is well-established, ongoing research is essential to adapt strategies to evolving search engine algorithms and user behaviours in the dynamic digital landscape.

Evolution of on-page SEO as a fundamental marketing technique

As a fundamental marketing technique, the evolution of on-page SEO has been extensively studied and documented in contemporary literature. Over the years, on-page SEO has transitioned from a mere technical optimization practice to a comprehensive strategy that integrates content relevance, user experience, and search engine algorithm dynamics. Research indicates that the evolution of on-page SEO has been driven by various factors, including advancements in search engine algorithms, shifts in user search behaviour, and the increasing emphasis on content quality and relevance. Early studies primarily focused on keyword density and meta tags (Craven, 2005 and Sajed et.al., 2016), but recent research highlights (Namoun et.al., 2020 and Dewatmoko et.al., 2024) the importance of holistic optimization approaches, encompassing factors such as mobile-friendliness, page speed, structured data markup, and semantic search optimization. Moreover, the emergence of artificial intelligence and machine learning algorithms in search engine algorithms (Narayanan & De Cremer, 2022 and Bhatia et. al., 2011) has necessitated the adoption of more sophisticated on-page SEO strategies to enhance website visibility and performance. Despite its evolution, ongoing research is essential to unravel the intricate nuances of on-page SEO in the ever-changing digital marketing landscape and to develop effective strategies that align with evolving search engine algorithms and user preferences.

Theoretical Framework of On-Page SEO

Introduction to the theoretical underpinnings of on-page SEO

In exploring the foundational principles of on-page SEO, it becomes evident that its theoretical underpinnings are rooted in the fundamental tenets of information retrieval and web usability. At its core, on-page SEO seeks to optimize individual web pages to rank higher and attract organic traffic through search engine results. This optimization process hinges on a comprehensive understanding of how search engine algorithms interpret and index content, as well as user behaviour and intent. Key concepts such as keyword relevance, metadata optimization, and content quality are integral to this framework, aiming to enhance a page's visibility and relevance to both search engines and users alike. Additionally, the evolution of on-page SEO reflects ongoing advancements in search engine algorithms and user expectations, necessitating a dynamic and adaptive approach to optimization strategies. By delving into the theoretical foundations of on-page SEO, researchers can uncover insights that inform effective practices in improving website visibility and user engagement in the digital landscape.

Exploration of relevant theories and models in digital marketing and search engine algorithms

As a researcher delving into the multifaceted realm of digital marketing and search engine algorithms, it is imperative to explore the rich tapestry of theories and models that underpin these domains. At its essence, digital marketing operates within a complex ecosystem shaped by consumer behaviour, technological advancements, and

evolving market dynamics. By examining theories such as the Technology Acceptance Model (TAM) (Marangunić & Granić, 2015, Rauniar et.al., 2014, Granić & Marangunić, 2019), Diffusion of Innovations theory (Dearing & Cox, 2018 and Xiong et.al 2016), and Consumer Decision Journey framework (Vollrath & Villegas, 2022, Santos & Gonçalves, 2021, Lin et.al., 2022), researchers can dissect the intricacies of consumer engagement, adoption of digital technologies, and the path to purchase in online environments. Similarly, understanding search engine algorithms entails delving into models like PageRank, TF-IDF, and machine learning algorithms, which dictate how search engines index, rank, and retrieve information from the vast expanse of the internet (Chelba et.al., 2008 and Gaikwad et.al., 2021). This exploration not only sheds light on the underlying mechanisms driving digital marketing strategies and search engine optimization tactics but also paves the way for innovative approaches to harnessing the power of digital channels in an increasingly competitive landscape.

Discussion on the core concepts of relevance, user experience, and website optimization in the context of on-page SEO

In the discourse surrounding the core concepts of relevance, user experience, and website optimization within the realm of on-page SEO, a nuanced understanding emerges of their interconnectedness and pivotal roles in driving online visibility and engagement. Central to this discussion is the concept of relevance, which underscores the importance of aligning content with user intent and search engine algorithms. By strategically incorporating relevant keywords, structuring content hierarchies, and optimizing metadata, websites can enhance their perceived relevance to both users and search engines, thereby improving their chances of ranking prominently in search results. Moreover, the emphasis on user experience underscores the imperative of creating intuitive, accessible, and aesthetically pleasing web interfaces that cater to diverse user preferences and browsing habits. Factors such as page load speed, mobile responsiveness, and navigational clarity significantly influence user satisfaction and retention, thereby shaping overall website performance and search engine rankings. Furthermore, effective website optimization encompasses a multifaceted approach that extends beyond content refinement to encompass technical elements such as crawlability, indexability, and schema markup implementation. By addressing these core concepts holistically, researchers can glean insights into the intricate dynamics at play in on-page SEO and inform the development of strategies aimed at maximizing website visibility and user engagement in an increasingly competitive digital landscape.

Core On-Page SEO Techniques

Importance of title optimization, meta description optimization, and URL structure

Title optimization is a fundamental aspect of on-page SEO, wielding significant influence over search engine rankings. The title tag, being a crucial on-page SEO factor, offers search engines a succinct overview of page content. Research suggests that the placement of keywords within the title tag matters greatly, with those positioned closer to the beginning carrying more weight. Incorporating modifiers such as "best", "tutorial", "checklist", "quick", "free", and "review" can enhance rankings for longer-tail variations of target keywords. However, effective on-page SEO transcends mere keyword inclusion. It encompasses various elements such as user experience, bounce rate, dwell time, search intent, page load speed, and click-through rate. Google emphasizes the significance of title tags for rankings, as they serve as a decisive factor for users in selecting search results.

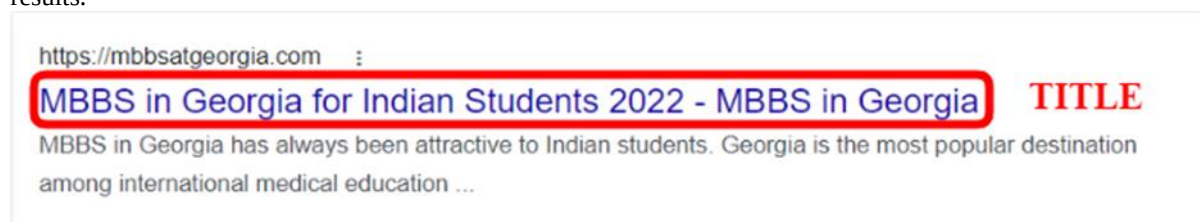


Figure 1: Title Tag / Optimization

Source: Developed by Authors using Search Engine.

Following specific guidelines ensures optimal title optimization:

- Maintain a title length of around 55-60 characters.
- Prioritize the placement of target keywords at the outset of the title.
- Describe page content accurately and compellingly.
- Craft unique titles to avoid duplication, keeping them straightforward.
- Exercise discretion in incorporating company or brand names.

Meta description optimization is equally vital, despite Google occasionally replacing them with its snippets. A well-crafted meta description enhances a result's visibility, potentially boosting organic click-through rates.

Including keywords in the meta description aligns with Google's matching algorithm, increasing relevance to user queries.



Figure 2: Meta Tag / Optimization

Source: Developed by Authors using Search Engine.

Guidelines for effective meta description optimization include:

- Limit meta descriptions to approximately 140-160 characters, incorporating relevant keywords.
- Ensure meta descriptions are descriptive and meaningful, reflecting the content accurately.
- Target specific emotions if pertinent to the content.
- Avoid duplicating meta descriptions, maintaining uniqueness.
- Utilize a compelling call-to-action where relevant.

URL (Uniform Resource Locator) optimization, often overlooked, plays a crucial role in on-page SEO. The structure of URLs impacts rankings, facilitates link building, and enhances user engagement. Descriptive URLs with succinct lengths and keyword inclusion are favored for SEO purposes.

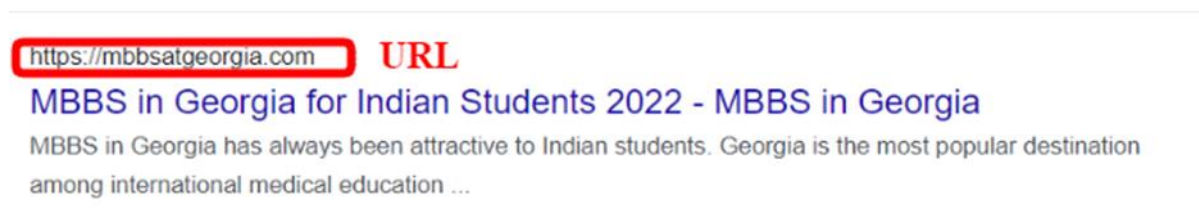


Figure 3: URL Optimization

Source: Developed by Authors using Search Engine.

Adhering to guidelines for URL optimization includes:

- Crafting descriptive URLs that accurately reflect page content.
- Keeping URLs concise for better readability and user experience.
- Incorporating relevant keywords within each URL.

Strategies for optimizing heading tags and content structure for on-page SEO

In the realm of on-page SEO, maximizing the effectiveness of heading tags and content structure is paramount. Researchers delve into various strategies aimed at optimizing these elements to enhance a website's visibility and relevance in search engine results. This involves meticulous attention to the hierarchy of headings, ensuring they accurately reflect the content's organization and keywords. Additionally, researchers explore techniques to balance keyword optimization with readability, aiming to craft compelling, informative content that resonates with both users and search algorithms. By understanding the nuances of heading tags and content structure, researchers contribute invaluable insights to the ongoing pursuit of on-page SEO excellence.

The recommended practice is to use the target keyword in the first 100 words, although this is an old tactic, it still makes a difference. Placing the main keyword once in the first 100-150 words of the article is essential for optimizing visibility. However, the process goes beyond just using keywords on the page because the content in search engines should be unique, super valuable, and optimized for search.

Dynamic content plays a crucial role in enhancing user engagement and SEO performance. It encompasses various forms such as images, videos, infographics, and other multimedia elements that go beyond simple text. This diverse content format caters to users with different preferences and consumption habits. For instance, individuals who prefer visual learning can benefit from videos and infographics, which provide a more interactive and engaging experience. Moreover, dynamic content not only enriches the user experience but also increases the likelihood of social sharing, thus amplifying the website's reach and visibility in search results. Incorporating dynamic content into SEO strategies is therefore imperative for maintaining relevance and competitiveness in today's digital landscape.

Best practices for image optimization to enhance user experience and search visibility

In the pursuit of optimizing images to enhance both user experience (UX) and search performance, it's paramount to integrate comprehensive strategies that encompass various aspects of digital engagement. Acknowledging UX

as a pivotal factor, it becomes evident that an optimized image experience contributes significantly to building trust and authority among users, thereby fostering improved conversion rates. Moreover, the integration of Call-to-Action (CTA) buttons within the website architecture is crucial, serving as gateways to essential content and contact information while ensuring a seamless user journey. Within the realm of image optimization, attention to detail is paramount, encompassing both technical aspects such as file naming conventions and quality optimization, as well as accessibility considerations like alt text utilization. By adhering to best practices in alt text implementation, not only do we enhance search engine comprehension of image content, but we also prioritize inclusivity by aiding visually impaired users in understanding image context. Moreover, optimizing images around target keywords, both in file names and alt tags, not only aids in SEO efforts but also provides search engines with valuable context cues, ultimately contributing to improved search rankings. Thus, by amalgamating these practices, we can construct a digital environment where images serve as potent tools for both user engagement and search visibility.

Addressing keyword optimization strategies and internal linking practices

In the dynamic realm of SEO, optimizing keyword placement within website content holds paramount importance for enhancing search engine visibility and relevance. Google's algorithms prioritize the strategic placement of keywords, emphasizing their presence within the initial content segment. Incorporating the target keyword within the first 100 words aids in succinctly conveying the page's topical focus. Additionally, structuring the page effectively, including the keyword in elements like the title, H1 tag, and subtitles (H2-H6), reinforces its topical relevance and aids in comprehending the page's structure. Balancing keyword frequency is crucial; while excessive repetition should be avoided, moderate use, such as mentioning the keyword approximately 10 times, can instill trustworthiness in Google's eyes. Leveraging latent semantic indexing (LSI) keywords enriches content contextually, enhancing alignment with user search intents. Furthermore, a well-crafted internal linking strategy not only facilitates navigation but also distributes link equity, fortifying key pages' authority and amplifying SEO efforts. Synergizing keyword optimization and internal linking practices lays a robust foundation for sustained search engine visibility and relevance.

Strategic Implementation of On-Page SEO

As researchers delve into the realm of digital marketing strategies, the strategic implementation of on-page SEO emerges as a pivotal focus area. This multifaceted domain encompasses various approaches, alignment strategies, and practical recommendations aimed at optimizing web content to enhance visibility and relevance in search engine results. Below, we outline key sections that illuminate the intricacies of strategic on-page SEO implementation:

Approaches to strategic implementation of on-page SEO within digital marketing strategies

In this section, researchers dissect the diverse approaches employed in strategically integrating on-page SEO tactics within overarching digital marketing strategies. While acknowledging the significance of various on-page elements such as title optimization, meta description enhancement, URL structuring, and content optimization, researchers explore how these components synergize to amplify the online presence of businesses. By analyzing industry trends, algorithm updates, and consumer behavior patterns, researchers can identify optimal methodologies for enhancing on-page SEO effectiveness, ensuring that web content resonates with target audiences and aligns with overarching marketing objectives.

Alignment of on-page SEO techniques with business goals and target audience analysis

The researchers investigate the symbiotic relationship between on-page SEO techniques and overarching business objectives, emphasizing the critical role of target audience analysis in driving alignment. While exploring the intricacies of title optimization, meta description refinement, and URL structuring, researchers elucidate how these on-page elements contribute to enhancing brand visibility, driving organic traffic, and fostering user engagement. By leveraging demographic data, psychographic insights, and market segmentation strategies, researchers can tailor on-page SEO initiatives to resonate with specific consumer cohorts, ensuring that web content not only ranks prominently in search engine results but also cultivates meaningful interactions with prospective customers.

Practical tips and recommendations for integrating on-page SEO into website development and content creation processes

In this pragmatic segment, researchers distil actionable tips and recommendations for seamlessly integrating on-page SEO practices into website development and content creation workflows. Building upon established guidelines for title optimization, meta description enhancement, URL structuring, and content optimization, researchers offer practical insights into fostering user-centric design principles, enhancing page load speed, and optimizing multimedia content for search engine visibility. Moreover, researchers explore emerging trends such as voice search optimization and internal linking strategies, equipping practitioners with the necessary tools and

techniques to navigate the dynamic landscape of on-page SEO effectively.

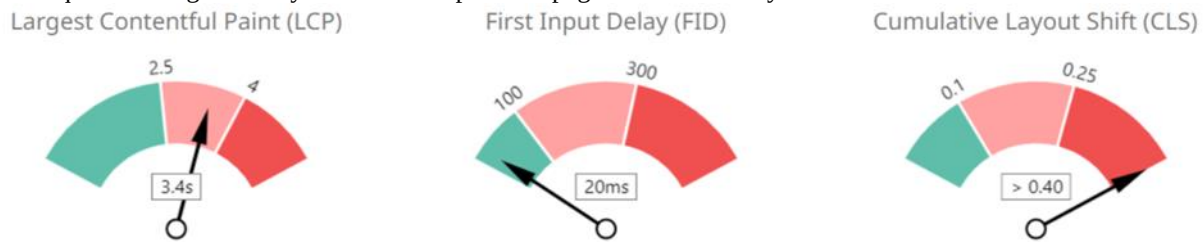


Figure 4: Page Load Speed

Source: Developed by Authors using Search Engine

Measuring On-Page SEO Success

Key performance indicators (KPIs) and metrics for evaluating the effectiveness of on-page SEO strategies

In assessing the efficacy of on-page SEO strategies, the identification and utilization of appropriate Key Performance Indicators (KPIs) and metrics are paramount. These measures serve as quantitative benchmarks to gauge the impact of various optimization efforts on website visibility, traffic, and ultimately, conversion rates. Commonly tracked KPIs encompass organic search traffic, keyword rankings, click-through rates (CTR), bounce rates, and time spent on page. Additionally, metrics like page load speed, mobile-friendliness, and content relevance are instrumental in evaluating the overall user experience and search engine accessibility. By diligently monitoring these indicators, researchers can discern the effectiveness of on-page SEO tactics, informing iterative improvements and ensuring alignment with overarching marketing objectives.

Tools and analytics platforms for tracking website performance, organic traffic, and keyword rankings

In the realm of digital analytics, an array of sophisticated tools and analytics platforms is indispensable for meticulously tracking website performance, organic traffic, and keyword rankings. These tools serve as the bedrock for informed decision-making in the dynamic landscape of online presence management. From Google Analytics, which offers comprehensive insights into visitor behavior and engagement metrics, to SEMrush and Ahrefs, renowned for their prowess in keyword research and competitive analysis, the toolkit available to researchers is vast and ever-expanding. Such platforms empower researchers to decipher the intricate nuances of user interactions, assess the efficacy of content strategies, and adapt marketing endeavours in real-time to maximize online visibility and ROI. Through leveraging these tools, researchers can unveil invaluable insights into audience preferences, industry trends, and competitor strategies, thus driving continuous optimization and strategic growth in the digital sphere.

Importance of data-driven decision-making and ongoing optimization efforts in on-page SEO

In contemporary digital landscapes, the significance of data-driven decision-making and continual optimization efforts in on-page SEO cannot be overstated. As a researcher in this field, it is evident that leveraging data analytics tools and methodologies empowers businesses to not only understand their audience better but also to tailor their on-page content in alignment with evolving search engine algorithms. By embracing data-driven approaches, organizations can pinpoint areas of improvement, identify high-impact keywords, and fine-tune meta tags, headings, and content structure to enhance search engine visibility and user engagement. Moreover, ongoing optimization endeavours ensure that web pages remain competitive in the dynamic realm of search engine rankings, fostering sustained organic traffic growth and maximizing the return on SEO investments.

Future Directions and Emerging Trends

Exploration of potential advancements and innovations in on-page SEO practices

In the realm of on-page SEO practices, the trajectory points towards a continued exploration of potential advancements and innovations. One key area of interest lies in the integration of artificial intelligence and machine learning algorithms to enhance content optimization strategies, enabling websites to better cater to user intent and search engine algorithms dynamically. Additionally, the emergence of voice search technologies necessitates a shift towards optimizing content for natural language queries and conversational interactions, signalling a paradigmatic change in keyword targeting and content structuring. Furthermore, as search engines increasingly prioritize user experience metrics, such as page speed and mobile-friendliness, there is a growing emphasis on technical optimization aspects like structured data implementation and responsive design. Moreover, the evolving landscape of search engine algorithms underscores the importance of staying abreast of updates and adapting strategies accordingly, highlighting the need for ongoing research and experimentation to stay ahead in the competitive digital ecosystem.

Anticipation of future trends in search engine algorithms and user behaviour

Anticipating future trends in search engine algorithms and user behavior presents an intriguing prospect for research and development. With advancements in artificial intelligence and machine learning, search engines are likely to evolve towards more personalized and contextually relevant results, catering to individual preferences and intent. The integration of natural language processing models may enable more conversational interactions with search engines, revolutionizing the way users query information. Additionally, the emergence of alternative search interfaces, such as voice and visual search, is expected to reshape the search landscape, offering users more intuitive and efficient ways to retrieve information. Furthermore, the increasing emphasis on privacy and data security is likely to influence the design of search algorithms, leading to a greater emphasis on user control and transparency in data usage. Understanding and adapting to these evolving trends will be crucial for researchers and practitioners alike, as they navigate the ever-changing dynamics of the digital information ecosystem.

Suggestions for further research and development to stay ahead in the dynamic field of on-page SEO and digital marketing

In navigating the evolving landscape of on-page SEO and digital marketing, future research endeavours should explore emerging trends to remain at the forefront of industry advancements. Investigating the implications of AI and machine learning algorithms on search engine ranking algorithms could provide valuable insights into optimizing on-page content. Additionally, delving into the integration of voice search and conversational AI presents an avenue for understanding how to adapt content strategies to meet evolving user behaviors. Moreover, examining the impact of emerging technologies such as augmented reality (AR) and virtual reality (VR) on user engagement and SEO performance could offer novel approaches for enhancing on-page experiences. Lastly, as search engines increasingly prioritize user experience metrics, research into website optimization techniques that prioritize speed, mobile-friendliness, and accessibility will be vital for maintaining competitiveness in the digital landscape.

Conclusion

Summary of key insights and findings from the article

In this comprehensive exploration of on-page SEO, we've uncovered fundamental principles and advanced techniques essential for optimizing web pages to rank higher and attract organic traffic. Rooted in the theoretical underpinnings of information retrieval and web usability, on-page SEO emphasizes concepts like keyword relevance, metadata optimization, and content quality. We've highlighted the significance of title, meta description, and URL optimization, as well as strategies for heading tags and content structure optimization. Additionally, we've discussed the importance of image optimization, keyword placement, and internal linking practices in enhancing search engine visibility and user engagement. Through practical implementation strategies and the measurement of success using key performance indicators and metrics, we've provided actionable insights for researchers and practitioners alike.

Emphasis on the significance of ethical on-page SEO practices for long-term success

Ethical on-page SEO practices are not only essential for adhering to search engine guidelines but also for fostering long-term success and credibility. By prioritizing user experience, relevance, and quality content, businesses can build trust with both search engines and users, leading to sustainable organic growth. Unethical tactics like keyword stuffing, cloaking, or link manipulation may yield short-term gains but can ultimately result in penalties and reputational damage. Therefore, emphasizing ethical on-page SEO practices is paramount for maintaining integrity and achieving enduring success in the digital landscape.

Reflection on future trends and opportunities in on-page SEO and digital marketing landscape

Looking ahead, the future of on-page SEO and digital marketing presents exciting opportunities and challenges. Advancements in artificial intelligence, voice search technology, and alternative search interfaces are poised to reshape the way users interact with search engines. Integrating these innovations into on-page SEO strategies will be crucial for staying ahead of the curve and meeting evolving user expectations. Moreover, ongoing research and development efforts should focus on understanding and adapting to emerging trends, such as augmented reality and virtual reality, to enhance user engagement and SEO performance. By embracing these future trends and opportunities, researchers and practitioners can remain agile and competitive in the dynamic field of on-page SEO and digital marketing.

Acknowledgment

This study was funded by the Rashtriya Uchchatar Shiksha Abhiyan, Alagappa University - Theme Based Research Project 2024 (RUSA ALU – TBRP 2024). The authors gratefully acknowledge the financial support of this initiative. Anand Bharathi S extends sincere thanks for the support provided through the Doctoral Fellowship, which has played a pivotal role in the development of this article.

References

- Aryani, D., Patirop, S.P.S., Setiawan, A. and Tjahjono, B. (2023).** 'Comparative analysis of on-page and off-page white hat search engine optimization (SEO) techniques on website popularity', *International Journal of Science, Technology & Management*, 4(3), pp. 527-533.
- Bhatia, S., Tuarob, S., Mitra, P. and Giles, C.L. (2011).** 'An algorithm search engine for software developers', in *Proceedings of the 3rd International Workshop on Search-Driven Development: Users, Infrastructure, Tools, and Evaluation*, pp. 13-16.
- Bilić, P. (2016).** 'Search algorithms, hidden labour and information control', *Big Data & Society*, 3(1), pp. 2053951716652159.
- Chelba, C., Hazen, T.J. and Saraclar, M. (2008).** 'Retrieval and browsing of spoken content', *IEEE Signal Processing Magazine*, 25(3), pp. 39-49.
- Chen, J.C. and Sénéchal, S. (2023).** 'The reciprocal relationship between search engine optimization (SEO) success and brand equity (BE): An analysis of SMEs', *European Business Review*, 35(5), pp. 860-873.
- Chotikitpat, K., Nilsook, P. and Sodsee, S. (2015).** 'Techniques for improving website rankings with search engine optimization (SEO)', *Advanced Science Letters*, 21(10), pp. 3219-3224.
- Craven, T.C. (2005).** 'Web authoring tools and meta tagging of page descriptions and keywords', *Online Information Review*, 29(2), pp. 129-138.
- Dearing, J.W. and Cox, J.G. (2018).** 'Diffusion of innovations theory, principles, and practice', *Health Affairs*, 37(2), pp. 183-190.
- Dewatmoko, S., Sonani, N. and Sudrajat, A.P. (2024).** 'Voice search SEO: Optimizing marketing strategies for the future', *Management Studies and Entrepreneurship Journal (MSEJ)*, 5(2), pp. 5054-5061.
- Gaikwad, M., Ahirrao, S., Phansalkar, S. and Kotecha, K. (2021).** 'Online extremism detection: A systematic literature review with emphasis on datasets, classification techniques, validation methods, and tools', *IEEE Access*, 9, pp. 48364-48404.
- Giromelakis, D. and Veglis, A. (2016).** 'Investigating search engine optimization factors in media websites: The case of Greece', *Digital Journalism*, 4(3), pp. 379-400.
- Granić, A. and Marangunić, N. (2019).** 'Technology acceptance model in educational context: A systematic literature review', *British Journal of Educational Technology*, 50(5), pp. 2572-2593.
- Haas, A. and Unkel, J. (2017).** 'Ranking versus reputation: Perception and effects of search result credibility', *Behaviour & Information Technology*, 36(12), pp. 1285-1298.
- Jain, A., Jain, C., Kargal, R.G. and Suresh, S. (2022).** 'Advancements and innovation in digital marketing and SEO', in *IoT and AI Technologies for Sustainable Living*. CRC Press, pp. 279-315.
- Jain, A., Jain, C., Kargal, R.G. and Suresh, S. (2022).** 'Advancements and innovation in digital marketing and SEO', in *IoT and AI Technologies for Sustainable Living*. CRC Press, pp. 279-315.
- Jiang, J., He, D. and Allan, J. (2014).** 'Searching, browsing, and clicking in a search session: Changes in user behavior by task and over time', in *Proceedings of the 37th International ACM SIGIR Conference on Research & Development in Information Retrieval*. pp. 607-616.
- Kelly, D. and Azzopardi, L. (2015).** 'How many results per page? A study of SERP size, search behavior and user experience', in *Proceedings of the 38th International ACM SIGIR Conference on Research and Development in Information Retrieval*. pp. 183-192.
- Killoran, J.B. (2013).** 'How to use search engine optimization techniques to increase website visibility', *IEEE Transactions on Professional Communication*, 56(1), pp. 50-66.
- Killoran, J.B. (2013).** 'How to use search engine optimization techniques to increase website visibility', *IEEE Transactions on Professional Communication*, 56(1), pp. 50-66.
- Kowalczyk, K. and Szandala, T. (2024).** 'Enhancing SEO in single-page web applications in contrast with multi-page applications', *IEEE Access*.

- Kritzing, W.T. and Weideman, M. (2013).** 'Search engine optimization and pay-per-click marketing strategies', *Journal of Organizational Computing and Electronic Commerce*, 23(3), pp. 273-286.
- Krrabaj, S., Baxhaku, F. and Sadrijaj, D. (2017).** 'Investigating search engine optimization techniques for effective ranking: A case study of an educational site', in *2017 6th Mediterranean Conference on Embedded Computing (MECO)*. IEEE, pp. 1-4.
- Kumar, N., Gupta, P. and Agarwal, S. (2014).** 'Search engine optimization: Is your website optimized with correct SEO techniques?', *International Journal for Research in Applied Science and Engineering Technology*, 2(6), pp. 2321-9653.
- Kumar, T. (2023).** 'Integration of intelligent AI & SEO: A review of various factors', *International Journal of New Media Studies: International Peer Reviewed Scholarly Indexed Journal*, 10(1), pp. 64-67.
- Lin, S.C., Tseng, H.T. and Shirazi, F. (2022).** 'Consumer decision journey for online group buying: Psychological and intentional procedure perspectives', *British Food Journal*, 124(12), pp. 4387-4405.
- Marangunić, N. and Granić, A. (2015).** 'Technology acceptance model: A literature review from 1986 to 2013', *Universal Access in the Information Society*, 14, pp. 81-95.
- Mladenović, D., Rajapakse, A., Kožuljević, N. and Shukla, Y. (2023).** 'Search engine optimization (SEO) for digital marketers: exploring determinants of online search visibility for blood bank service', *Online Information Review*, 47(4), pp. 661-679.
- Mohammadi, A.A. (2023).** 'SEO and other factors influencing small and medium-sized enterprises', *Onomázein*, 62(2023), pp. 2202-2211.
- Namoun, A., Alshanqiti, A., Chamudi, E. and Rahmon, M.A. (2020).** 'Web design scraping: Enabling factors, opportunities and research directions', in *2020 12th International Conference on Information Technology and Electrical Engineering (ICITEE)*. IEEE, pp. 104-109.
- Narayanan, D. and De Cremer, D. (2022).** "Google told me so!" On the bent testimony of search engine algorithms', *Philosophy & Technology*, 35(2), p. 22.
- Pabitha, C. and Sangeetha, G. (2014).** 'Refining SERP search engine result page for enhanced information retrieval', *International Journal of Web Technology*, 3(002), pp. 34-39.
- Pan, B. (2015).** 'The power of search engine ranking for tourist destinations', *Tourism Management*, 47, pp. 79-87.
- Patel, R.S., Chauhan, J.A., Patel, K.C. and Bhavsar, K. (2023).** 'Exploring the effectiveness of on-page SEO for webpage ranking: A critical study', in *International Conference on Advancements in Smart Computing and Information Security*. Cham: Springer Nature Switzerland, pp. 163-171.
- Rauniar, R., Rawski, G., Yang, J. and Johnson, B. (2014).** 'Technology acceptance model (TAM) and social media usage: An empirical study on Facebook', *Journal of Enterprise Information Management*, 27(1), pp. 6-30.
- Ravi, J., Yu, Z. and Shi, W. (2009).** 'A survey on dynamic web content generation and delivery techniques', *Journal of Network and Computer Applications*, 32(5), pp. 943-960.
- Roumeliotis, K.I. and Tselikas, N.D. (2023).** 'A machine learning Python-based search engine optimization audit software', *Informatics*, 10(3), p. 68.
- Rutz, O.J. and Bucklin, R.E. (2016).** 'Paid search advertising', in *Advanced Database Marketing*. Routledge, pp. 229-245.
- Sajed, T., Nourmohammadi, H.A. and Asadi, S. (2016).** 'Measuring keyword density of websites of MSRT universities' libraries', *Scientometrics Research Journal*, 2(1), pp. 1-26.
- Santos, S. and Gonçalves, H.M. (2021).** 'The consumer decision journey: A literature review of the foundational models and theories and a future perspective', *Technological Forecasting and Social Change*, 173, p. 121117.
- Sellamuthu, K., Ranjithkumar, S., Kavitha, K. and Gowtham, S. (2022).** 'On-page SEO techniques for better ranking in search engines', in *2022 8th International Conference on Smart Structures and Systems (ICSSS)*. IEEE, pp. 01-06.

- Strzelecki, A. and Rutecka, P. (2020).** 'Direct answers in Google search results', *IEEE Access*, 8, pp. 103642-103654.
- Van Looy, A. (2022).** 'Search engine optimization', in *Social Media Management: Using Social Media as a Business Instrument*. Cham: Springer International Publishing, pp. 125-146.
- Vila, T.D., González, E.A., Vila, N.A. and Brea, J.A.F. (2021).** 'Indicators of website features in the user experience of e-tourism search and metasearch engines', *Journal of Theoretical and Applied Electronic Commerce Research*, 16(1), pp. 18-36.
- Visser, E.B. and Weideman, M. (2014).** 'Fusing website usability and search engine optimization', *South African Journal of Information Management*, 16(1), pp. 1-9.
- Vollrath, M.D. and Villegas, S.G. (2022).** 'Avoiding digital marketing analytics myopia: Revisiting the customer decision journey as a strategic marketing framework', *Journal of Marketing Analytics*, pp. 1-8.
- Winter, P. and Alpar, P. (2020).** 'Effects of search engine advertising on user clicks, conversions, and basket choice', *Electronic Markets*, 30, pp. 837-862.
- Xiong, H., Payne, D. and Kinsella, S. (2016).** 'Peer effects in the diffusion of innovations: Theory and simulation', *Journal of Behavioral and Experimental Economics*, 63, pp. 1-13.
- Yang, Z. and Fang, X. (2004).** 'Online service quality dimensions and their relationships with satisfaction: A content analysis of customer reviews of securities brokerage services', *International Journal of Service Industry Management*, 15(3), pp. 302-326.
- Zhang, S. and Cabage, N. (2017).** 'Search engine optimization: Comparison of link building and social sharing', *Journal of Computer Information Systems*, 57(2), pp. 148-159.

Work Life Balance and Its Effect on Job & Life Satisfaction of Female Employees in Higher Education

Ms. Jyoti Dahinwal
Research Scholar
Indira Gandhi University,
Meerpur, UP, India

Dr. Jasvinder Singh
Assistant Professor, Indira
Gandhi University, Meerpur,
UP, India.

Ms. Neha Solanki
Research Scholar
Indira Gandhi University,
Meerpur, UP, India.

Abstract

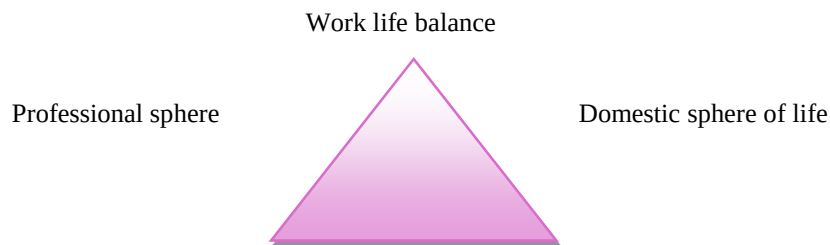
The key highlight of the present study was to examine the impact of work-life balance on job satisfaction & life satisfaction of female teachers working in college and universities in Haryana. Further the objective of the study to gain the conceptual understanding of work life balance, job satisfaction and life satisfaction. In the recent scenario to maintain a balance between work and non-work life is much important to satisfy oneself at job and in their overall life. Recently a survey with the help of hybrid mode of questionnaire, secondary source (books, magazine, journals & research papers) has been conducted on female university and college teachers of Haryana. Total number of samples was 292 where 29 were removed due to response biasedness and as they are filled by male teachers. A cross-sectional approach used by the researcher for data collection and the part of analysis was done on PLS SEM 4.0 software. The present research paper deepens our understanding of how much management is important between work and non-work to maintain a healthy level of satisfaction. Some individual efforts and organizational efforts like improvement and policies, providing the facility of flexible working hours, maternity benefits directly contributes both job and life satisfaction. Workplace can be adopting more equitable and inclusive work policies, improving diversity and gender sensitive policies to attract key position or top female talent. After diving into the literature or interpreting the results it was confirmed that WLB has a significant impact on Job Satisfaction and Life satisfaction on female employees. If one could be able to maintain a better sync between work and non-work responsibilities then overall satisfaction in life and at work can be enhanced. The study was conducted for a small period of time and analysis work done on a small sample size data. In this present study only female government & private university, college teachers of Haryana were included in future one could conduct this study on large data base including male and female employees.

Keywords – Work Life Balance (WLB), Job Satisfaction (JS), Life Satisfaction (LS), Work Stress, Work Life Policies.

Introduction

In past, in most of the developing countries only male member worked outside to fulfill the financial need of the household. For example in Joint Hindu families the role of male, female, younger and elder were clearly defined. Males have to earn money while female are only responsible to take care of the family. We all know that women are the most caring person on this universe in many roles like mother, sister, wives, friends etc but still they are treated as the weaker sex in the society (Bhushute, 2013). Throughout the history, life and work of women were basically integrated. Domestic activities of womenlike child & care of elders, social involvement and professional life happened together. Now a day's the role of women has been changed from house maker to working women. The boundaries of the four walls broken by females to fulfill their dreams, and the biggest reason behind this change was increasing quality of education and increasing living cost of human being. In recent time women are the sharp competitors of male (Sharma & Kumari, 2022). Women are following their passion in many fields but education sector is the priority of the females. In context of Indian job market, education sector emerged as the largest employer. At present, all the challenges are accepted by women and all the myths related with inferiority, weakness of women were proved wrong by the women's progress. In this global era women are everywhere whether it is position of CEO of the company, Mount Everest winner list, world of sports, medical field and many others (Chaturvedi & Maharshi, 2015). But it is quite obvious if women went outside for job, then she must have to manage her family responsibilities as well as professional life. Now the concept of work life balance plays an important role as work life balance is when an individual effectively able to share herself/himself for home and office responsibilities (Ganapathi, 2016; Garg, et al., 2023). It was clear from the literature that a well-managed personal and professional life creates many positive consequences whereas negative fit between the two may cause serious issues for individual employee as well as the organization also (Alqahtani, 2020). Even though, the concept of work life balance generally accepted, it is necessary to evaluate thoroughly its effect on life as well as job satisfaction in order to guide the employers and organizations in policy formulation. This becomes an evidence-based study towards improvement of work life balance and satisfaction among female teachers at university and college level.

Work Life Balance: The concept of work life balance is not new, earlier it was known as “work interference with family”. WLB is the balance between time & space of work, personal & professional life. If the women employees are satisfied or able to maintain a best fit between work and non-work then it become easy to balance personal life as well as social life. (Thilagavathi, & Selvan, 2020; Balamurugan et al., 2020). Definition of work life balance: “an equally satisfied level involvement of fit among the multiple roles in a person’s life” (Kornard&Mnagel, 2000; Alqahtani, 2020).



Job Satisfaction

Teachers are the most important factor in the education system. If the teacher is not satisfied, unwell physically and mentally, feeling exhausted and pressurized at the workplace then it will hamper their performance negatively. Teachers have to maintain a balance between work and personal sphere to improve living style, overall happiness (Shoba & Suganthi, 2020; Attar, Caglyyan& Kareem, 2020). Job satisfaction is the sense of an individual which he/she obtains by performing the job that attains all the expiations. Job satisfaction simply means how people feel about their job in various aspects or liking or disliking of their job (Singh, 2013). Job satisfaction: “saturated, happiest or positive emotional state which is an outcome of the appraisal of one’s job or job experiences” (Shoba & Suganthi, 2020).

Life Satisfaction

Life satisfaction, as the name indicates satisfaction and happiness related with overall life whether it is related with personal, professional, care of dependents etc.

Literature Review

Work life balance was not very new rather than it become important to manage in recent scenario because earlier women not participating outside home. Once they decided to work at home as well as office the concept become popular. Healthy work life balance improves mental health and wellbeing, job satisfaction among female employees but in certain case women employees are not able to manage their work and non-work life effectively. In a survey conducted in UK revealed maximum women was satisfied with their work and non-work life or in other words they are able to maintain a balanced work life balance because of their husband’s cooperation & support (Palanivelu & Mujeeb, 2019). Sharma & Kumari, (2022) collected data from 135 teachers from higher education to know their work life balance. In their study the authors concluded approximate 60% of the respondents recorded that their personal happiness hampered due to organizational stress whereas 40% respondents stated that they can’t perform well due to conflict in personal life. Conflicts affect work life balance at personal and professional life, they try to balance between work and non-work (Sharma & Kumari, 2022). It was suggested at organizational level to reduce work pressure, working hours, transportation & childcare facilities and medical facilities as well as medical facilities (Ganapathi, 2016; Sharma & Kumari, 2022). Ganapathi, 2016; Balamurugan & Sreeleka, (2020) confirmed positive relationship between job satisfaction and work life balance among private sector bank employees. Further they should formulate policies regarding prevention of sexual harassment, frequent health checkups etc. Conducted a case study by Memon, Shah & Shaikh, 2017 on female teachers and concluded married women face more problem in maintaining work life balance due to dual responsibility of work and office i.e., child or dependent care, support from family or spouse etc. The study also confirmed a positive association between work life balance and family & work satisfaction. One another important finding of the study was single working women mostly working in private schools facing more challenges like work and family pressure, childcare, home projects, checking fair copies etc. Rathee & Bhuntel, (2018) conducted a study on female teacher to know the factor affecting which creates hindrance in maintaining work life balance for female teachers. After analysis various factors concluded by the researchers like; time war between home and office responsibilities, commuting time, work pressure at home or office, attitude towards job, relationship between senior and subordinate etc. A healthy work environment needs to be created to maintain the balance between work and non-work by the employer at organizational level.

Work Life Balance & Job Satisfaction

Job satisfaction described multiple ways by researchers in a different context according to their study. Borah, (2012) described job satisfaction as a pleasurable emotional feeling of a particular individual whereas Gupta & Sethi, (2012) described job satisfaction is a reaction of any individual for their job. Further Borah, (2012) confirmed that if the individual showing positive emotional feeling, then he/she may satisfy with job and the satisfaction leads to increased productivity and healthy work life balance. In another study it was confirmed inverse relationship between WIPL (work interference with personal life), PLIW (personal life interaction with work) with teaching & job satisfaction while WPLE (work personal life enhancement) confirmed positive relationship with job & teaching satisfaction. Further the authors concluded that proper coordination is important to maintain the balance between personal and professional for better performance. If the employee was unable to maintain such balance than it leads to poor performance, poor work and non-work satisfaction and bad mental as well as physical health (Agah, Azmi & Irfan, 2017). A study was conducted in Saudi Arabian teachers to measure the effect of work family conflict, family work conflict and work life balance and its impact on job satisfaction. Results indicated direct relationship between work life balance and job satisfaction among higher education teachers (Alawi et al., 2021; Stankeviciene, Tamasevicius, & Diskiene, 2021). Shobha & Suganthi, (2020) summed up in their study, it was that type of the school doesn't affect the job satisfaction and work life balance of women teachers, while work life balance affect the overall satisfaction of life and job satisfaction or job performance. Happiness of the employee leads better performance while poor work life balance deteriorates happiness and satisfaction. Mercado, (2019) confirmed significant relationship between work life balance and job satisfaction. Hafeez, & Akbar, (2015) explored the relationship between work life balance and job satisfaction by taking various sub factors and concluded that work life balance does not have any impact on job satisfaction of schoolteachers.

Work Life Balance and Life Satisfaction

Among all teaching is the noblest and most respectable profession since ancient time to till date. But due to globalization, development of technology and most importantly use of technology in teaching made drastic changes at personal and professional level of the teachers. Out of all challenges one the most important challenge to maintain healthy work life balance at present. WLB is a multi-dimensional approach which allows the individual to establish smooth relationship at household and professional level (Gunnoo et al., 2024). An ideal fit between home and office/ school leads to healthy & happy living or overall satisfaction. Conflict related with work and non-work may cause stress among female employees. This kind of stress-free mind leads to satisfaction among female employees. A women employee pre occupied with work and family conflict cannot perform well at their workplace. (Hantrais & Walter, 1990; Gorsy & Panwar, 2016). Further, Gorsy & Panwar, (2016) conducted a study to explore the relationship between teacher's life satisfaction and work life balance and five factors of personality traits. Study confirmed personality traits correlated with life satisfaction and work life balance of teachers. School teachers are more able to maintain better work life balance as compared to college teachers.

Rationale of the Study

Till 1950, less number of women contributed their efforts in economic activities. One of the reasons behind this, most of the women was illiterate. A few sections of women were only doing job outside from home like nursing & teaching, others were occupied with household responsibilities. Gradually, by the drawn of 21st century the role of women was shifting from housewife to working women. At present women are playing active and equal role as man in every sector like teaching, engineering, spaceship, research & innovation etc (Singh, 2013). In the changing scenario families are also expecting from women not only to take responsibility of household chores, but also to pursue their interest & passion as their career. By studying the impact of work life balance on job satisfaction and life satisfaction of female teaching staff the researcher can be able to unfold the potential factors that affect work life balance, satisfaction of teachers. Further it will be helpful in formulating policies and practices to improve overall efficiency and satisfaction, ideal balance between work and personal life.

Proposed Model

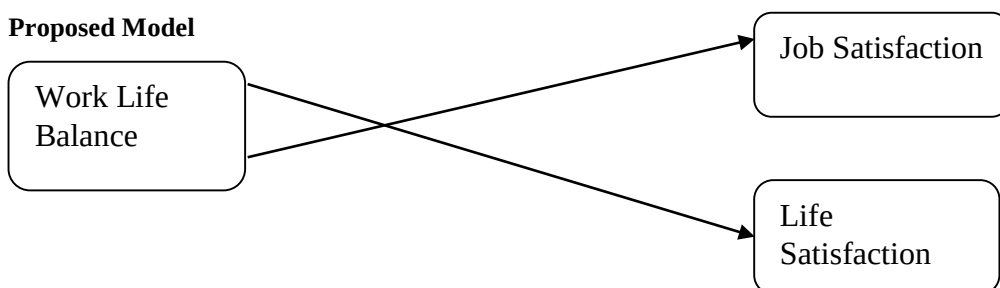


Fig1: Proposed model

Objectives of the Study

- To study the theoretical foundations & conceptual understanding related to work-life balance, job satisfaction & life satisfaction.
- To examine the impact of work life balance on job satisfaction of female teachers in University & Colleges.
- To investigate impact of work life balance on life satisfaction of female teachers in University & College.

Research Methodology

Participant and Procedure

Data was collected from the female teaching employees of government and private universities and colleges of Haryana. Total 292 responses were collected, 29 were removed due to response biased and as they were filled by male teachers. Data analysis segment was done with the help of Google form, excel, SPSS and Smart PLS SEM. Total 22 statements were selected from available literature on 5-point Likert scale extended as 1 to 5, where 1 represents strongly disagree and 5 as strongly agree.

Measures

5 point (1. Strongly disagree, 2. Disagree, 3. Neutral, 4. Agree and 5. Strongly Agree) Likert scale adopted to collect responses. Likert scale helps the respondents to answer freely (Costa, R., et al, 2020). PLS SEM is a predictive strategy that can deal with the multiple constructs, complex models as well as provides more flexibility on formative and reflective models. The study used a reflective model according to available standard scale. PLS SEM updates itself according to the need of the data.

The valid scale adapted from existing literature to measure work life balance, job satisfaction and life satisfaction. In this study WLB using 14 items (Yusuf, 2018; Smeltezer, 2016) Job satisfaction with 4 items (Irawanto, Novianti, & Roz, 2022; Schriesheim, Chester & Anne 1980) and Life satisfaction using 4 items (Kismono, Paramita, & Lintang, 2023). One statement from each was removed due to insufficient CR & AVE value (Ali et al., 2021). Only parsimonious, internally consistent items must be included (Thurston, 1947; Boatebg, et al., 2018).

Hypotheses

H1: WLB has significant impact on Job satisfaction of female teachers in college and university.

H2: Work life balance affects positively life satisfaction of female teachers in university and college.

Sample Size

Data was collected from May to September 2024 and received 292 responses. According to Hari et al. (2016) respondents should be 10 times of the greatest no. of predictor as per the model, according to this (22 statements) 220 respondents were sufficient to work with structured equation modeling. But for better and more reliable results we have collected 292 responses whereas 263 were finalized through personal interaction, google form, email etc.

Data Evaluation & Result Interpretation

The segment of data evaluation was done using SPSS & PLS SEM (Smart PLS 4.0). The objective behind this study was to understand the impact of WLB on Job satisfaction and Life satisfaction.

Respondent's Profile

Table-1: Descriptive Statistics

Measures	Items	Frequency	Percentage
Age (in years)	18-25	30	11.7
	26-35	112	42.9
	36-45	88	33.3
	Above 45	33	12.2
	Total	263	100
Family income	Below 5lakh	66	24.2
	5-7 lakh	16	6.3
	7-9 lakh	57	22
	Above 9	124	47.3
	Total	263	100
Marital Status	Married	159	60.5
	Unmarried	85	32.2

	Widow	19	7.3
	Total	263	100
Organization type	Govt.	116	43.9
	Private	106	40
	Semi govt.	41	15.1
	Total	263	100
Designation	Professor	68	25.8
	Associate Professor	36	13.7
	Assistant Professor	159	60.5
	Total	263	100

(Author's own Source)

Table 1 indicates the demographic information of the respondents. The major age group in the above table was 26-35, where most of them working as Assistant Professor in government sector. Maximum were married and their annual family income above 9 lakhs.

Measurement Model Evaluation

Table-2: Convergent Validity

Constructs	Items	Factor Loading	CA	AVE
JS	JS1	0.962	0.926	0.827
	JS2	0.957		
	JS3	0.947		
	JS4	0.754		
LS	LS1	0.791	0.739	0.557
	LS2	0.763		
	LS3	0.718		
	LS4	0.710		
WLB	WLB1	0.832	0.966	0.694
	WLB2	0.905		
	WLB3	0.868		
	WLB4	0.910		
	WLB5	0.828		
	WLB6	0.638		
	WLB7	0.899		
	WLB8	0.944		
	WLB9	0.800		
	WLB10	0.841		
	WLB11	0.893		
	WLB12	0.858		
	WLB13	0.676		
	WLB14	0.706		

Note. "WLB: work life balance, JS: job satisfaction, LS: life satisfaction", Source: PLS-SEM 4.0

The table summarize the result of factor analysis; WLB, JS & LS. Every corresponding construct having own measurement like LS1, LS2, LS3 & LS4. The term factor loading represents how strongly each item related to underlying constructs. Loading results near 1.0 indicate stronger relationship among variables. While CA Cronbach's alpha measures internal consistency, values near 1 indicating good reliability. In the above table JS has 0.926 CA value showing high reliability while WLB has excellent reliability which is 0.966. AVE measures the amount of variance captured by the constructs relative to the variance due to measurement error like higher value indicates constructs explains more than half of the variance and its items. For example WLB has AVE 0.694 representing good level of variance explained while 0.557 of LS showing slightly above acceptable level (Hair, et al, 2016; Hair et al, 2019; Kismono, Paramita, & Lintang, 2023).

Table-3: Validity and Construct Reliability

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
JS	0.926	0.928	0.950	0.827
LS	0.739	0.743	0.834	0.557
WLB	0.966	0.985	0.969	0.694

Source: PLS-SEM 4.0

Reliability as validity test generally used in SEM to assess the consistency and validity of the latent constructs like JS, LS and WLB. Cronbach's alpha measures internal consistency or how closely the items are related in a given set. It's a reliability coefficient where values range from 0 to 1, a higher value indicates better internal consistency. Job Satisfaction (0.926): showing very high value, indicating excellent internal consistency. Life Satisfaction (0.739) presenting moderate internal consistency. WLB (0.966) very high, reflecting excellent level of internal consistency (Hair et al., 2019). Composite reliability (rho_a) is another measure of reliability similar to above but often seen as more accurate for SEM. It takes into account different factor loadings like JS (0.928) indicating very high reliability, consistent with Cronbach's alpha. LS (0.743) moderate reliability, which is consistent with Cronbach's alpha. WLB (0.985) extremely high reliability (Hair et al., 2019). Composite reliability (rho_c) measures overall reliability of the latent constructs by considering both the loading of the individual items and the error term. It is similar to rho_a that focuses more on the reliability of the construct as a whole.

JS (0.950) here composite reliability measured excellent. LS (0.834) showing good reliability which indicates LS is a well measured construct. WLB (0.969) this one is the highest among all which showing strong reliability for the particular construct (Hair et al., 2019).

Average variance extracted (AVE) measures the level of variance captured by a construct compared to the variance due to measurement error. A higher value generally above 0.50 according to Hair et al, (2019) represents that the construct explains more variance than error. JS (0.827) indicating very high, means a substantial proportion of the variance in the indicators is explained by the constructs. LS (0.557) Moderate, but more than generally accepted limit of 0.50, which indicate adequate validity. WLB (0.694) High, showing that the indicators explain a good portion of the variance in WLB.

Overall WLB and JS representing very strong reliability and validity as reflected in Cronbach's alpha, Composite reliability and Average variance extracted (AVE). LS is moderate reliable and valid, as its Cronbach's alpha and composite reliability were lower but acceptable. In simple WLB and JS are highly reliable and valid while LS is moderately reliable but acceptable.

Table-4: Discriminant Validity using HTMT

	JS	LS	WLB
JS			
LS	1.033		
WLB	0.692	0.620	

Source: PLS-SEM 4.0

The above-mentioned table-4 represents the relationship between WLB, JS & LS.

LS-JS: represents strong positive relationship between the two. As the given value is 1.033 suggest LS is highly associated with JS, which means better satisfaction at job leads to higher satisfaction in overall satisfaction of life. WLB-JS indicates moderate positive relation between the two, the value 0.692 indicates better WLB associated with JS at workplace. WLB-LS (0.620): also showing moderate positive relationship between the WLB & LS (Kismono, Paramita, & Lintang, 2023).

Table-5: Discriminant Validity using FLC

	JS	LS	WLB
JS	0.909		
LS	0.866	0.746	
WLB	0.733	0.612	0.833

Source: PLS-SEM 4.0

The above table 5 provides correlation coefficient between the given constructs like WLB, JS and LS. According to Hair et al. (2019) Correlation values lie between -1 (Perfect negative) to +1 (Perfect positive) whereas 0 indicates no relationship among the variable. Generally above 0.70 considered Strong, 0.30 to 0.70 moderate and below 0.3 is weak JS (0.909) with itself indicating perfect correlation. JS & LS (0.866) indicates strong positive correlation between JS & LS which means employees who are satisfied with their job assumed to be satisfied with their lives

also. JS and WLB (0.733) also representing strong positive correlation which indicates employees with better work life balance tend to be more satisfied with their job. In short JS has a strong positive correlation between WLB & LS. Life satisfaction with itself (0.746) representing good internal consistency for LS. LS & WLB (0.612) reporting moderate positive correlation between WLN & LS. It shows those with better WLB generally more satisfied in their lives but the relationship is not stronger between JS and LS. In short LA has a moderate positive correlation with WLB. WLB with itself: 0.833 reporting perfect or near perfect correlation. Conclusively are positively related, recommending that improvement in WLB may improve in JS and LS as they are positively associated.

Structured Model Evaluation

The diagram which is shown below represents SEM or path diagram where in the above diagram circle represents latent variable and rectangle boxes represents observable variables with the latent variables. The arrow from latent variable to observable variable suggested a reflective model. Here three main variables Work life balance, Job satisfaction and Life satisfaction. The numeral values indicating the factor loading or in another words how strongly each observable variable is related to the latent variables. For example WLB 1 has a factor loading 0.832 and WLB 8 has 0.944 (highest) which means strong correlation with latent variables. The above given value 0.733 indicating the strength of the relationship between WLB & JS (strong positive correlation) between the two. Further the value 0.612 showing weak relationship between WLB & LS as compared to WLB & JS (Kismono, Paramita, & Lintang, 2023).

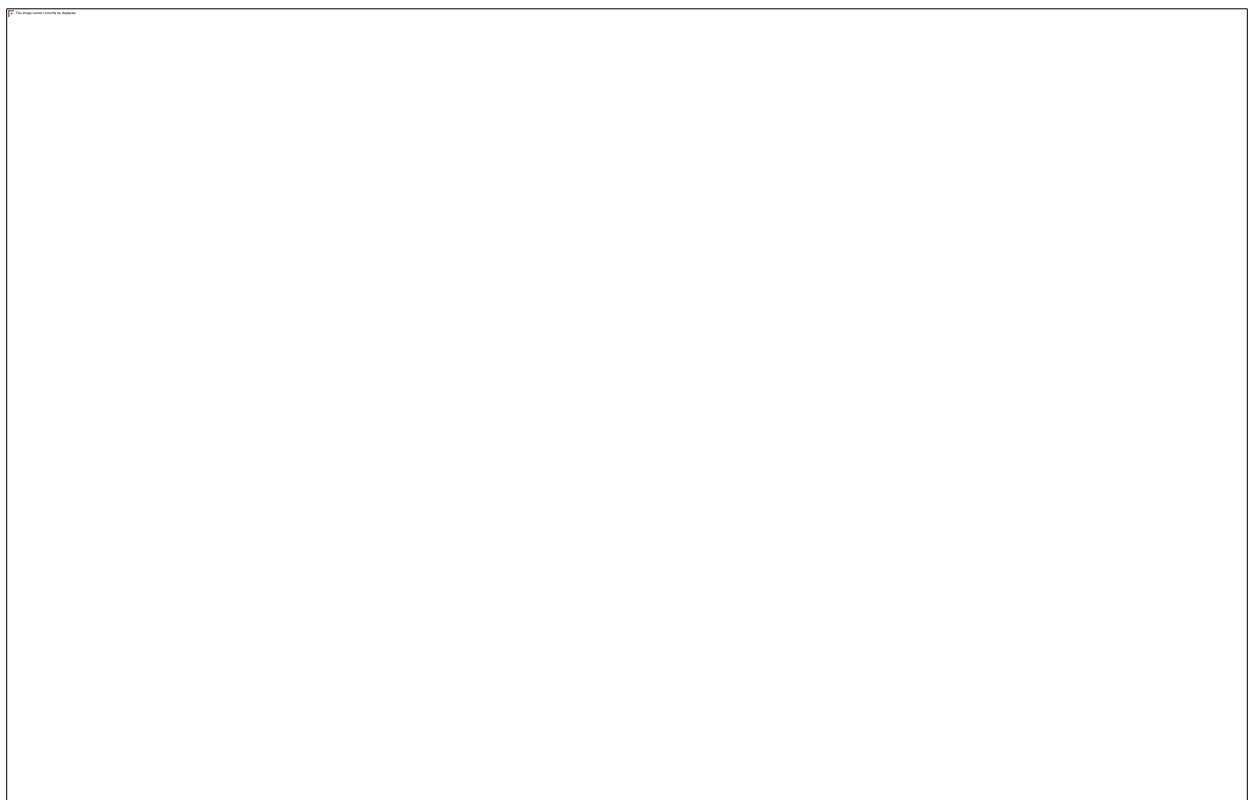


Fig 2: Structured Model Evaluation (using PLS-SEM 4.0)

Table-6: Coefficient of determination R^2 & Q^2

Latent	Q^2 Predict	R-square	R-square adjusted
JS	0.531	0.537	0.535
LS	0.364	0.374	0.372

Source: PLS-SEM 4.0

In the research paper coefficient of determination or R square defines the variance proportion in the dependent variable by independent variable. Coefficient of determination (R^2) considered moderate if it is near 0.50 (Henseler et al., 2009; Hair et al., 2019).

Table-7: Hypothesis Testing

Hypotheses	Paths	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Decision
H1	WLB -> JS	0.733	0.737	0.024	31.144	0.000	Supported
H2	WLB -> LS	0.612	0.620	0.035	17.691	0.000	Supported

Source: PLS-SEM 4.0

Original sample (O): represents original estimated path coefficient from the model which indicates the strength and direction of the relationship between independent and dependent variables. Samples mean (M) mean path coefficient from bootstrapped samples which is used to estimate the stability of the path coefficient.

Standard deviation (STDEV) variability of the coefficient across different samples can be measured. A smaller ST Dev suggests more stability in relationship. T statistics ($|O/STDEV|$) are calculated by dividing the original path coefficient (O) by the standard Deviation which indicates the effect is significantly different from zero. The larger the results indicate more significant relationship. P value helps to determine the significance of the results. Below 0.05 p value indicates that the relationship between the variables is significant.

Decision: as the name indicates it is the column which indicates whether the hypothesis is supported or not. According to Kock, (2016) if the p value is less than 0.05 then the hypothesis is generally accepted. After the analysis H1 & H2 are accepted.

Table-8: F Square Value

	f-square
WLB -> JS	1.159
WLB -> LS	0.598

Source: PLS-SEM 4.0

The above table 8 generally used in PLS SEM to represents the effect size of predictor variable on an outcome where given values help to measure the strength of relationship between independent variable and dependent variable. The value 1.159 considered large F square which means WLB strongly affects JS while value 0.598 represents moderate to large effect, indicates substantial influence of WLB on LS (Hair et al. 2019). VIF value/ F square value below 3, which means no multicollinearity is there. VIF value between 3 to 5 shows low to moderate multicollinearity problem (Hair et al., 2016).

The table explains the relationship between three variables like WLB, JS & LS. The diagonal element like JS-JS, LS-LS and WLB-WLB are not showed or we can assume to be 1 (In many case they represents the correlation between each other). The value 1.159 (WLB-JS) indicates a positive relation between WLB & JS which means higher work balance leads to higher job satisfaction. The second value 0.598 (WLB-LS) represents moderate positive correlation between WLB and Life satisfaction.

Research Implications

Some theoretical and practical implications are like:

- Gender specific work life model earlier it was considered gender neutral perspective while in present time it needs more nuanced model that consider the unique challenges female employees face such as family and professional responsibility, care giving responsibility and gender bias workplace.
- Inter sectionalist: Future studies should account for the inter sectionality like how race, identity factor that affects female employees work life balance which leads to development more inclusive theories.
- HR policies and gender sensitivity: some policies like flexible working hours, childcare support, better meet the needs of females can boost the retention and satisfaction.
- Management and leadership: Leadership plays key role in maintenance of female employees work life balance. Future studies can pay attention to check the impact of management style and role of supervision in fostering a work culture that can help in improving better work life balance.

Conclusion

At present females are participating largely at every field whether it is education, research, astronomy, corporate etc. Organizations are continuously paying attention towards improving employees experience towards higher job satisfaction, reduced stress and wellbeing. The relationship between work life balance and satisfaction is

positive. The result of the present study and the supporting literature showed that a better work life balance helps in improving satisfaction regarding job and in overall life. The employees, who make oneself able to manage the responsibility of workplace and household, become more confident, more satisfied and more balanced (Jain et al., 2024). Further a satisfied employee can work towards higher productivity and better work place adjustment. A positive WLB allows a female to meet both professional and personal goals, reducing burnout, stress related to home and office and better health and wellbeing. It does not lead only satisfaction but can helps in greater loyalty and positive motivation. On the opposite side poor work life balance deteriorate work motivation, lower job satisfaction, lower employee retention rate, emotional exhaustion which negatively impact overall performance of employees. Overall there is inter connection between WLB, JS & LS, those who can manage their home and work responsibilities feel satisfied at job and life also.

Guidelines for Upcoming Research

Modern organizations especially, education sector must address issues related to work life balance. A holistic approach need to be designed in support of female teaching staff (Palanivelu& Mujeeb, 2019). Policies like flexible working hours, flexible work approach, family friendly benefits, initiatives to improve work life balance and health & wellbeing of employees should be initiated by the organizations. (Agah, Azmi & Irfan, 2017). Effective work life balance practices and policies build cooperative, healthy and happy work culture at organizational level (Ojo, et al, 2014). Organizing must schedule frequent counseling session, regular health checkups, arrangements of yoga classes, appreciation for the small achievements to motivate then and create inculcate the feeling of love, belongingness at work place may be suggested to maintain a balance between personal and professional life (Rathee, & Bhuntel, 2018; Shobha, & Suganthi, 2020). Conducting time management workshops and job-related training by the school authority frequently to reduce work stress among teachers.

One of the most trending solutions is flexi time work arrangements, it is true that it's not easy to adopt these kinds of work arrangements in schools but not impossible because some of the private institutes have been adopted the same (Shobha, & Suganthi, 2020).

References

- Agah, K., Azmi, F.T. & Irfan, A., (2017).** Work life balance and job satisfaction: An empirical study focusing on higher education teachers in Oman. *International journal of social science and humanity: Sultanate of Oman*, pp.165- 171.
- Alawi, A., Saffar, E., Saleh, Z., Alotaibi, H., & Al-Alwai., (2021).** A study of the effects of work-family conflict, family-work conflict, and work-life balance on Saudi female teachers' performance in the public education sector with job satisfaction as a moderator. *Journal of International Women's Studies: Saudi Arabia*, 22 (1), pp. 486 - 503.
- Ali, S., Yusop, Z., Kaliappan, S., Chin, L., & Meo, M., (2021).** Impact of trade openness, human capital, public expenditure and institutional performance on unemployment evidence from OIC countries. *International journal of manpower: OIC*, <https://doi.org/10.1108/IJM-10-2020-0488>.
- Alqahtani, T., (2020).** Work life balance of women employees. *Granite journal: Aberdeen*, pp. 37-42.
- Attar, M., Caghyan, V., & Kareem, A., (2020),** Evaluating the moderating role of work life balance on the effect of job stress on job satisfaction. *Istanbul business research: Istanbul*, pp. 201-223.
- Balamurugan, D., & Sreeleka, M., (2020).** A study on work life balance of women employees in IT sector. *International journal of engineering technological and management research*: pp. 64- 73.
- Bhuskute, S. B., (2013),** A Study of Work Life Balance of Female Teaching Professional in Pune. *Administration Tomorrow: Pune*, pp. 06-11.
- Boatebg, G., Neilands, T., Frongillo, E., Quinonez, H., & Young, S., (2018).** Best practices for developing and validating scale for health, Social and Behavioral research: A primer. *Frontier in public health: USA*, pp. 1-18.
- Borah, S., (2012).** Employee Job Satisfaction: A Case Study on the Pipeline Department of Oil India Limited. *Prabandhan Indian Journal of Management: India*, pp. 32-36.
- Chaturvedi, R., & Maharshi, N., (2015).** A study of factors affecting work life balance of women employees working in public and private sector bank in Rajasthan. *Asia Pacific journal of management & entrepreneurship research: India*, pp. 93- 107.
- Costa, R., et al., (2020).** The work life balance and job satisfaction. *International journal of services and operation management*, pp. 2-26.
- Dreher, G., (2003).** The effect of work-life programs on female leadership at the top: *Human Relations*, pp. 541-560.
- Ganpati, R., (2016).** A study on work life balance and job satisfaction of women employees working in new private sector banks, *Journal of management research: India*, pp. 126-130.
- Garg, R., et al. (2023).** Assessing the impact of work life balance on employee performance and job satisfaction, *Eur. Chem. Bulletin*: pp. 718-726.
- Gorsy, C., & Panwar, N., (2016).** Work life balance, life satisfaction and personality traits among teaching professionals. *International Journal in Management and Social Science: India*, pp. 98- 104.
- Gunnoo, L., & Mungrah, K., (2024).** Glass Ceiling: A Study of Women in Senior Management Roles within the Mauritian Banking Sector. *South Asian Journal of Management Research: Mauritius* pp. 1-16.
- Gupta, A., & Sethi, J.A., (2012).** Impact of Quality of Work Life on Employees Perceived Performance, Job Satisfaction and Employee Commitment. *Global Journal of Management and Research*, Issue: Sri Lanka Oct-Dec 2012, pp. 56-70.
- Hafeez, U., & Akbar, W., (2015).** Impact of work life balance on job satisfaction among school teachers of 21st century. *Australian journal of business and management research: Pakistan*, pp. 25- 37.
- Hair, J., Risher, J., Marko, S., & Ringle, C., (2019),** when to use and how to report the result of PLS –SEM. *European business review*: pp. 2-24.

Hair, J.F., Sarstedt, M Ringle, C.M., (2017). Advanced issues in partial least square structural equation modeling: Thousand Oaks, CA: SAGE Publication

Hantrais, L., & Walters, P., (1990). Gender Relations and Employment. The British Journal of Sociology: USA, pp. 329-349.

Hensler, J., Ringle, C.M., & Sinkovic, R. R., (2009). The use of partial least square path modeling in international marketin. Advance in international marketing: pp. 277-319.
<http://doi.org/10.1016/j.jclepro.2022.134857>.

Irawanto, D., Novianti, K., & Roz, K., (2022). Work from home: Measuring satisfaction between work life balance and work stress during the COVID 19 pandemic in Indonesia. Economics: Indonesia, pp. 96.

Jain, S., & Mahapatra, M., (2024). Impact of Workplace Ostracism on Organizational Culture among Academicians in ED Tech Startups: A Comprehensive Analysis. South Asian Journal of Management Research, pp. 116-124.

Kamau, J., et al. (2013). Work life balance practices on employee performance of Ecobank Kenya. European journal business and management: Kenya, pp. 179-185.

Kismono, G., Paramita, W., & Lintang, G., (2023). Can acceptance promote life satisfaction during a work from home regime? The mediating role of work life balance and job stress. Cogent business and management: Indonesia, pp. 1-16. <https://doi.org/10.1080/23311975.2023.2234130>.

Kock, N., (2016). Hypothesis testing with confidence interval and p values in PLS SEM. International journal of e collaboration, pp. 1-6.

Konard, A., & Mnagel, R. (2000). The impact of work-life programs on firm productivity. Strategic Management Journal: USA, 1225-1235.

Memon, A., Shah, A., & Shaikh, F., (2017). Work life balance of working women in education sector: A case study of Naushahro Feroze and Mirpurkhas: Case study journal, pp. 28- 46.

Mercado, J., (2019). Work Life Balance and Level of Satisfaction among Women teacher assigned in the Northern most part of Province of Surigao Del Sur, Phillipines. The South East Journal of Management: Phillipines, pp. 141-149.

Noor, K., (2011). Work life balance and intention to leave among academics in Malaysia public higher education institutes. International journal of business and social science: Malaysia, pp. 240-248.

Ojo, I., Falola, H., & Mordi, C., (2014). Work life balance policies and practices: A case study of Nigerian female university students: European Journal of Business and Management: Nigeria, pp. 184-193.

Palanivelu, V.P. & Mujeeb., (2019). A study of women works life balance in education field: International journal of research in humanities, arts and literature: India, pp. 292-297.

Rathee, R., & Bhuntel, R., (2018). Factors affecting work life balance of women in education sector. International journal of social science and economic research: India, pp. 831- 857.

Scherriesheim, Chester & Anne S., (1980). Development and validation of a short satisfaction Instrument for use in survey feedback interventions. Western academy of management meeting: pp. 115-117.

Sharma, S., & Kumari, N., (2022). A study of work life balance of women educators working in higher education. International journal of food and nutritional sciences: India, pp. 2225- 2231.

Shobha, D., & Suganthi, G., (2020), Work life balance and job satisfaction- An empirical analysis using structural equation modeling. International Journal of Advanced Science and Technology: India, pp. 1265-1272.

Silban, H., & Margaretha, M., (2022). Impact of work life balance towards job satisfaction and employee retention: Study of millennial employees in Bandung city, Indonesia: International journal of innovation and economic development, pp. 18-26.

Singh, S., (2013). Work life balance: A literature review. Global journal of commerce & management perspective: India, pp. 84-91.

Smeltzer, S., Cantrell, M., hopko, N., & Haverly, M., (2016). Psychometric analysis of the work life balance self-assessment scale. *Journal of Nursing Measurement: Pennsylvania*, pp. 5-14.

Stankeviciene, A., Tamasevicius, V., & Diskiene, D., (2021). The mediating effect of work life balance on the relationship between work culture and employee's wellbeing. *Journal of business economics and management: Lithuania*, pp. 989-1007.

Thilagavathi, M., & Selvan, M., (2020). Work life balance of women teachers in private higher secondary schools: *Cikitusi journal for multidisciplinary research*, pp. 268-272

Thurston, L., (1947). Multiple factor analysis. *Psychological review*, pp. 406-427.

Yusuf, S., (2018). Comparative study of work life balances and job satisfaction of employees working in business process outsourcing sector. *International journal of management & social science: India*, pp. 87-93.

Impact of Visual Merchandising and Store Atmospheric on the Impulsive Buying Of Customers in Salem District

Mrs. P. Rajeswari

Research Scholar, Sri Balamurugan Arts and Science College Sathappadi, Mecheri, Mettur, Salem, Tamil Nadu, India.

Dr. T. Ragunathan

Principal, Sri Balamurugan Arts and Science College, Sathappadi, Mecheri, Mettur, Salem, Tamil Nadu, India

Abstract

The customers visiting retail stores purchase goods as per the pre-prepared or pre-planned list. At times, the customers tend to buy certain other goods on the sudden effect of visual merchandising and store atmospheric. Therefore, the retailers adopt these strategies for attracting the customers and increase the sales. The visual merchandising is also helpful in establishing the store image. The present study has analyzed the influence made by visual merchandising and store atmospheric on the impulsive buying behaviour of the customers. The study has been conducted among the customers of the retail stores in Salem District. Primary data collected from the sample respondents have been analyzed with appropriate statistical tools. The results have highlighted that among the demographic variables, age, gender and organizational status have significantly influenced the impulsive buying while marital status, educational level, monthly income, size of family and frequency of visit have no significant impact on the impulsive buying. It is found that the assortment has attracted the customers more to involve in impulsive buying. Colour and music have been reported to be the factors contributing to the impulsive buying more than the other store atmospheric factors. The researchers have offered suggestions for enhancing the impulsive buying behaviour of the customers by making the visual merchandising peppy and trendy.

Keywords – Visual Merchandising; Store Atmospheric; Impulsive Buying; Impact and Customers.

Introduction

Retailers adopt several strategies from time to time with a view to attract the customers. At once a customer enters into a retail store; his attention is drawn by the visual merchandising and store atmospheric. Visual merchandising guides the customer to know the product information. It helps to understand the new arrivals and their features. Window display is a part of the visual merchandising which displays the products and customer can easily identify the products and brands. Store front elevation and ambience inspire the customers who step into the retail store even if they have no purchase intention. Store atmospheric include the layout, lighting, music and scent which provide a pleasant shopping experience to the customers. The fragrance and aroma inside the store and the light music played keep the customers to stay in the store for long hours. During their prolonged stay in the store they visit each and every section of the store and buy the products. Even though the customers have visited the store with a pre planned list of goods to be purchased the visual merchandising persuades them make unplanned purchases also. The purchase decision of certain goods is made by the customers instantly on seeing the display. It is known as impulsive buying.

Review of Literature

Randiwela, P. & Wanninayake, W.M.C.B. (2007) found that impact of visual merchandising played a vital role in deciding the store. The proportion of customers strongly influenced by cleanliness was greater than that of design layout and product display but less than the proportion of customers strongly influenced by lighting. It reveals that the selection of store by the customer is determined by visual merchandising and lighting more than any other factor. The researchers have recommended that providing attractive visual merchandising materials would increase the visit of customers. **Nair, G.K. & Meesala, A. (2014)** identified that store environment and shopping comfort have made a significant impact on the satisfaction of the customers. There was a negative relationship observed between store image and customer satisfaction. It indicates that the store has not fulfilled the expectations of the customers in terms of store image. The determinants of repurchase intention included store environment, shopping comfort and merchandise assortment. Cross purchase was attributed to the store atmosphere while store loyalty was influenced by shopping comfort and store layout. **Hussain, R. & Ali, M. (2015)** examined the impact of atmospheric of the store on the purchase intention of the consumers. The results of regression analysis revealed that the impact of cleanliness, scent and lighting on purchase intention was significant while music, temperature and colour did not have any significant impact on the purchase intention of the consumers. However, significant influence was made by display and layout on the purchase intention. **Singh, N. & Mhatre, G. (2016)** have observed that most of the customers visit the stores once in a week. They want go for shopping at the week-ends. Among the window display components, product display and graphics were the attracting features in accordance with the customers. Size of the store was not found to have any significant

impact on the store choice of the customers. The authors have agreed that in-store lighting and music have enhanced the shopping experience of the customers.

Statement of the Problem

A thorough review of previous literature indicates that many studies have been conducted on visual merchandising. These studies have focussed on the role of visual merchandising in store selection and purchase decision making. The impact of visual merchandising on the satisfaction of the customers has been studied by many scholars while the relationship between store atmospherics and satisfaction has been examined in certain other studies. The impact of store image on the purchase intention and satisfaction has been discussed by previous scholars in their studies. The effect of window display on the customer shopping experience and satisfaction has been analyzed by certain researchers. However, it is found that the existing literature has a little exploration on the impulsive buying behaviour of the customers as influenced by visual merchandising and store atmospherics. Hence, the present study has been undertaken.

Objectives of the Study

The following are the objectives of the present study:

- To analyze the level of impulsive buying of the customers at the retail stores in Salem District
- To examine the impact of visual merchandising on the impulsive buying behaviour of the customers in Salem District and
- To investigate the effect of store atmospherics on the impulsive buying behaviour of the customers in Salem District.

Scope of the Study

The present study aims at describing the views of the customers in Salem District about the visual merchandising. It discusses the impact of visual merchandising strategies adopted by the retail stores in Salem District on the impulsive buying behaviour of the customers. A detailed analysis is conducted about the influence of store atmospherics on the impulsive buying behaviour of the customers in Salem District.

Research Methodology

This study has adopted the descriptive method as well as exploratory research method. It describes the demographic variables of the selected respondents and explores their opinion about the visual merchandising and store atmospherics along with their impact on impulsive buying behaviour. The study has been undertaken with the primary data collected from 150 sample respondents using a structured questionnaire. The respondents were selected based on convenient sampling method. The data collected have been analyzed using percentage analysis, mean, standard deviation, chi square test, ANOVA and multiple regression analysis.

Analysis and Interpretation

The data collected from the sample respondents have been grouped and regrouped for the purpose of analysis. The analysis made in this paper includes analysis of demographic variables, levels of visual merchandising and impact of visual merchandising and store atmospherics on impulsive buying of the customers. The demographic variables such as gender, age, marital status, educational level, occupational status, monthly income and size of family have been analyzed using percentage analysis. These variables are compared with the impulsive buying behaviour of the customers. In this regard, impulsive buying behaviour has been classified as never, sometimes and always. The responses given by the sample respondents have been compared with the demographic variables in order to test whether there is any significant association between demographic variables and impulsive buying behaviour by testing the following hypotheses:

Null Hypothesis H_0 : There is no significant association between demographic variables and impulsive buying behaviour of the customers

Alternative Hypothesis H_1 : There is a significant association between demographic variables and impulsive buying behaviour of the customers.

Table-1: Gender and Impulsive Buying

Gender	Frequency	Never	Sometimes	Always	Total
Male	No.	11	38	19	68
	%	16.20%	55.90%	27.90%	100.00%
Female	No.	21	23	38	82
	%	25.60%	28.00%	46.30%	100.00%
Total	No.	32	61	57	150
	%	21.30%	40.70%	38.00%	100.00%

According to the Table 1, among the male customers, 55.9 per cent of them have made impulsive buying of products sometimes and 16.2 per cent of them have never made impulsive buying. On the other hand, 46.3 per cent of the female customers have always been making impulsive buying whereas 25.6 per cent of them have never made unplanned purchases. It denotes that impulsive buying behaviour is always found among the female customers more than the male customers.

Table 2: Age and Impulsive Buying

Age	Frequency	Never	Sometimes	Always	Total
Up to 20 years	No.	12	8	4	24
	%	50.00%	33.30%	16.70%	100.00%
21 to 30 years	No.	9	33	25	67
	%	13.40%	49.30%	37.30%	100.00%
31 to 40 years	No.	5	11	13	29
	%	17.20%	37.90%	44.80%	100.00%
Above 40 years	No.	6	9	15	30
	%	20.00%	30.00%	50.00%	100.00%
Total	No.	32	61	57	150
	%	21.30%	40.70%	38.00%	100.00%

From the Table 2, it could be understood that 50 per cent of the customers in the age group of up to 20 years have never made impulse purchases while 49.3 per cent of the customers in the age group of 21 to 30 years made it sometimes. On the other hand, 44.8 per cent of the customers pertaining to the age group of 31 to 40 years and 50 per cent of the customers above 40 years of age stated that they have always been making impulsive buying. It denotes that as the age increases, the impulsive buying behaviour of the customers also increases.

Table 3: Marital Status and Impulsive Buying

Marital Status	Frequency	Never	Sometimes	Always	Total
Married	No.	18	42	32	92
	%	19.60%	45.70%	34.80%	100.00%
Unmarried	No.	14	19	25	58
	%	24.10%	32.80%	43.10%	100.00%
Total	No.	32	61	57	150
	%	21.30%	40.70%	38.00%	100.00%

Table 3 divulges that 45.7 per cent of the married customers made impulse purchases sometimes while 43.1 per cent of the unmarried customers were making impulsive purchases always. The proportions of married and unmarried customers never made impulsive purchases were the least among the respective groups of customers. It implies that impulsive buying behaviour is found more among the unmarried customers than the married customers.

Table 4: Educational Level and Impulsive Buying

Educational Level	Frequency	Never	Sometimes	Always	Total
Illiterate	No.	2	3	2	7
	%	28.60%	42.90%	28.60%	100.00%
School Level	No.	9	31	21	61
	%	14.80%	50.80%	34.40%	100.00%
UG	No.	13	16	22	51
	%	25.50%	31.40%	43.10%	100.00%
PG	No.	6	8	10	24
	%	25.00%	33.30%	41.70%	100.00%
Others	No.	2	3	2	7
	%	28.60%	42.90%	28.60%	100.00%
Total	No.	32	61	57	150
	%	21.30%	40.70%	38.00%	100.00%

It is proclaimed from the Table 4 that impulsive buying behaviour is always found among 28.6 per cent of the illiterate customers; 34.4 per cent of the customers with school level education; and 43.1 per cent of the customers with UG level educational qualification. It is stated by 41.7 per cent of the post graduate customers and 28.6 per cent of the customers other educational qualifications that they have always involved in impulsive buying. It reveals that the UG and PG level educated customers made more impulsive buying than the other customers.

Table-5: Occupational Status and Impulsive Buying

Occupational Status	Frequency	Never	Sometimes	Always	Total
Agriculture	No.	6	11	5	22
	%	27.30%	50.00%	22.70%	100.00%
Business/ Profession	No.	6	30	24	60
	%	10.00%	50.00%	40.00%	100.00%
Employed	No.	14	14	14	42
	%	33.30%	33.30%	33.40%	100.00%
Others	No.	6	6	14	26
	%	23.10%	23.10%	53.80%	100.00%
Total	No.	32	61	57	150
	%	21.30%	40.70%	38.00%	100.00%

According to the Table 5, impulsive buying behaviour was found sometimes among 50 per cent each of the agriculturists and businessmen/professionals whereas the impulsive buying behaviour was found always among 22.7 per cent of the agriculturists and 40 per cent of the businessmen/professionals. There was no difference among the employees regarding the impulsive buying behaviour. On the other hand, 53.8 per cent of the customers engaged in other occupations have involved always in impulsive buying. It denotes that the impulsive buying was found greater among businessmen/professionals and others.

Table-6: Monthly Income and Impulsive Buying

Monthly Income	Frequency	Never	Sometimes	Always	Total
Up to Rs. 10000	No.	4	5	5	14
	%	28.60%	35.70%	35.70%	100.00%
Rs.10001 to Rs.20000	No.	9	15	14	38
	%	23.70%	39.50%	36.80%	100.00%
Rs.20001 to Rs.30000	No.	11	24	23	58

	%	19.00%	41.40%	39.70%	100.00%
Above Rs.30000	No.	8	17	15	40
	%	20.00%	42.50%	37.50%	100.00%
Total	No.	32	61	57	150
	%	21.30%	40.70%	38.00%	100.00%

It could be learned from the Table 6 that 35.7 per cent of the customers earning a monthly income up to Rs.10000 as well as 39.5 per cent of the customers in the monthly income group of Rs.10001 to Rs.20000 have been making impulsive buying sometimes. Impulsive buying behaviour was found sometimes among 42.5 per cent of the customers having monthly income above Rs.30000. The proportion of customers never involved in impulsive buying was found greater among the customers with monthly income up to Rs.10000. It denotes that the low income customers did not involve in impulsive buying behaviour as the other customers.

Table-7: Size of Family and Impulsive Buying

Size of family	Frequency	Never	Sometimes	Always	Total
Up to 2	No.	3	5	6	14
	%	21.40%	35.70%	42.90%	100.00%
3 to 4	No.	16	33	31	80
	%	20.00%	41.30%	38.80%	100.00%
More than 4	No.	13	23	20	56
	%	23.20%	41.10%	35.70%	100.00%
Total	No.	32	61	57	150
	%	21.30%	40.70%	38.00%	100.00%

From the Table 7, it is divulged that 42.9 per cent of the customers having a size of family up to 2 members have always been involved in impulsive buying while 41.3 per cent of the customers pertaining to the size of family of 3 to 4 stated that they have impulsive buying behaviour sometimes only while the same statement was given by 41.1 per cent of the customers belonging to the size of family of more than 4 members. It implies that impulsive buying behaviour is found more among the small family members.

Table-8: Frequency of Visit And Impulsive Buying

Frequency of visit to the store	Frequency	Never	Sometimes	Always	Total
Monthly once	No.	7	22	16	45
	%	15.60%	48.90%	35.60%	100.00%
Fortnightly once	No.	12	17	20	49
	%	24.50%	34.70%	40.80%	100.00%
Weekly once	No.	7	7	12	26
	%	26.90%	26.90%	46.20%	100.00%
Weekly twice or more	No.	6	15	9	30
	%	20.00%	50.00%	30.00%	100.00%
Total	No.	32	61	57	150
	%	21.30%	40.70%	38.00%	100.00%

Table 8 proclaims that 48.9 per cent of the customers visiting the retail store once in a month and 50 per cent of the customers visiting the retail store weekly twice or more have agreed that they have impulsive buying behaviour sometimes whereas it was found always among 40.8 per cent of the customers visiting retail store once in a fortnight and 46.2 per cent of the customers visiting retail store weekly once. It denotes that the impulsive buying behaviour is found more among the customers visiting weekly once or fortnightly once.

Table-9: Demographic Variables and Impulsive Buying

Factors	Chi square value	DF	p value	Result
Gender	11.944	2	0.003	Significant @ 1%
Age	18.258	6	0.006	Significant @ 1%
Marital Status	2.451	2	0.294	Not Significant
Educational Level	6.081	8	0.638	Not Significant
Occupational Status	14.511	6	0.024	Significant @ 5%
Monthly Income	0.843	6	0.991	Not Significant
Size of family	0.429	4	0.980	Not Significant
Frequency of visit	5.5	6	0.481	Not Significant

According to the Table 9, the impulsive buying behaviour of the customers varies in accordance with their gender and age since the respective p values were less than 0.01. The occupational status has also a significant influence on the impulsive buying behaviour of the customers as indicated by the p value of 0.024 which is less than 0.05. However, as the p values were greater than 0.05, the other variables – marital status, educational levels, monthly income, size of family and frequency of visit have no significant impact on the impulsive buying behaviour of the customers.

Visual Merchandising and Impulsive Buying

The next part of the analysis deals with the impact of visual merchandising on the impulsive buying behaviour of the customers. In this regard, the following components of visual merchandising have been considered:

- Window display
- Mannequin display
- Floor merchandising
- Promotional signage
- Assortment

The effect of visual merchandising on impulsive buying behaviour of the customers has been analyzed using multiple regression analysis.

Table-10: Visual Merchandising and Impulsive Buying – Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.468	0.219	0.192	0.486

Predictors: (Constant), Assortment, Mannequin Display, Window Display, Promotional Signage, Floor Merchandising

Table 10 evinces that the r value was found to be 0.468. It reveals that the visual merchandising and impulsive buying are correlated to the extent of 46.8 per cent. However, the r square value 0.219 reveals that the 1 unit of change in the visual merchandising components have influenced 0.219 unit of change in the impulsive buying behaviour of the customers.

Table-11: Visual Merchandising and Impulsive Buying – Anova

Model	Source of variation	Sum of Squares	DF	Mean Square	F value	p value
1	Regression	9.516	5	1.903	8.059	0.000
	Residual	34.006	144	0.236		
	Total	43.523	149			

Dependent Variable: Impulsive Buying

Predictors: (Constant), Assortment, Mannequin Display, Window Display, Promotional Signage, Floor Merchandising

From the Table 11, it is understood that the F value was 8.059 and the p value was 0.000. It indicates that the selected components of visual merchandising together have made significant impact on the impulsive buying behaviour of the customers.

Table-12: Visual Merchandising and Impulsive Buying – Multiple Regression

Model	Factors	Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t value	p value
1	(Constant)	2.228	0.208		10.698	0.000
	Window Display	0.017	0.030	0.046	0.583	0.561
	Mannequin Display	0.026	0.029	0.067	0.898	0.371
	Floor Merchandising	0.039	0.033	0.097	1.206	0.230
	Promotional Signage	0.064	0.035	0.145	1.847	0.067
	Assortment	0.148	0.029	0.377	5.025	0.000**

Dependent Variable: Impulsive Buying ** Significant @ 1%

According to the Table 12, window display and mannequin display have no significant impact on the impulsive buying behaviour of the customers since the respective p values were (0.561; 0.371) greater than 0.05. The effect of floor merchandising and promotional signage on impulsive buying behaviour was also not significant as their p values were (0.230; 0.067) higher than 0.05. However, the impulsive buying behaviour of the customers has been influenced by assortment as indicated by the p value of 0.000 ($p < 0.01$).

Store Atmospherics and Impulsive Buying

Apart from the visual merchandising, certain other factors like store atmospherics could also have effect on the impulsive buying behaviour of the customers. The factors of store atmospherics considered for this study include:

- Lighting
- Temperature
- Colour
- Music
- Scent

Multiple regression analysis has been performed to test the impact of store atmospherics on the impulsive buying behaviour of the customers.

Table-13: Store Atmospherics and Impulsive Buying – Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.856	0.733	0.723	0.284

Predictors: (Constant), Scent, Lighting, Temperature, Music, Colour

From the Table 13, it could be understood that there has been a positive correlation between store atmospherics and impulsive buying to the extent of 0.856 since the correlation coefficient was found to be 0.856. The coefficient of determination indicates that the 1 unit change in the store atmospherics caused 0.733 unit change in the impulsive buying. It reveals that 73.3 per cent of the change in the impulsive buying is explained by the selected store atmospherics factors.

Table 14: Store Atmospherics and Impulsive Buying – Anova

Model	Source of variation	Sum of Squares	DF	Mean Square	F value	p value
1	Regression	31.881	5	6.376	78.873	0.000
	Residual	11.641	144	0.081		
	Total	43.523	149			

Dependent Variable: Impulsive Score

Predictors: (Constant), Scent, Lighting, Temperature, Music, Colour

It could be divulged from the Table 14 that the F value stating the relationship between store atmospherics and impulsive buying was 78.873 and the p value was 0.000. It discloses that store atmospherics factors together have made a significant impact on the impulsive buying behaviour of the customers.

Table 15: Store Atmospherics And Impulsive Buying – Multiple Regression

Model	Factors	Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t value	p value
1	(Constant)	1.203	0.110		10.942	0.000
	Lighting	0.133	0.018	0.317	7.199	0.000**
	Temperature	0.137	0.020	0.299	6.809	0.000**
	Colour	0.151	0.021	0.340	7.327	0.000**
	Music	0.150	0.019	0.368	8.005	0.000**
	Scent	0.113	0.020	0.248	5.600	0.000**

Dependent Variable: Impulsive Buying ** Significant @ 1%

Table 15 purports that all the selected factors of store atmospherics have made significant influence in the impulsive buying behaviour of the customers as the p values of all the variables were less than 0.01. The beta values revealed that colour has made 15.1 per cent of influence; music has made 15 per cent of influence and temperature has made 13.7 per cent of the impact. The impact of lighting was 13.3 per cent and that of scent was 11.3 per cent. It discloses that the highest impact was made by colour and the lowest impact was made by scent.

Findings

The key findings of the study have been summarised below:

From the analysis, it is proclaimed that the female customers had more impulsive buying behaviour than the male customers. The young customers, below the age of 20 years had less impulsive buying behaviour than the others while it is found to be greater among the customers pertaining to the age group of above 40 years.

Marital status wise analysis indicates that the higher impulsive buying is observed among the unmarried customers over the married customers. Graduates and post graduates have involved in impulsive buying more than the others. Impulsive buying behaviour has been found to be lesser among the employed than the customers engaged in other occupations.

It is further noted from the results that the low income customers have made planned purchases while the higher income customers have made unplanned and impulsive purchases. Impulsive buying behaviour was observed to be more among the small size family members while planned purchases were made by the large size family members. The customers visit the retail stores once in a week or once in a fortnight have stated that they always involve in impulsive buying.

Gender, age and occupational status have made significant influence on the impulsive buying behaviour of the customers. Assortment and impulsive buying behaviour have been found to be significantly associated.

The store atmospherics factors have been found to be significantly related with the impulsive buying behaviour. Among these factors, the highest influence was made by colour and the lowest impact was made by scent.

Suggestions

On the basis of findings of the study, the following suggestions have been offered:

It is suggested that the visual merchandising components shall be made trendy in order to attract more female customers. Peppy visual merchandising components are recommended to be made by the retailers which would draw the attention of the children and teen age customers.

Low price goods shall be displayed and the new arrivals shall be portrayed in the store front in order to enhance the impulsive buying behaviour of the customers working as employees.

Since assortment is influencing the impulsive buying, it is suggested that the retailers should provide more collection of brands and varieties of goods. Colour has a significant impact on the impulsive buying behaviour of the customers. Therefore, it is recommended that the retail store shall be painted with mild and attracting colours.

Conclusion

The customers visiting the retail stores involve in both planned and unplanned purchases. The unplanned purchases are referred to as impulsive purchases. The research made in this study that the impulsive buying behaviour of the customers varied in accordance with their gender, age and occupational status. Among the visual merchandising factors considered for the study, assortment is found to have affected the impulsive buying of the customers. Out of the factors of store atmospherics, colour and music have the ability to affect the impulsive buying while lesser impact has been made by scent.

References

- Dubey, N. and Sinha, R. (2017).** Factors affecting consumer buying behaviour in Big Bazaar retail store. *G-Journal of Education, Social Science and Humanities*. 2(1): 1-8
- Hussain, R. and Ali, M. (2015).** Effect of store atmosphere on consumer purchase intention. *International Journal of Marketing Studies*. 7(2), 2015: 35-43.
- Jamal, M. and Lodhi, S. (2015).** Consumer Shopping Behaviour in relation to factors influencing Impulse Buying: A Case of Superstores in Karachi, Pakistan. *International Journal of Scientific and Research Publications*. 5(12), December 2015: 41-59.
- Mitra, S.S., Arockiam, P. and Notts, R.M. (2020).** Examining the key determinants of Visual Merchandising in influencing consumer buying behaviour: A Study of Men's Apparel Brands. *International Journal of Business Marketing and Management*. 5(7), July 2020: 18-29.
- Murali, R. and Karthikeyan, K. (2017).** A Study on Visual Merchandising Techniques and its impact of impulse buying & customer patronage intentions among young adults of Trichirapalli City. *Shanlax International Journal of Economics*. 5(4), September 2017: 138-147.
- Nair, G.K. and Meesala, A. (2014).** Impact of visual merchandising elements on business outcomes of white goods and electronics stores. *Research Journal of Social Science & Management*. 4(2), June 2014: 115-129.
- Randiwela, P. and Wanninayake, WM.C.B. (2007).** The Impact of Visual Merchandising on Consumer Store Choice Decisions in Sri Lankan Supermarkets. *Global Conference on Business & Economics Proceedings*: 1-18.
- Singh, N. and Mhatre, G. (2016).** The Impact of visual merchandising on consumer behaviour in comparison with luxury and retail brands. *International Journal of Business and Administration Research Review*. 3(1), Jan-March 2016: 38-47.

The Role of Fintech in Enhancing MSMEs Growth and Economic Expansion in India

Dr. Jasveen Kaur

Senior Faculty, University Business School,
(Gurunanak Dev Univeristy), Amritsar,
Punjab, India.

Ms. Sarita Saini

Junior Research Fellow,
University Business School, (Gurunanak
Dev Univeristy), Amritsar, Punjab, India.

Abstract

In the current era of Industrial Revolution 5.0, the Fintech industry finance through technology has become increasingly important to the expansion of the Indian economy. In this regard, the financial technology sector, or Fintech, has emerged as a crucial element of India's economy, particularly impacting the development of MSMEs. MSMEs are the foundation of the Indian economy, making substantial contributions to GDP, exports, and job creation. MSMEs and economic growth are closely related, which emphasizes the need for a supportive financial infrastructure. Fintech promises to provide this infrastructure by resolving the ongoing issues MSMEs face with financing, payments, insurance, and access to microfinance. In order to assess the present state of Fintech and MSMEs in India, this study will look into their growth, influence, and reciprocal significance to the country's economy. Through a thorough review of secondary data from published research, working papers, and credible organizational reports, this study highlights the Fintech sector's significant contributions to resolving the financial and operational bottlenecks that frequently impede the expansion of MSME. Furthermore, Fintech applications have increased MSMEs' capacity to grow, optimize processes, and connect with new clientele, especially via digital channels that promote seamless transactions and effective money management. The study also examines the Fintech industry's overall development trajectory in India, concentrating on key players, legal frameworks, and technological developments that influence how this sector supports MSMEs. Fintech is an essential tool for MSMEs to increase market share, improve revenue generation, and boost operational efficiency in this digital ecosystem. In conclusion, the relationship between Fintech and MSMEs reveals a revolutionary avenue for the development of the Indian economy, offering a framework wherein technologically advanced financial solutions directly tackle the particular difficulties faced by MSMEs. In addition to strengthening MSME flexibility in a cut-throat market, this collaboration has opened the door for inclusive growth and development in the Indian economy as a whole. To better understand the sector's changing role in Industrial Revolution 5.0, future research can expand to longitudinal studies to evaluate the long-term effects of Fintech on MSME performance.

Keywords – Financial Technology (Fintech), Micro, Small & Medium Enterprises (Msmes), Digital Economy, Finance, Digital.

Introduction

In the twenty-first century, technology plays a crucial role in enabling people to lead simple, easy lives. Every day, technology is interfering more and more with every part of life. Thus, the demand for technology-based products is raised by this technological interference. Technology affects both the producer and the consumer, or the supply and demand sides, to boost productivity based on higher quality (Brynjolfsson & Saunders, 2009). Fintech can be defined as a company that uses new technology in conjunction with traditional financial methods to provide financial products, such as application-based finance instrument trading and the UPI (Unified Payment Interface) payment system. The term is derived from the words "finance" and "technology." Fintech's economic penetration has grown dramatically over the past 15 years, particularly since its demonization in 2016 (Mohan, 2020). Fintech is the term for this integration of technology and finance (Srikrishnan, 2017). It is marked by the combination of digital technologies, artificial intelligence (AI), robotics, and the Internet of Things (IoT) with traditional industries. The Fourth Industrial Revolution, also known as Industry 4.0 or, more recently, Industry 5.0, is what the world economy is currently going through (Chander & Pal, 2022). It is defined by the combination of digital technologies, artificial intelligence (AI), robotics, and the Internet of Things (IoT) with traditional industries, which is changing how businesses function and engage with markets and customers. Micro, Small, and Medium-Sized Enterprises (MSMEs) are the backbone of the Indian economy (Özdemir & Hekim, 2018). MSMEs rely heavily on finance, without it, their success is unthinkable, and in this day and age, they have integrated finance with technology. These businesses are the backbone of the Indian economy, making a substantial contribution to GDP expansion, job creation, and export revenue. Because they empower a variety of societal groups, such as women entrepreneurs and rural communities, MSMEs are essential for fostering innovation, entrepreneurship, and economic inclusivity (De, 2018). The convergence of MSMEs and Fintech has revolutionary potential. Fintech solutions provide MSMEs with more market opportunities, better risk management tools, expedited payment systems, and inexpensive financing (Agrawal & Zagade). This collaboration is promoting financial inclusion and economic empowerment by changing the way small businesses function and expand in the current digital era. It is challenging to raise money in India without offering adequate security,

particularly for loans to MSME's. Due to the small business's scale, an unfair assumption of credit risk is made. This is where the significance of fin-tech funding models is revealed. It mitigates the drawback of scale being small by assisting in the real-time transparency of business information (Greene & Bala, 2018). By lending money themselves, acting as financial product aggregators, or putting MSME in contact with banks and other financial institutions, fin-tech companies support MSME. The widespread use of smartphones and the rapid advancement of technology have allowed fin-tech companies to provide MSME access to credit that they rightfully deserve. They provide small businesses with creative and adaptable credit products that help them close the funding gap (DAN & Dewi, 2023). The study attempts to provide a broad overview of fin-tech and its significance today. This study focuses on examining the role of fin-tech companies in funding MSME in India and demonstrates that in order to provide MSME the benefits of formal lending, fin-techs and banks must collaborate to provide creative and customized digital offerings. The MSME sector contributes significantly to GDP, exports, and employment, all of which are important for the development of the country. The largest barrier to MSME growth and job creation in developing nations like India is limited access to credit. The lending industry must expand by 80% in order to generate the necessary jobs. The existing financial infrastructure is very expensive and only functions well in cities. It is based on physical branches and relationship managers (Mukherjee, 2018). Fin tech is presenting a promising remedy to get around this. Fin-tech is concentrated on providing quick and easy banking services to the MSME sector anywhere at any time. Lenders can more accurately verify the identity of the business owner with the use of fingerprint and iris scanning (Gupta & Tham, 2018). This is particularly important in nations where millions of people may share the same surname and where there are no addresses or identification registers. Lenders can determine an individual's creditworthiness faster by using psychological testing or mobile phone data analysis. Lending itself is evolving as a result of fin-tech (Van Loo, 2018). Loan arrangements are no longer required to be made at a bank branch thanks to crowdsourcing and mobile banking. Additionally, bit coin enables the settlement of international payments in a matter of minutes. It is much simpler for lenders to stay on top of things, say by automatically advising the business or sending texts, if business owners can handle their accounts and finances with basic apps.

Significance of Fintech in empowering MSMEs

Micro, Small, and Medium-Sized Enterprises (MSMEs) benefit greatly from fintech in a number of ways.

➤ **Finance Access:** Getting financing is one of the main issues facing MSMEs. Small businesses are frequently turned down for loans by traditional lenders because of alleged risks and a lack of collateral. Alternative financing options like invoice financing, crowdfunding, and peer-to-peer lending are provided by fintech platforms. These platforms make it simpler for MSMEs to obtain funding swiftly and at reasonable rates by utilizing technology to evaluate creditworthiness based on alternative data points.

✓ **Cost-Effectiveness:** Fintech solutions help MSMEs operate more economically by streamlining financial procedures. For small businesses, digital payment systems, automated accounting software, and online lending platforms mean less paperwork and middlemen, which means savings in terms of both time and money.

✓ **Financial Inclusion:** By assisting marginalized MSMEs that conventional financial institutions frequently ignore, fintech advances financial inclusion. MSMEs in remote locations or with restricted access to banks can now engage in the formal financial system, enhancing their financial resilience and growth prospects, thanks to mobile banking, digital wallets, and microinsurance products.

✓ **Data-Driven Insights:** Fintech companies use machine learning algorithms and big data analytics to give MSMEs actionable insights into market trends, customer behavior, and financial health. This data-driven strategy aids small businesses in decision-making, operational optimization, and the discovery of fresh avenues for expansion.

✓ **Risk management:** Fintech solutions provide MSMEs with cutting-edge instruments for risk management, including fraud detection systems, credit scoring models, and insurance plans customized to meet their requirements. By reducing risks related to lending, payments, and cybersecurity, these solutions improve small businesses' general stability and sustainability.

✓ **Market Expansion:** Fintech helps MSMEs to reach a wider range of consumers outside of specific geographic areas. Small businesses can grow and compete in global markets thanks to e-commerce platforms, digital marketing tools, and online payment gateways that enable cross-border trade and access to customers worldwide. In general, Fintech enables MSMEs to grow, innovate, and be resilient in the face of changing business conditions by giving them access to markets, inexpensive financing, effective financial management tools, and risk mitigation techniques.

Role of Fintech on the Growth of Msmes

Micro, Small, and Medium-Sized Enterprises (MSMEs) and financial technology (fintech) have come together in India to form a transformative force that is propelling growth and promoting economic development. Fintech plays an important role in increasing access to finance and promoting the growth of MSMEs by providing flexible products and better ways to solve problems. This fintech creates a foundation that can help MSMEs grow by facilitating digital identity verification, cooperative customer due diligence, data sharing, and payment plans. Additionally, it improves customer satisfaction and lowers the cost and increases accessibility to financial services. It is simpler for MSMEs to record financial transactions using different apps like Khatabook and UPI-based apps when they use fintech. Certain Fintech applications automatically log financial transactions and provide sales data on a weekly or monthly basis to assist MSME participants in comprehending the performance of their business. Additionally, the customer found that working with fintech-enabled businesses went more smoothly since it simplifies payment gateways and allows customers to conduct transactions without having to physically meet with sellers. This makes transactions more convenient, transparent, and accessible, and empowers users while being simple to use. Furthermore, the FinTech industry provides unique and innovative techniques for assessing risks through the use of big data, machine learning, and the creation of credit ratings for customers with negligible to no credit history, which helps companies expand their services throughout all of India. Fintech is tackling these issues and helping MSMEs prosper in a more digital and competitive market with its creative solutions. Enhancing access to financing is one of fintech's most important contributions to MSMEs. MSMEs have historically had difficulty obtaining loans from traditional banks because of their strict credit requirements and dearth of significant collateral. Fintech companies provide creative lending solutions like invoice financing, crowdfunding, and peer-to-peer (P2P) lending by utilizing technology and alternative data sources. These platforms evaluate MSMEs' creditworthiness more quickly and accurately by using big data analytics and sophisticated algorithms. This makes it easier and faster for MSMEs to obtain desperately needed capital. For MSMEs to invest in growth opportunities, grow their businesses, and become more competitive, financial inclusion is essential. Fintech also helps MSMEs operate more efficiently by digitizing their financial procedures. The use of digital payment solutions, like Unified Payments Interface (UPI) and mobile wallets, has completely changed how MSMEs perform transactions. These digital platforms provide easy and safe payment options, cut transaction costs, and lessen reliance on cash. As a result, MSMEs that implement quick and easy payment methods can improve customer satisfaction and manage their cash flows more skillfully. Fintech companies also offer automated invoicing and accounting software that streamlines back-office operations, cutting down on human error and freeing up resources for important business initiatives. Another area where fintech is making great progress is risk management. MSMEs are vulnerable to a range of risks, such as shifts in the market and interruptions in operations, and frequently operate with narrow profit margins. Fintech solutions offer advanced risk management capabilities like customizable insurance plans and real-time fraud detection systems. Blockchain technology, for example, lowers the risk of fraud by guaranteeing the security and transparency of transactions. Fintech-enabled insurance platforms also provide customized policies that address the unique requirements of MSMEs, assisting them in reducing the risks related to their day-to-day operations. Fintech also helps MSMEs grow their customer base and penetrate new markets. MSMEs can reach a wider audience outside of their local markets by using digital platforms with e-commerce capabilities. Fintech tools help MSMEs target particular customer segments, personalize their offerings, and interact with their audience more successfully. Examples of these tools are digital marketing and analytics-driven insights. In addition to increasing sales, this greater market penetration also improves customer loyalty and brand visibility. Financial empowerment and financial literacy are additional roles that fintech plays in the MSME sector. Fintech platforms frequently include tools and educational resources to assist MSMEs in understanding market trends, compliance requirements, and financial management. With this information, MSME owners are better equipped to plan strategically for long-term growth, optimize their operations, and make educated decisions. Furthermore, the integration of fintech in the MSME sector has been further stimulated by the government's supportive policies and regulatory framework. The Digital India campaign and the Pradhan Mantri Jan Dhan Yojana, for example, have created a solid foundation for a digital infrastructure that will support the growth of fintech services. MSMEs are more likely to adopt these technologies because regulatory bodies like the Reserve Bank of India (RBI) have established guidelines to guarantee the secure and effective operation of fintech platforms. To summarize, fintech is contributing significantly to the expansion and success of MSMEs in India through facilitating better access to capital, increasing operational effectiveness, offering strong risk management solutions, opening up new markets, and promoting financial literacy. Fintech is predicted to advance MSMEs' economic empowerment as it develops, propelling equitable growth and setting them up for long-term success in the digital era.

Literature Review

In India, fintech has become a relatively new industry in the last few years. Due to the nation's strong and successful government reforms that are driving the nation toward a digital economy, the Indian market has witnessed massive investments in FinTech across multiple industries. Growing smartphone and internet usage has

also been beneficial, leading to a rise in FinTech and the usage of digital technology across the nation Erik Feyen & Saal, (2021). The new technology known as financial technology, or fin-tech, aims to compete with established financial practices in the provision of financial services. In India, a new financial services sector known as fin-tech has emerged. Businesses in this sector use technology to deliver financial services. These businesses are involved in a number of industries, including payments, insurance, and wealth management. This study is to comprehend the fin-tech industry's growth and the difficulties it faces Giglio, (2021). The conceptual framework and foundation needed to comprehend the swift and prosperous development of recently developed financial technologies are provided by this article. Fin-tech supports the growth of startups in India, the MSME sector, banks' digital transformation, and the cashless economy. This essay discusses the difficulties the fin-tech sector has faced in India. Due to their vital role in the economy, MSMEs will benefit from increased access to financial products through the use of financial technology, which will also increase their financial literacy Irman et al., (2023). Financial literacy has been shown to be closely correlated with a firm's performance because it is critical for determining the effectiveness of past actions and is used to affect the current situation. Fintech can help MSMEs raise funds for their operations more quickly and can also help with information sharing, customer experience, and other areas. Rahul Kumar et al., (2021). FinTech is a new business model that, as opposed to bank services, actually benefits MSMEs. FinTech offers financial transaction services without requiring an account, unlike other providers. Even though FinTech is not a financial institution like other banks, it is nevertheless subject to Bank Indonesia regulations. The public or consumers are to be protected by this. Companies using the model are required by Bank Indonesia to register their businesses with either the Financial Services Authority or Bank Indonesia Rahma, (2018). A nation or region's ability to create jobs is aided by MSMEs. Even though each MSME employs a relatively small number of people, the MSME sector as a whole employs a sizable number of people. MSMEs frequently have the ability to create distinctive, creative, or high caliber goods or services Marolt et al., (2016). MSMEs typically have greater flexibility and can react more swiftly to shifting market trends because of their smaller size Zahrah & Wijaya, (2019). Fin-Tech is growing faster than ever, but this also means that consumers need to learn more to deal with increasingly sophisticated products and technology Fu et al., (2019). Though research hasn't been able to conclusively show that one gender is more likely than the other to use technology, Generation Z has been found to be less willing to use it than Generation Y Murugan et al., (2021). Noorinasab et al., (2016), Entrepreneurs deal with issues like insufficient funding and how to raise capital for their startups. A lot of business owners are unable to obtain outside funding due to insufficient market credit and security. The loan application procedure takes a long time. Additional issues include a decline in profit due to competition, improperly maintained financial statements by MSMEs' owners, insufficient guarantees for loan funding, equity issues during capital raising, and reliance on money lenders for expensive loans. The financial services industry is undergoing a global transformation due to the phenomenon of innovation in the digital age. A brand-new phenomenon known as Financial Technology (FinTech) emerged as a result of all these developments. A few financial services start-ups have attempted to offer financial services to the general public. Innovations in the field (from current financial institutions) have surfaced as more information. FinTech has grown to be a larger industry than the Internet of Things (IoT), and with quantum computing, it will undergo exponential change in the future. New asset classes and technologies are still being developed, and they will alter the way businesses operate today. Even those who are not involved in this new industry and merely observe it are interested in IoT because it connects many technology-related businesses and industries (Schulte & Liu, 2018; Nakashima, 2018).

Research Objectives

This study's main goal is to investigate the connection between the expansion of MSMEs in India and the Fintech sector. The particular goals consist of;

- To investigate the Fintech industry's development trajectory, key players, regulatory framework, and technological developments in India.
- To analyse the effect of fintech on the following MSMEs growth metrics, costs, revenue, market share, customer acquisition, and operational efficiency.

To comprehend the development trajectory of India's Fintech industry, including its major players, regulatory framework, and technological advancements, a thorough review of the body of existing literature will be undertaken.

Research Methodology

A secondary data analysis will be carried out, depending on previously published literature, in order to achieve the research goals. To comprehend the development trajectory of India's Fintech sector, a thorough review of scholarly and industry-based literature will be conducted. Reputable sources including industry reports, scholarly journals, official publications, and credible financial news outlets will be the source of secondary data. There will be data collection on the adoption of fintech, MSMEs growth metrics, regulatory changes, and regional economic disparities. Technology developments that have affected MSME growth, such as blockchain, artificial intelligence, digital payment platforms, and mobile banking apps, will also be covered in the literature.

Discussions

Fintech

Assessing the current state of the Fintech sector in India entails looking at a number of factors, including its growth trajectory, major participants, regulatory environment, and technological innovations, especially with regard to helping Micro, Small, and Medium-Sized Enterprises (MSMEs). Over the past ten years, India's Fintech industry has grown and changed quickly. Driven first by digital payment solutions, the sector has grown to include wealth management, lending, insurance, and regulatory technology (RegTech), among other financial services. The trajectory of the Fintech industry in India is indicative of a movement towards digital transformation and universal financial inclusion in various domains, including MSMEs. A wide range of entities, including government programs, established financial institutions, startups, and tech firms, comprise India's Fintech ecosystem. Digital payment providers like Paytm, PhonePe, and Google Pay, lending platforms like Lendingkart and Capital Float, insurance aggregators like Policybazaar, and regulatory technology companies providing compliance solutions for MSMEs are some of the major players in the Fintech space. The legal and regulatory environment that oversees the Fintech sector in India has developed to support innovation while guaranteeing consumer safety and legal compliance. Fintech activities are heavily regulated by the Reserve Bank of India (RBI), which has policies and guidelines pertaining to payment systems, digital lending, cybersecurity, data privacy, and anti-money laundering (AML) measures. For MSMEs to confidently adopt Fintech solutions, regulatory clarity and a supportive legal environment are critical. The current state of India's Fintech industry is distinguished by a wide range of creative solutions targeted at addressing the unique needs and difficulties faced by small businesses in the context of assisting MSMEs. Enabling digital wallets, online invoicing, and cashless transactions for MSMEs to enhance customer convenience and liquidity management. Digital lending platforms: These provide MSMEs with quick and easy access to credit solutions through the use of alternative data sources and real-time creditworthiness assessments. Ensuring compliance with legal requirements by offering MSMEs automated compliance solutions for tax computations, regulatory reporting, and GST filings. Using digital platforms, MSMEs can easily manage their finances, obtain working capital loans, and complete banking transactions. All things considered, the current state of the Fintech industry in India offers a thriving ecosystem of cutting-edge services and solutions designed to empower MSMEs, boost their competitiveness, and promote inclusivity and economic growth.

MEMEs

Analysing how Fintech interventions affect different performance metrics of Micro, Small, and Medium Enterprises (MSMEs), such as revenue growth, cost reductions, market penetration, customer acquisition, and operational effectiveness, is necessary to assess the impact of Fintech on MSME growth. By providing access to new markets, facilitating online sales channels, optimizing pricing strategies, and boosting customer engagement, fintech interventions can significantly contribute to the revenue growth of MSMEs. Fintech platforms, for instance, that provide e-commerce capabilities, digital marketing tools, and analytics-driven insights, can assist MSMEs in growing their clientele, revenue streams, and sales. By automating repetitive tasks, cutting paperwork, optimizing efficiency, and streamlining processes, fintech solutions frequently result in cost savings for MSMEs. Digital payment solutions, for example, lower transaction costs, do away with the need for manual cash handling, and enhance cash flow management. Similar to this, MSMEs can cut costs by saving time and money with automated invoicing systems and cloud-based accounting software. MSMEs can expand their customer base and enter new markets with the help of fintech interventions. Digital marketing campaigns, focused promotions, tailored products, and online channels that link MSMEs with prospective clients around the world are used to accomplish this. Fintech also makes cross border transactions easier, which enables MSMEs to trade internationally and reach a wider market. Fintech platforms help MSMEs acquire new customers by providing easy-to-use financial services, tailored product recommendations, frictionless payment processes, and loyalty initiatives. For instance, AI-driven algorithms are used by digital lending platforms to evaluate credit risk and provide customized loan products to MSMEs, drawing in new clients who might not otherwise have access to traditional banking services. By offering real-time data analytics, predictive insights, task automation, and business process integration, fintech solutions improve the operational effectiveness of MSMEs. Better decision-making, more effective resource allocation, quicker reaction times, and increased efficiency all result from this. Supply chain finance platforms, for example, help MSMEs manage their working capital better, lower supply chain risks, and optimize inventory management.

Conclusion

Over the past ten years, the Fintech industry in India has experienced tremendous growth and change. Initially driven by digital payment solutions, the industry now offers a wide range of financial services, including wealth management, lending, insurance, and regulatory technology (RegTech). This development is indicative of a larger trend toward financial inclusion and digital transformation, especially for MSMEs (micro, small, and medium-sized enterprises). The Fintech ecosystem in India is made up of a wide variety of organizations, including government initiatives, well-known financial institutions, tech companies, and startups. Prominent firms like

Paytm, PhonePe, Lendingkart, and Policybazaar provide cutting-edge solutions designed specifically to meet the requirements of MSMEs. The Reserve Bank of India (RBI) is in charge of overseeing the regulatory environment, which has developed to strike a balance between innovation, consumer protection, and legal compliance. This framework gives MSMEs the assurance they need to embrace Fintech solutions. The Fintech sector in India is currently characterized by an abundance of innovative solutions designed to tackle the particular challenges faced by micro, small, and medium enterprises. Online invoicing, cashless transactions, and digital wallets improve customer convenience and liquidity management. Digital lending platforms offer instant credit availability through real-time evaluations and alternative data sources. Legal compliance is guaranteed by automated compliance solutions, and working capital access and effective financial management are made possible by digital platforms. Analyzing how Fintech interventions affect MSME growth reveals notable gains in a number of performance indicators. Fintech makes it easier to grow your revenue by opening up new markets, streamlining your pricing tactics, and increasing customer interaction with e-commerce and digital marketing tools. Automation, streamlined procedures, and cheaper transaction costs all contribute to cost reductions that improve productivity and cash flow management. Fintech platforms facilitate cross-border transactions and enable targeted promotions and tailored products, thereby expanding market penetration. Personalized loan products and user-friendly financial services that use AI-driven algorithms to assess credit risk improve customer acquisition. Task automation, predictive insights, and real-time data analytics all increase operational effectiveness by facilitating better resource allocation and decision-making. In summary, India's Fintech market currently provides a thriving ecosystem of cutting-edge services and products aimed at empowering MSMEs, boosting their competitiveness, and promoting inclusive economic growth. Fintech interventions have the potential to significantly accelerate the growth and development of MSMEs in India, provided that regulations remain supportive and technological advancements continue to occur.

Implication and Future Research

Fintech's integration with the Indian MSME sector has significant ramifications that affect the economy on several fronts. The convergence of technology and finance poses a dual prospectus for Micro, Small, and Medium-Sized Enterprises (MSMEs), which play a pivotal role in propelling India's economic expansion. One of the biggest effects is the improvement of MSMEs' access to capital through improved financial inclusion. Due to perceived risks and a lack of collateral, MSMEs were historically underserved by traditional banking systems. However, today, they have access to a variety of financing options, including invoice financing, crowdfunding, and peer-to-peer lending. Fintech platforms use technology to evaluate creditworthiness based on non-traditional data points, which facilitates funding for small businesses. This amalgamation of By enabling MSMEs in remote locations or with restricted banking access to engage in the formal financial system, this democratization of finance promotes resilience and wider economic participation. Fintech solutions reduce the operational burdens that usually impede MSMEs by streamlining financial processes. Online lending platforms, automated accounting software, and digital payment systems reduce the need for paperwork and middlemen, saving a significant amount of time and money. By reallocating resources to core business operations, these efficiencies enable MSMEs to increase profitability and productivity. Additionally, cloud-based accounting and digital invoicing tools enhance cash flow management, which is critical to small businesses' viability. Market Expansion and Revenue Growth: By giving MSMEs the resources they need to reach out to new clients and break into international markets, fintech promotes market expansion. Digital marketing tools, online payment gateways, and e-commerce platforms allow MSMEs to trade internationally, which broadens their customer base beyond local markets. Gaining access to a larger market has the potential to greatly increase sales and propel company expansion. Fintech platforms' analytics-driven insights also assist MSMEs in improving customer engagement, streamlining pricing strategies, and customizing their goods to effectively meet market demands. The MSME sector's adoption of fintech promotes an innovative culture. Big data, machine learning, and artificial intelligence (AI) give MSMEs instant access to information about consumer behaviour, market trends, and financial health. These technologies make it possible to make wiser decisions, allocate resources more effectively, and react to changes in the market more quickly. In addition, the incorporation of blockchain and IoT into supply chain finance improves efficiency and transparency while lowering supply chain risks and maximizing inventory control. Problems and Things to Think About: Despite these advantages, there are still issues with fintech integration in the MSME sector. To guarantee the long-term adoption of fintech solutions, concerns like cybersecurity, data privacy, and the digital divide must be addressed. It is imperative that regulatory frameworks adapt to strike a balance between innovation and consumer protection. This will allow MSMEs to confidently embrace new technologies without sacrificing security or compliance. In conclusion, fintech has far-reaching and revolutionary effects on MSMEs in India. Fintech enables MSMEs to prosper in a competitive environment by improving risk management, market access, operational efficiency, and financial inclusion. To fully realize fintech's potential in promoting sustainable growth and economic development in the MSME sector, however, issues with security, regulations, and digital literacy must be resolved.

References

- Agrawal, S., Gupta, G. and Zagade, A., (2020).** Fintech: a New Revolution in India. *Journal NX*, pp.47-57.
- Brynjolfsson, E. and Saunders, A., 2009. *Wired for innovation: How information technology is reshaping the economy*. Mit Press.
- Chander, B., Pal, S., De, D. and Buyya, R., (2022).** Artificial intelligence-based internet of things for industry 5.0. *Artificial intelligence-based internet of things systems*, pp.3-45.
- De, N. and Mondal, T., (2018).** Micro, Small & Medium Enterprises (MSMEs) and Potential Women Entrepreneurs for Inclusive Growth in India. *International Journal of Research in Management*, 8(1), pp.95-107.
- DAN, S.S. and Dewi, E.F., (2023).** *The Future of Digital Finance In Southeast Asia: A Legal Perspective*. Prenada Media.
- Feyen, E., Frost, J., Gambacorta, L., Natarajan, H. and Saal, M., (2021).** Fintech and the digital transformation of financial services: implications for market structure and public policy. *BIS papers*.
- Fu, J. and Mishra, M., (2020).** The global impact of COVID-19 on FinTech adoption. *Swiss Finance Institute Research Paper*, (20-38).
- Giglio, F., (2022).** Fintech: A literature review. *International Business Research*, 15(1), pp.80-85.
- Gupta, P. and Tham, T.M., (2018).** *Fintech: the new DNA of financial services*. Walter de Gruyter GmbH & Co KG.
- Greene, E.F., Amico, J.M. and Bala, S., (2018).** Blockchain, marketplace lending and crowdfunding: emerging issues and opportunities in fin tech. In *Research Handbook on Shadow Banking* (pp. 253-296). Edward Elgar Publishing.
- Irman, M., Budiyo, B. and Suwito, S., (2023).** Increasing financial inclusion through financial literacy and financial technology On MSMEs. *International Journal Economics Development Research*, pp.126-141.
- Mohan, D., (2020).** *The financial services guide to Fintech: Driving banking innovation through effective partnerships*. Kogan Page Publishers.
- Morgan, P.J. and Trinh, L.Q., (2020).** *Fintech and financial literacy in Viet Nam* (No. 1154). ADBI Working Paper Series.
- Mukherjee, S., (2018).** Challenges to Indian micro small scale and medium enterprises in the era of globalization. *Journal of Global Entrepreneurship Research*, 8, pp.1-19.
- Özdemir, V. and Hekim, N., (2018).** Birth of industry 5.0: Making sense of big data with artificial intelligence, "the internet of things" and next-generation technology policy. *Omics: a journal of integrative biology*, 22(1), pp.65-76.
- Rahma, T.I.F., (2018).** Persepsi Masyarakat Kota Medan Terhadap Penggunaan Financial Technology. *At-tawassuth: jurnal ekonomi islam*, 3(1), pp.184-203.
- Srikrishnan, S., (2017).** Demonetization, the movement to an electronic payments system and the inch towards full financial inclusion in the Indian economy.
- Schulte, P. and Liu, G., (2018).** FinTech is merging with IoT and AI to challenge banks: how entrenched interests can prepare. *The Journal of alternative investments*, 20(3), p.41.
- Van Loo, R., (2018).** Making innovation more competitive: The case of fintech. *UCLA L. Rev.*, 65, p.232.
- Zahrah, A. and Wijaya, P.A., (2019).** Manfaat eksistensi usaha mikro kecil menengah (UMKM) terhadap unemployment rate. *Society*, 10(2), pp.110-1016.

An Empirical Study of Service Quality, Customer Satisfaction, and Loyalty Dynamics among Visitors to South Indian Restaurants in Northern India

Dr. Parminder Singh Dhillon

Assistant Professor, Department of Tourism,
Hospitality and Hotel
Management, Punjabi University, Patiala,
India.

Dr. Anuradha Chakravarty

Department of Tourism, Hospitality and
Hotel Management, Punjabi University,
Patiala, India.

Abstract

This study investigates the intricate relationships between service quality dimensions, customer satisfaction, and loyalty among patrons of South Indian restaurants in Northern India. Given the growing popularity of South Indian cuisine in diverse regional settings, understanding the factors that contribute to customer experiences in this niche market is essential for restaurateurs and stakeholders in the hospitality industry. A total of 712 respondents were initially surveyed from several key northern states using a judgmental sampling approach. However, 338 responses were deemed inappropriate for analysis, resulting in a final sample of 374 participants. The research utilized the SERVQUAL scale to assess perceived service quality, in conjunction with validated measures of customer satisfaction and loyalty. This methodological triangulation allowed for a comprehensive analysis of the factors influencing visitor experiences in South Indian food joints.

The findings reveal that specific dimensions of service quality—particularly tangibility, reliability, and assurance—significantly impact customer satisfaction. Patrons who perceive high levels of these qualities tend to report greater satisfaction with their dining experiences. Conversely, tangibility, responsiveness, and empathy emerged as critical dimensions influencing customer loyalty. Visitors who felt that their needs were promptly addressed and that staff were empathetic were more likely to demonstrate loyalty to the establishment.

Moreover, the analysis highlights that visitor demographics—such as age, culinary background, and previous dining experiences—play a vital moderating role in the relationship between service quality and customer satisfaction. This suggests that different visitor profiles may prioritize distinct service quality attributes, necessitating tailored approaches to service management. The implications of these findings are substantial for the restaurant industry, particularly for South Indian food outlets in Northern India. By understanding the specific service quality elements that enhance customer satisfaction and loyalty, restaurant operators can refine their service delivery models. This may include investing in staff training, improving the physical environment, and adopting more personalized service strategies to cater to diverse customer preferences. In conclusion, this study contributes to the broader discourse on service quality in the hospitality sector, offering actionable insights that can lead to enhanced customer experiences and sustained loyalty in a competitive culinary landscape. Future research could further explore the longitudinal effects of service quality improvements on customer retention and business performance.

Keywords – Customer Satisfaction, Gastronomic Experience, Loyalty, Service Quality, South Indian Restaurant, Visitor Type.

Introduction

Background

Gastronomic tourism is connected with tourists' experience of food and other related activities during travel (Shalini & Duggal, 2015). Gastronomic delicacies are considered to be a significant aspect of the overall satisfaction and quality experience of the tourists during their visit (Shalini & Duggal, 2015). The linkage of local food and tourism allows the tourists to connect with the culture of a place and as per studies it has been observed that one-third of the total expenditure of tourists is spent on experiencing the local food (Giampiccoli & Kalis, 2012). Satisfaction of tourists is of prime importance not only to trigger the desire to visit the food outlet again but also to recommend others (Cakici et al., 2019). Tourists who are satisfied with their experience tend to revisit and spread positivity among friends and relatives which in turn leads to higher revenue generation for a destination (Arasli et al., 2021).

The restaurant industry serves a diverse group of customers, including tourists, business travelers, families, couples, solo diners, first-timers, and repeat visitors (Sanchez-Cañizares & Castillo-Canalejo, 2015). Each visitor type has unique needs and preferences when it comes to dining out. For example, tourists may prioritize the ambiance and cultural experience of the restaurant, while business travelers may prioritize the speed and efficiency of the service (Sanchez-Cañizares & Castillo-Canalejo, 2015). However, families may prioritize the affordability and family-friendly atmosphere of the restaurant, while couples may prioritize the intimacy and romantic ambiance (Toudert

& Bringas-Ra'bago, 2021). On the other hand, solo diners may prioritize the ease of dining alone, while first-timers may prioritize the meal quality and the service to determine if they will return (Toudert & Bringas-Ra'bago, 2021). Thus, repeat visitors are likely to have established preferences and expectations for the restaurant, which may change over time based on their previous experiences (Toudert & Bringas-Ra'bago, 2021).

Indeed, it's a well-known fact that Indians have a deep and passionate love for food. Indian cuisines are incredibly diverse, with a wide variety of flavors, ingredients, and cooking styles that cater to various regional tastes and preferences (Narayan, 1995; Sen, 2004). Over the past few years, South Indian cuisine has become increasingly popular in North India (Nandy, 2004). Known for its distinct flavours and healthy ingredients, South Indian food has become a favorite among food lovers in the region (Nandy, 2004; Sengupta, 2010). Many restaurants in North India have started offering South Indian dishes on their menus to cater to the growing demand for this cuisine (Baviskar, 2021). The popularity of South Indian food can be attributed to its wide variety of vegetarian and non-vegetarian dishes, including Dosas, Idlis, Vadas, and Sambar, among others (Nandy, 2004; Iyer, & Ananthanarayan, 2008). Additionally, the use of coconut, curry leaves, and other flavorful spices in South Indian cuisine has won over the taste buds of North Indian food enthusiasts (Nandy, 2004). The craze for South Indian food in North India has led to the opening of numerous South Indian restaurants in the region.

Research Gap

While substantial research has explored the relationship between service quality, visitor satisfaction, and loyalty within the foodservice sector (Qin & Prybutok, 2009; Khan & Shaikh, 2011; Aftab et al., 2016; Keshavarz et al., 2016; Zhong, 2020), there remains a notable gap concerning the specific context of South Indian food establishments. South Indian cuisine has seen increasing popularity in North India, marked by the growth of dedicated South Indian restaurants (Nandy, 2004). However, given the rise in competition within this sector, it is crucial for South Indian restaurants to focus not only on food quality but also on service quality to enhance customer satisfaction, loyalty, and competitive positioning. Limited studies have examined how the unique characteristics of service quality in South Indian restaurants influence visitor satisfaction and loyalty, particularly considering different visitor types. Addressing this gap is essential for understanding and improving the customer experience in South Indian food outlets.

Research Objectives

- This study aims to address the identified gap by examining the impact of service quality on visitor satisfaction and loyalty in South Indian food outlets. Specifically, the research objectives are to:
- Investigate the influence of service quality on visitor satisfaction and loyalty within South Indian restaurants.
- Assess the moderating role of visitor types (e.g., first-time vs. repeat visitors) in the relationship between service quality and visitor satisfaction.
- Contribute to the existing body of knowledge in the foodservice sector, particularly within the South Indian restaurant context, thereby providing a foundation for future research in this area.

Significance of Study:

The findings of the study have a wide range of practical implications for food businesses. Restaurant owners and managers can consider the expected visitor type when designing and implementing service quality strategies. Varied sorts of visitors may have varied expectations and preferences, and these expectations and preferences may alter based on the type of food outlet and the circumstances of the visit. The owners and managers may customize their service quality plans to fit the individual requirements and preferences of their visitors by recognizing the moderating influence of their type, which can lead to improved levels of satisfaction and loyalty.

Review of Literature

Customer Satisfaction:

Satisfaction is the inner peace that emanates from the consumption experience (Schmidt & Spreng, 1996; Vukmir, 2006). Satisfaction is a cognitive outcome that is derived from service experience (Huang et al., 2015). The purchased products are used and the services are experienced by a customer which gives them satisfaction (Jiradilok et al., 2014). The perceived quality or experience is the consumers' views on any goods or services that they want to buy or consume (Zeithaml, 1988). Researchers typically consider that customer happiness and the perception of the features of the service are the two connected and essential factors in service management (Kassim & Asiah Abdullah, 2010). The success of any business depends upon customer satisfaction and it becomes essential to identify the factors that influence customer satisfaction (Kandampully & Suhartanto, 2000).

Customer satisfaction has been a major concern for businesses as it is closely linked to customer loyalty and business success (Kandampully & Suhartanto, 2000; El-Adly, 2019). Customer satisfaction is especially significant in the restaurant business since it immediately influences the customer's eating experience and is likely to return (Leninkumar, 2017; Kim & Bachman, 2019). High levels of customer satisfaction often lead to increased customer loyalty, and loyal customers, in turn, contribute significantly to a restaurant's success. As a result,

restaurant owners and managers must understand the aspects that impact customer satisfaction (Saad Andaleeb & Conway, 2006; Keshavarz et al., 2016). SERVQUAL is a widely used model for assessing service quality which involves five dimensions (Parasuraman et al., 1988).

Service Quality and Customer Satisfaction:

Perceived service quality is nothing but the evaluation of product or service offerings, whereas customer satisfaction is its transactional assessment. Employee reactions, price, and food quality have been identified as influencing factors of customer satisfaction in this industry. The research on food restaurants in China has revealed that service quality, food quality, and perceived value are the precursors to customer satisfaction (Prybutok, 2008). Tan et al. (2014) examined the customer perception regarding the fast food restaurant's service quality, with a modified DINESERV scale and using a mixed-methods approach, and found a positive effect of service quality on customer satisfaction and suggested areas for improvement (Karamustafa & Ülker, 2020). Different aspects of food quality, such as taste, food safety, menu variety, and presentation, have also been identified as important contributors to customer satisfaction (Liu & Jang, 2009). According to studies, the taste and presentation of food at mid to upmarket restaurants have a significant impact on customer satisfaction and behavioral intentions (Ryu et al., 2012). Previous studies have found a strong relationship between service quality and customer satisfaction in the food service business (Kim et al., 2009; Min and Min, 2011). Additionally, Nguyen et al. (2018) found that the SERVQUAL dimensions have a significant impact on customer satisfaction in the restaurant industry. Abdul and Zainal (2016) found a significant influence of perceived value, emotional price, monetary price, behavioral price, and reputation, on customer satisfaction. Their findings revealed that emotional, monetary, and behavioral prices had a highly significant influence on customer satisfaction. This suggests that emotional experiences, monetary considerations, and behavioral aspects of the customers significantly contribute to their overall satisfaction. The service quality was measured by the SERVQUAL scale by numerous researchers (Lee, 2011; Vijayvargy, 2014; Daengs et al., 2020; Song et al., 2022). The effects of all five dimensions were also studied and proved to have a significant effect on customer satisfaction. Various studies conducted to explore the association between the SERVQUAL dimensions and satisfaction has been discussed below:

Tangibility

Tangibility refers to the physical look of the restaurant, including the amenities, equipment, and staff appearance. It is an important factor that can influence various aspects of the customer experience. Tangibility plays a significant role in customer satisfaction, particularly in the context of service-based businesses and experiences (Panda & Das, 2014; Aftab et al., 2016). Tangible aspects like easy-to-navigate store layouts or user-friendly physical products can improve accessibility and convenience, leading to greater customer satisfaction (Liu et al., 2017). Customers perceive a higher level of service quality when the restaurant has modern and well-maintained facilities (Daengs et al., 2020; Song et al., 2022). Customers perceived the physical appearance of the staff, such as their attire and grooming, as an important factor in their overall dining experience (Nguyen et al., 2018). Hence, investing in the physical appearance of the food place and its staff can positively impact customer satisfaction (Karamustafa & Ülker, 2020).

Reliability

Reliability is an important element of SERVQUAL. This dimension is particularly important in the restaurant industry, as customers expect their orders to be accurate and delivered on time (Hildebrandt & Ulmer, 2022). When customers perceive a product or service as reliable, it can lead to higher levels of satisfaction and loyalty (Cheng et al., 2021). Reliability can mitigate concerns that customers might have about investing time or money in a product or service (Setiono & Hidayat, 2022). Several studies documented a positive association between reliability and customer satisfaction in the restaurant industry (Saad Andaleeb & Conway, 2006; Daengs et al., 2020). Nguyen et al. (2018) found that customers were more satisfied when the restaurant was able to deliver their orders on time and without errors. They were more likely to return to the same restaurant if they had a positive experience with the reliability of the service.

Responsiveness

Responsiveness is a crucial element in the food industry when it comes to customer satisfaction. The food industry includes restaurants, cafes, food delivery services, and other food-related businesses (Ali et al., 2021). Service providers can respond to customer requests and complaints promptly. Several previous studies (Al-Tit, 2015; Kanyama et al., 2022) found a positive association between responsiveness and customer satisfaction in the restaurant industry. Customers were more satisfied when their complaints were resolved quickly and efficiently (Meuter et al., 2000). Similarly, Lee and Kim (2020) found that customers perceived a higher level of service quality when the staff was responsive to their requests. Businesses that prioritize responsiveness by focusing on order accuracy, communication, customization, customer service, and feedback management are more likely to create positive experiences for their customers (Rao, 2013; Daengs et al., 2020). These results suggest that

responsiveness has a positive influence on customer satisfaction.

Assurance

It means the knowledge and courteousness of the restaurant's staff and their capabilities to inspire belief and confidence in the customers (Saad Andaleeb & Conway, 2006). Several studies have shown a positive link between assurance and customer satisfaction in the restaurant industry (Omar et al., 2016). Customers are more satisfied when the staff are found knowledgeable and promptly respond (Saad Andaleeb & Conway, 2006). When customers are confident that their food is safe, it enhances their satisfaction and trust in the establishment. Similarly, customers perceived a higher level of service quality when the staff was courteous and polite (Lee, 2011; Mahsyar & Surapati, 2020). In the food industry, assurance is not only about delivering high-quality food but also about creating an atmosphere of trust and confidence throughout the dining experience (Gopi & Samat, 2020). These findings suggest that investing in staff training and ensuring that they have the necessary knowledge and skills can positively influence customer satisfaction.

Empathy

Empathy refers to the service provider's capability in addressing the customer's emotional needs (Wieseke et al., 2012). Several studies have found a positive association between empathy and customer satisfaction in the food service business. Empathy plays a significant role in enhancing customer satisfaction in the food industry. It fosters trust, creates positive emotional connections, and demonstrates a commitment to meeting customer needs (Jiang et al., 2021). Customers are more satisfied when the staff can understand their emotional needs and respond appropriately (Kassim & Asiah Abdullah, 2010). Empathetic food establishments prioritize the needs and preferences of their customers. They actively listen to customer feedback, take note of special requests, and tailor their services accordingly (Slack et al., 2020). Customers perceive a higher level of service quality when the staff can create a warm and welcoming atmosphere (Huang et al., 2015).

From the literature concerning the service quality dimensions and customer satisfaction, the following hypotheses have been designed:

H1a: There is a positive association between Tangibility and Customer Satisfaction

H1b: There is a positive association between Reliability and Customer Satisfaction

H1c: There is a positive association between Responsive and Customer Satisfaction

H1d: There is a positive association between Assurance and Customer Satisfaction

H1e: There is a positive association between Empathy and Customer Satisfaction

Visitor Type

Types of Visitors to the Restaurant

Tourists are a common visitor type for restaurants (Diaries et al., 2018). They are people who are traveling and visiting a particular area. They often seek out local cuisine and unique dining experiences. Tourists may also have different dietary requirements or food preferences than locals (Vu et al., 2019). Restaurants that cater to tourists often have menus that highlight local specialties, and they may offer a range of international cuisines to appeal to different tastes. Business travelers are another common visitor type for restaurants (Jang et al., 2003) and they are people who are traveling for work and may be in a hurry or have specific dietary needs (Jang et al., 2003). So, restaurants that cater to business travelers often offer quick service and may have a range of healthy options on the menu (McKercher et al., 2008). Additionally, families are another significant visitor type for restaurants (Fleischer & Pizam, 1997). They often visit restaurants to celebrate special occasions or enjoy a family outing (Fleischer & Pizam, 1997). Thus, restaurants that deal with families often have a relaxed and casual atmosphere, with menus that offer a range of options that appeal to both adults and children (Gomez et al., 2018). Another type of visitor is couples that seek out romantic dining experiences (Brochado et al., 2020). As they may be celebrating a special occasion or simply looking for a romantic evening out and restaurants that cater to couples often have an intimate atmosphere, with low lighting and soft music (Brochado et al., 2020). They may also offer special menus or wine pairings to enhance the romantic experience. The other type is solo diners which are becoming increasingly common (Fan & Khattak, 2009). They are people who dine alone and may be seeking out a place to eat that is welcoming and comfortable (Fan & Khattak, 2009). The food outlets that offer services to solo diners often have a bar or communal table where diners can sit and interact with other patrons and they may also offer smaller portion sizes or a range of small plates to make dining alone less intimidating (Goode, 2018). In addition to the above two types, other important visitor types for restaurants are: first-time visitors and repeat visitors.

First-Time and Repeat Visitors

Visitors visiting a destination for the first time are called First time visitors (Fakeye & Crompton, 1991). First-time visitors in a restaurant set-up are those who have never been to that restaurant before and may have heard about the restaurant through word-of-mouth, online reviews, or advertisements. So, they are often seeking an excellent dining experience and may have high expectations (Johns & Kivela, 2008). The first-time visitors were motivated

and enthusiastic to discover and thus took part in a broad range of activities and on the other side the repeat visitors had certain precise aspirations like they love to spend time with family and prefer to shop and dine (Lau & McKercher, 2004). It is observed that restaurants that deal with first-time visitors need to ensure that they offer exceptional food, service as well as atmosphere to make a good first impression (Brochado et al., 2020). Furthermore, repeat visitors are customers who have visited the restaurant before and enjoyed their experience enough to return and they may have a favorite dish or menu item that they always order, or they may be looking to try something new (Lau & McKercher, 2004). Repeat visitors are essential to the success of a restaurant because they often become loyal customers and recommend the restaurant to others (Saad Andaleeb & Conway, 2006). Businesses need to repeat the customers where repeat consumption takes place due to an encouraging attachment to a place (Kunamaneni et al., 2019). Hence, restaurants that cater to repeat visitors need to ensure that they maintain the quality of their food, service, and atmosphere to ensure that customers continue to return (Pantelidis, 2010). Understanding the different visitor types for restaurants is essential for providing a great dining experience; so, to provide services to various types of visitor's restaurants need to offer menus, atmospheres, and services that cater to their specific needs and preferences (Yüksel & Yüksel, 2003; Brown et al., 2020). By doing so, restaurants can ensure that their customers have an enjoyable experience that meets their expectations (Johns & Kivela, 2008). Moreover, understanding the different visitor types for restaurants, including first-time and repeat visitors, is crucial for providing a great dining experience (Johns & Kivela, 2008). Each visitor type has unique needs and preferences that can influence their level of satisfaction with the dining experience (Verma et al., 2000). Therefore, restaurants that understand and cater to these differences can create a loyal customer base and generate positive word-of-mouth recommendations (Kassim & Asiah Abdullah, 2010). By delivering exceptional food, service, and atmosphere that meet the expectations of each visitor type, restaurants can ensure that their customers are satisfied and will surely return for future visits (Tripathi, 2018). It is vital to understand the expectations of various types of visitors coming to a restaurant to understand the levels of their satisfaction because it varies from customer to customer. Hence, to understand the moderating impact of visitor type on the association between service quality dimensions and customer satisfaction the following is hypothesized:

H2: Visitor's type moderates the effect of (H2a) Tangibility, (H2b) Reliability, (H2c) Responsiveness, (H2d) Assurance, and (H2e) Empathy on customer satisfaction.

Customer Loyalty

Loyalty can be viewed through two elements: behavior and attitude (Kandampully & Suhartanto, 2000; Heskett, 2002). The behavioral dimension involves repeat purchases, whereas the attitudinal dimension involves an intention to repurchase and recommend. The existence of true customer loyalty requires a strong attitudinal commitment to a brand (McMullan & Gilmore, 2008). This involves having consistently favorable beliefs and feelings toward the brand, which can be measured through various indicators such as liking the brand and feeling committed to it (Kassim & Asiah Abdullah, 2010). When customers have the intention to repurchase and recommend, they are more likely to remain loyal to a restaurant. Attitudinal dimensions are good indicators of a loyal customer, while behavioral dimensions reflect a customer's preference for a restaurant or service over time (Han & Ryu, 2009; Leninkumar, 2017).

Mediation of Customer Satisfaction:

Research has shown that quality service is a crucial factor in developing customer loyalty, with satisfaction acting as a mediator. Providing a high-quality service that meets or exceeds customer expectations is key to achieving satisfaction and repeat business (Surahman et al., 2020). Customers who are satisfied with a restaurant are more likely to return regularly and actively recommend it to others, spread positive word-of-mouth, and sustain long-term patronage (Shahid Iqbal et al., 2018). While customer satisfaction is important, loyalty should be given even greater attention, as it is the ultimate measure of success in the hospitality industry (Tripathi, 2018). However, the association between customer satisfaction and loyalty is complex and depends on elements like customer attitudes and behavioral intentions. Therefore, satisfaction plays a significant role in developing customer attitudes and intentions, ultimately leading to loyalty and positive recommendation intentions (Namkung & Jang, 2007). Hence, understanding and managing customer satisfaction is crucial for the success of a restaurant business. Various empirical evidences show that quality service dimensions such as tangibles, reliability, responsiveness, empathy, and assurance have positive effects on customer satisfaction (Omar et al., 2016; Nguyen et al., 2018; Song et al., 2022) and satisfaction leads to customer loyalty. The following hypotheses are framed to understand the mediating impact of customer satisfaction on the association between service quality and customer loyalty:

H3: Customer satisfaction positively mediates the relationship of (H3a) Tangibility (H3b) Reliability, (H3c) Responsiveness, (H3d) Assurance, and (H3e) Empathy with customer loyalty.

Research Methodology

Overview

Research for the present study was conducted in North India covering major states i.e. Uttar Pradesh (Agra, Mathura-Vrindavan, Allahabad, and Lucknow), Punjab (Patiala, Ludhiana, Jalandhar, and Chandigarh), Haryana (Karnal, Faridabad, and Kurukshetra) and Delhi NCR (Delhi, Ghaziabad, Noida and Gurugram). The visitors from famous South Indian restaurant chains or restaurants from the mentioned cities were surveyed. The outlets of ‘Sagar Ratna’, ‘DS Dosa Factory’, ‘Sankalp Restaurant’, ‘Moets Coco Palm’, ‘Mr. Idli’ and other famous local South Indian restaurants of the mentioned places were chosen for gastronomic experience analysis of first-time and repeat visitors in terms of their satisfaction and loyalty. A judgmental sampling technique was used to collect the data. To collect the data, 15 to 20 respondents from each South Indian food outlet from the 42 outlets situated in the mentioned 15 cities were surveyed. A total of 712 responses were collected with this method and data was collected through a standardized and structured questionnaire in printed form. All the questions were close-ended and a limited number of options were given to respond. Finally, during the data cleaning process, 338 responses were discarded due to improper fill-up and missing data issues. Finally, 374 responses were found suitable for data analysis.

Measurement Instruments

The statements were framed by using the previous literature and four variables were taken for the assessment of the satisfaction of first-time and repeat customers. The questionnaire was framed based on previous literature and has two sections. The first section comprised socio-demographic details of visitors (gender, age marital status, and place of origin,) and their travel patterns (frequency of traveling). The second section measured the gastronomic experience of the visitors as per their perceived service quality, satisfaction, and loyalty toward the selected food outlets.

All five constructs of perceived service quality were measured by using a SERVQUAL scale adapted from Ahmad et al. (2019). The customer Satisfaction scale was also extracted from Ahmad et al. (2019) and the 4-item scale given by Lai (2019) was used to measure customer loyalty. Questionnaire responses were taken using a 5-point Likert-type scale with strongly disagree as 1 and strongly agree as 5 in a continuum.

Previous researchers had already validated the scales used in this investigation. However, to assess their suitability for the current study, a factor analysis with Varimax rotation was performed. The goal of this research was to reassess the scales' applicability for the current investigation. The exploratory factor analysis (EFA) results showed that all items had factor loadings greater than the minimal criterion of 0.50, indicating their importance for future investigation. Table 1 also includes information on the Kaiser- Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity. A KMO score greater than 0.8 suggests that the sample used in this investigation is adequate. Furthermore, Bartlett's test produced a p-value less than .001, suggesting that the variables comprised are significantly appropriate.

Table-1: KMO and Bartlett's Test

KMO		.806
Bartlett's Test of Sphericity	Approx. Chi-Square	4975.919
	df	406
	Sig.	.000

Source: Authors Input

Data Analysis

IBM SPSS 21 statistical software was used for analyzing the data. To examine the statistical difference between the comments on gastronomic experience between the first-time and return visitors, a t-test analysis was used. Then, the proposed structural model was examined using SEM (structural equation modeling) in AMOS 21.0 (Arbuckle, 2012). AMOS

21.0 was also used for the mediation analysis. The sample size criterion for SEM has been satisfied by keeping a threshold of 200 (Hoogland & Boomsma, 1998; Kline, 2004). Cronbach's alpha and CFA were used to assess the reliability and validity of scales (Hooper et al., 2008; Byrne, 2013).

Findings:

Participants' Profile:

Table 2 shows the demographic characteristics of the respondents. Among the participants in the final sample, 54.4% (n=203) were found to have experienced the South Indian food outlets for the first time, whereas 45.6 percent (n=171) were repeat visitors. However, there was no significant gender difference between the two groups ($\chi^2(1) = .017$, p

=.873). Male participants were somewhat more prevalent among first-time visitors and repeatvisits, with 55.17 percent and 57.3 percent, respectively.

Table- 2: Respondent's demographic profile and comparison of First time and Repeat visitors

Demographic Profile		First-time visitors (n=203)	Repeat visitors (n=171)	X2 (DOF) chi-square	P
Gender	Male	112 (55.17%)	98 (57.3%)	1.16 (1)	0.521
	Female	91 (44.8%)	73 (42.6%)		
Marital Status	Single	104 (51.23%)	68 (39.76%)	1.07 (2)	0.613
	Married	99 (48.76%)	103 (60.23)		
Age	18-30	86 (42.36%)	94 (54.97%)	7.612 (3)	0.002*
	31-50	92 (45.32%)	64 (37.42%)		
	51 or above	25 (12.31%)	13 (7.60%)		
Place of Origin	Gurugram	26 (12.8%)	12 (7.01%)	12.715	0.032*
	Ghaziabad	12 (5.91%)	4 (2.33%)		
	Lucknow	2(0.98%)	42 (24.56%)		
	Faridabad	11(5.41%)	5 (2.92%)		
	Ludhiana	13 (6.40%)	-		
	Kurukshetra	14 (6.89%)	-		
	Mathura-Vrindavan	8 (3.94%)	8 (4.67%)		
	Allahabad	28 (13.79%)	46 (26.90%)		
	Delhi	58 (28.57%)	36 (21.05%)		
	Noida	6 (2.95%)	3 (1.75%)		
	Agra	7 (3.44%)	8 (4.67%)		
	Patiala	4 (1.970%)	2 (1.16%)		
	Ghaziabad	8 (3.94%)	5 (2.92%)		
	Karnal	3 (1.47%)	-		
	Jalandhar	3 (1.47%)	-		

Source: Authors input

There is a significant difference related to different age groups of first-timers and repeatvisitors ($\chi^2(3) = 7.612$, $p = 0.002^*$ where the age group between 18-30 (first-time visitors) was 86(42.36 percent), age group of 31-50 were 92 (45.32 percent) and above 51 were 25 (12.31percent). For the repeat visitors age group of 18-30 was 94 (54.97 percent), between 31-50 the number was 64 (37.42 percent) and 51 or above was 13 (7.60 percent). Concerning marital status, there was an insignificant difference between first-time and repeat visitors ($\chi^2(2) = 1.07$, $p = 0.613$ Single first-time visitors were 104 (51.23 percent) and married 99 (48.76percent) whereas, for the repeat visitors, the single was 68 (39.76%) and the married were 103(60.23 percent). Furthermore, it was found that in terms of place of origin, there was a significant difference between first-time and repeat visitors ($\chi^2(8) = 12.715$, $p = 0.032^*$). Most of the repeat visitors were from Allahabad (26.90 %), Lucknow (24.56 percent), Delhi (21.05 percent), and Gurugram (7.01 percent). Table 3 describes the descriptive statistics of thevariables including mean, standard deviation, and inter-correlation of the variables.

Table-3: Mean, Standard Deviation, and Inter-correlations among Variables

	1	2	3	4	5	6	7
Tangibles	1	.179**	.658**	.944**	.162**	.329**	.248**
Responsiveness		1	.164**	.176**	.943**	.427**	.258**
Reliability			1	.645**	.156**	.413**	.335**
Assurance				1	.164**	.330**	.237**
Empathy					1	.254**	.175*
Satisfaction						1	.261**
Loyalty							1

** = $P < 0.01$ level (2-tailed).

Source: Authors input

Measurement Model and Validity

Confirmatory factor analysis (CFA) was used to examine the overall fit of the model by embracing the opinions of diverse researchers (Boomsma, 2000; McDonald & Ho, 2002; Schreiber, 2008). As advised by Byrne (2013), the goodness-of-fit measurement indices applied in this research, namely GFI, PGFI, CFI, and TLI, offer an indicator of the model's uni-dimensionality. Table 4 shows that all of these indices are above the minimum acceptable limits, and the RMSEA value of 0.071 was found lower than the intended range, suggesting an adequate model fit.

Table-4: Fit statistics of the model

Model Fit	Cut-off Criteria	Model Statistics	Remarks
CMIN		631.754	
DF		356	
CMIN/Df	≤3 (Hair et al., 2010)	1.775	Excellent
GFI	≥.8 (Homburg & Baumgartner, 1995)	.903	Excellent
PGFI	≥.5 (Wu, 2009)	.739	Excellent
CFI	≥.9 (Hair et al., 2010)	.941	Good
TLI	≥.9 (Byrne, 2011)	.933	Good
RMSEA	≤.08 (Steiger, 1990)	.044	Excellent

Source: Authors input

It is also worth noting that all of the regression weights were determined to be greater than 0.6. To establish construct convergent validity, the factor loadings of all statements should be greater than 0.5 (Kline, 2015). Moreover, the composite reliability (CR) and the average variance extracted (AVE) value should be greater than 0.7 (Hair et al., 2010), and 0.5 (Fornell & Larcker, 1981) respectively. Furthermore, as shown in Table 5, the diagonal values were consistently greater than the corresponding values in the respective rows and columns, indicating discriminant validity. Table 5 displays the findings for both convergent and discriminant validity.

Table 5: Convergent and Discriminant Validity Statistic of Variables

	CR	AVE	MSV	MaxR(H)	T	RL	RS	AS	E	CS	CL
T	0.908	0.667	0.059	0.938	0.817						
RL	0.902	0.649	0.059	0.909	0.243	0.805					
RS	0.818	0.530	0.262	0.820	0.125	0.235	0.728				
AS	0.890	0.672	0.262	0.922	0.163	0.073	0.512	0.820			
E	0.825	0.613	0.227	0.848	0.079	0.129	0.338	0.122	0.783		
CS	0.866	0.618	0.227	0.876	0.213	0.186	0.131	0.285	0.476	0.786	
CL	0.921	0.744	0.164	0.944	0.235	0.104	0.221	0.305	0.405	0.211	0.863

(T-Tangibility, RL-Reliability, RS-Responsiveness, AS-Assurance, E-Empathy, CS-Customer Satisfaction, and CL-Customer Loyalty)

Source: Authors input

Gastronomic Experience attributes the difference between First-time and Repeat Visitors:

An independent sample t-test was conducted to understand if there was an effect of first-timers or repeat visitors on five gastronomic experience attributes (service quality). Table 6 reveals the mean of gastronomic experience attributes between the two types of visitors.

Table 6: Means of Gastronomic experience attributes for first-time and repeat visitors

	Mean value		Skewness		Kurtosis		Levene Stat.	p-value	t-value	p-value
	FV	RV	FV	RV	FV	RV				
Tangibility	3.52	4.02	.14	.04	1.13	1.12	9.013	.003	4.85	.000
Reliability	3.42	3.89	.27	.02	1.07	1.04	.919	.338	3.23	.000
Responsiveness	3.60	3.86	.01	.16	1.05	.95	.656	.419	3.77	.000
Assurance	3.33	3.95	1.11	1.44	1.21	1.20	5.810	.016	4.50	.000
Empathy	3.50	3.90	.39	.06	.34	.25	.639	.425	3.04	.000

*Significant at 5% level

Source: Authors input

The findings show a considerable difference in service quality aspects between first-timers and repeat visitors. Tangibility (FV: M=3.52, RV: M=4.02; t=4.85, p<.05), responsiveness (FV: M=3.60, RV: M=3.82; t=3.77, p<.05), reliability (FV: M=3.42, RV: M=3.89; t=3.32, p.05), assurance (FV: M=3.35, RV: M=3.95; t=4.50, p<.05). These findings clearly show that repeat visitors had higher mean ratings, indicating a higher level of agreement in perceiving higher service quality.

Structural Model

The proposed research model was further put for SEM analysis in AMOS after testing the reliability and validity. The structural equation modeling (SEM) study results show a substantial association between service quality aspects and customer satisfaction, confirming the acceptance of all hypotheses. Tangibility (H1a=0.259, p<0.05), reliability (H1b=0.329, p <0.05), responsiveness (H1c= 0.376, p<0.05), assurance (H1d=0.565, p<0.05), and empathy (H1e=0.542, p<0.05) all demonstrate a significant positive relationship with customer satisfaction. Table 7 shows the direct effect results of SEM analysis.

Table 7: Results of Structural Model (Direct Effect)

Hypothesis	Relationships			Estimate	S.E.	C.R.	P	Hypothesis Acceptance
H1a	CS	<--	T	.259	.134	2.107	**	YES
H1b	CS	<--	RL	.329	.059	5.531	***	YES
H1c	CS	<--	RE	.376	.134	2.815	**	YES
H1d	CS	<--	AS	.565	.132	4.280	***	YES
H1e	CS	<--	E	.542	.135	4.009	***	YES

Notes: 1. *** p-value < 0.01; ** p-value < 0.05

(T-Tangibility, RL-Reliability, RS-Responsiveness, AS-Assurance, E-Empathy CS-Customer Satisfaction, and CL-Customer Loyalty)

Source: Authors input

Moderation Analysis

The moderating impact of visitor type was examined to investigate possible statistical variations in perception between the visitors without having any prior experience and recurrent visitors. Table 8 summarizes the data concerning the moderating effect.

Table 8: Moderation Effect of Visitors' Type on Service Quality and Customer Satisfaction

Notes: ** p-value < 0.05

(T-Tangibility, RL-Reliability, RS-Responsiveness, AS-Assurance, E-Empathy, CS-Customer Satisfaction, and CL-Customer Loyalty)

Source: Authors input

Hypotheses	Relationships			First Time		Repeat Visitors		z- score	If z VALUE < 1.96 i.e., no significant difference
				Estimate	P	Estimate	P		
H2a	CS	<--	T	0.798	0.009	0.058	0.727	3.46**	Moderation
H2b	CS	<--	R L	0.429	0.000	0.105	0.365	0.056	No Moderation
H2c	CS	<--	R E	0.613	0.022	0.398	0.019	2.84**	Moderation
H2d	CS	<--	AS	1.197	0.000	0.466	0.004	3.68**	Moderation
H2e	CS	<--	E	0.743	0.006	0.557	0.001	2.60**	Moderation

A multi-group structural equation modeling (SEM) study was also done for both first-time and repeat visitors to explore the association between service quality factors and overall satisfaction among tourists. Table 8 shows the significant moderating effect of visitor type on the association of all service quality attributes, namely tangibility (H2a: Z=3.46), responsiveness (H2c: Z=2.84), assurance (H2d: Z=3.68), and empathy (H2e: Z=2.60), with tourists' overall satisfaction. However, the moderating impact of visitor type on the association between reliability and overall satisfaction was not found to be significant (H2b: Z=0.056). As a result, it can be inferred that there is a considerable moderation of visitors' types on the gourmet experience and customer happiness.

Mediation Analysis

Following the moderation effect study, the model was subjected to mediation analysis to evaluate the function of customer satisfaction as a mediator in the link between service quality and customer loyalty. Table 9 and Figure 1 show the outcomes of the mediation study. Customer satisfaction, according to Hypothesis H3a, mediates the relationship between tangibility and customer loyalty. The findings show that tangibility has a substantial indirect influence on consumer loyalty ($\beta=0.376$, $p<0.05$). The statistical findings partially support hypothesis H3a by demonstrating that, even after accounting for mediation, the direct effect of tangibility on customer loyalty remains considerable. Similarly, the indirect impact of dependability and responsiveness on customer loyalty was shown to be significant in H3b ($\beta=0.045$, $p<0.05$) and H3c ($\beta=0.052$, $p<0.05$). Additionally, the direct effects after mediation remained significant, indicating partial mediation of customer satisfaction in the relationship between reliability and responsiveness with customer loyalty. Furthermore, the mediating role of customer satisfaction between assurance and career satisfaction H3d ($\beta=.079$, $p<0.05$) and empathy and career satisfaction H3e ($\beta=.073$, $p<0.05$) were found to be significant with full mediation as the direct effect after mediation become insignificant.

Table-9: Mediating Role of Customer Satisfaction

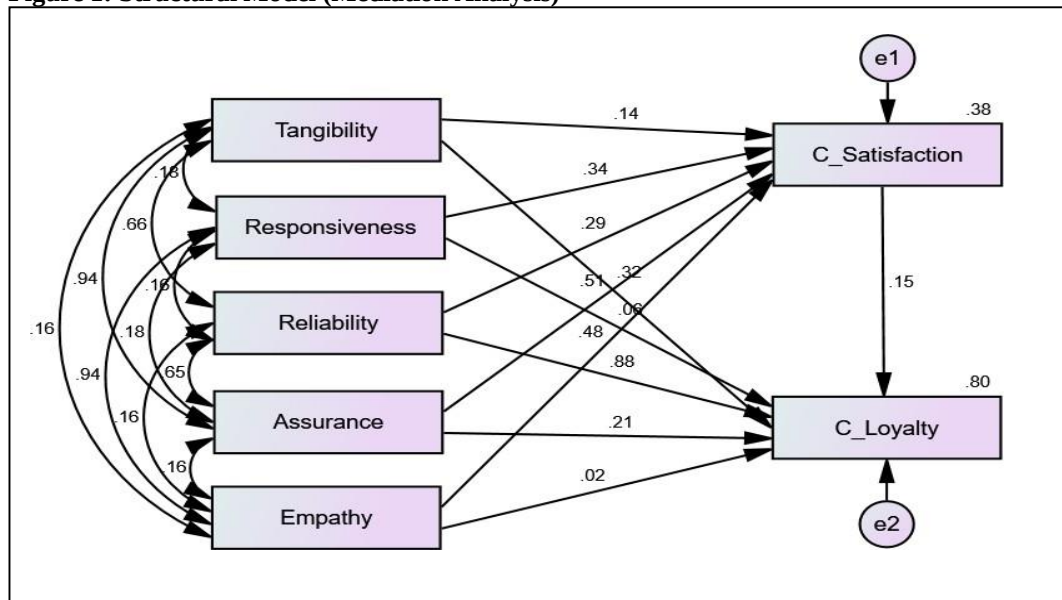
Hypothesis	Relationship (Satisfaction as a mediator)	Total effect	P value	Direct Effect	P value	Indirect effect	P value	Mediation remarks
H3a	T --> CL	.538**	.004	.315**	.004	.376*	.022	Partial
H3b	RL --> CL	.921**	.001	.876**	.001	.045**	.001	Partial
H3c	Rs --> CL	.412**	.008	.657**	.016	.052*	.047	Partial
H3d	As --> CL	.255*	.011	.167	.154	.079**	.002	Full
H3e	Ep --> CL	.179*	.05	.191	.320	.073**	.009	Full

Notes: 1. ** p -value < 0.01; * p -value < 0.05.

(T-Tangibility, RL-Reliability, RS-Responsiveness, AS-Assurance, E-Empathy, CS-Customer Satisfaction, and CL-Customer Loyalty)

Source: Authors input

Figure 1: Structural Model (Mediation Analysis)



Source: Authors input

Discussion

The purpose of this study was to look at the effect of gastronomic experience and service quality on customer satisfaction and loyalty towards prominent South Indian cuisine establishments in North India. The study examined the attitudes of both first-time and return visitors. A moderation and mediation model was created and analyzed to determine the relationship and effect of service quality on customer satisfaction and customer loyalty.

Initially, the study looked at the link between perceived service quality and customer happiness, as well as the perception variations between first-time and return visits to the selected food establishments. The study's

empirical findings show that all service quality parameters have a substantial impact on the overall satisfaction of both first-time and return guests to South Indian restaurants in North India. This supports prior studies (Yüksel & Yüksel, 2003; Namkung & Jang, 2007; Ha & Jang, 2010; Karim & Chi, 2010; Ryu & Han, 2010a) showing total satisfaction is derived from the quality of services provided. High service quality promotes repeat visits and visitor satisfaction and leads to perceived value for money (Yüksel & Yüksel, 2002). These findings are consistent with previous research (Qin & Prybutok, 2009; Hanaysha, 2016). Moreover, customer satisfaction and customer loyalty are also closely interconnected in the restaurant industry. High levels of customer satisfaction often lead to increased customer loyalty, and loyal customers, in turn, contribute significantly to a restaurant's success (Omar et al., 2016; Daengs et al., 2020; Lee & Kim, 2020; Song et al., 2022).

Furthermore, the study looked at the function of customer satisfaction as a mediator. According to research, service quality has a favorable impact on customer satisfaction (Lee, 2011; Thaichon et al., 2014; Vijayvargy, 2014; Su et al., 2016) and influences customer loyalty both directly and indirectly through customer satisfaction (Ladhari, 2009; Daengs et al., 2020; Song et al., 2022). Past research has demonstrated strong correlations between service quality, customer satisfaction, and customer loyalty (Falk et al., 2010; Matos & Rossi, 2009). According to previous research (Lam et al., 2004; Yi & La, 2004; Santouridis & Trivellas, 2010), customer satisfaction plays a significant and positive mediating role in the relationship between service quality and customer loyalty (Yee et al., 2010; Hadi et al., 2016; Slack & Singh, 2019). To foster customer loyalty in the restaurant industry, it's essential to prioritize and consistently deliver exceptional dining experiences, actively seek and respond to customer feedback, and implement customer retention strategies such as loyalty programs, personalized marketing, and engagement initiatives. By doing so, restaurants can not only enhance customer satisfaction but also build a loyal customer base that contributes to long-term success and sustainability.

Conclusion

The current study sought to investigate the effects of gastronomic experience on customer satisfaction and loyalty towards South Indian food outlets in North India while controlling for visitor type. A moderation and mediation model was presented to study the link between service quality, customer satisfaction, and loyalty from both first-time and repeat visitors' viewpoints. The study's findings revealed that all aspects of service quality, including tangibility, dependability, responsiveness, assurance, and empathy, had a substantial impact on the overall satisfaction of visitors to South Indian food outlets in North India. These findings are in line with earlier research. Furthermore, the study found that visitor type moderates the impact of service quality on customer satisfaction, implying that first-time visitors in South Indian food outlets view service quality characteristics differently than recurrent visitors. It was discovered that delivering value for money not only helps visitor happiness but also stimulates repeat visits and client loyalty.

Suggestions

South Indian food outlets must prioritize the improvement of tangible aspects such as the furniture, service and non-service equipment, staff appearance, etc. to entice visitors. The continuous improvements of such tangible aspects will help the outlets in retaining customers. Repeat visitors normally expect to get similar or better services than their previous experience with the restaurant. Hence, it is the sole responsibility of the management to live up to the expectations of their customers and offer reliable service every time so that the customers can be retained. During the service the visitors expect the outlets to address their requests very promptly, may it be during an order or any complaint. A prompt and positive response is always expected from the customers hence the outlets should train their service personnel to be patient and proactive rather than reactive. The staff of restaurants must adopt a sound and stringent customer complaint policy. The South Indian outlets must ensure the taste and delicacies of the most iconic dishes of the South are maintained even if they are served somewhere in the northern region. Various types of visitors come to the South-Indian restaurants serving food in north India including the residents, the South origin people residing in north India, the travelers of South India, and the food lovers from other localities as well. The status, culture, gender, age, and qualification of people also vary prominently, so, it is the responsibility of the service staff to stand on their feet and understand their budget, requirements, consumption patterns, and other expectations of the customers regarding the food services. Hence, the management of the restaurants needs to train their employees so that they can serve all types of visitors as per their requirements. In sum, the research emphasizes the relevance of service quality as a significant factor as a predictor for customer satisfaction and triggering their repeat purchase. It emphasizes the need to provide high-quality services at a cost-effective budget. To encourage repeat visits and long-term customer connections, the chain must continually give great service experiences. Furthermore, the study emphasizes the need for South Indian food outlets to structure their services with the varied viewpoints and expectations of first-time and repeat visitors in mind. The moderating element of visitor type was discovered. This indicates that methods and approaches should be managed according to the demands and preferences of each visitor segment. By recognizing and accommodating these variances, the service quality can successfully increase customer satisfaction and loyalty. The food establishments may provide a great eating experience that may generate repeat business and build long-term customer connections by

concentrating on enhancing service aspects and recognizing the diverse perspectives of different visitor categories.

Implications:

Practical Implications

The findings of this research have substantial management implications for restaurant businesses looking to improve customer satisfaction and loyalty. This study focuses on the management implications of maintaining excellent service quality, taking visitor perceptions into account, and recognizing visitor types for increasing customer satisfaction and loyalty within restaurant chains. South Indian food outlets may improve their overall performance and develop closer ties with their clients by applying these findings. To begin with, it emphasizes the need to maintain good service quality in producing value for money and, eventually, boosting customer satisfaction. Restaurant businesses may enhance it by prioritizing the delivery of great service experiences, which will have a beneficial influence on customer loyalty. Second, the study emphasizes the need to consider visitors' diverse perspectives when developing tactics to increase customer loyalty. Recognizing that first-time and return customers have varied prospects and preferences, the restaurants must customize their offerings. By knowing and responding to these individual demands, they can develop personalized experiences that resonate with each visitor group, promoting a feeling of loyalty and recurring patronage. The restaurant chains must actively study and grasp the characteristics and behaviors of all types of visitors. In this way, they can successfully enhance customer satisfaction and loyalty by adjusting their offerings and tactics to line with the preferences and expectations of these diverse groups.

Theoretical Implications:

The study's findings support the premise that service quality influences both customer satisfaction and loyalty. This is consistent with past research that has emphasized the need for high-quality service to generate favorable customer outcomes. Moreover, the study offers insight into the moderating impact of visitor type, broadening our understanding of the complex interactions between service quality, customer satisfaction, and loyalty. The research improves the existing knowledge base by recognizing the impact of visitor type and emphasizes the need to adjust tactics and experiences to match the varying requirements and expectations of different tourist segments. Furthermore, the novelty of the study is that it proposed a moderation and mediation model which provides a useful foundation for future research in the field of culinary experience. This model provides a systematic approach to investigating the complex links between service quality and loyalty, opening the way for deeper insights and more extensive research in this sector. The findings show the significance of service quality as a driver of customer satisfaction and loyalty, as well as the moderating role of visitor type. The suggested moderation and mediation model provide a strong framework for future study, allowing academics to dive further into the nuances of the link between service quality, customer pleasure, and loyalty in the context of gastronomic experiences.

Limitations and Future Scope

The study has some drawbacks which can be removed in future research studies. First, this study's findings are limited to South Indian food outlets in North India. Cultural and geographical differences might have a varied impact on consumer perceptions and behaviors. So, future research might compare the results of this study with various geographical or cultural contexts to detect potential changes in the impact of the eating experience on customer satisfaction and loyalty. Second, the study has sample size and representativeness constraints. To improve the generalizability of the findings, future studies might use bigger and more varied populations. Third, in the current research, a cross-sectional research design is performed, which restricts the capacity to demonstrate causal links. To enhance causal inferences and establish the temporal sequence of the variables, future research might use longitudinal or experimental approaches. Researchers can acquire insights into the long-term consequences of service quality as well as gourmet experience on customer loyalty by recording visitors' views and subsequent behaviors. Fourth, the study relied on self-reported data, which may induce response bias and subjectivity. Using objective measurements or combining self-report data with observational or objective data might improve the findings' reliability and validity. Lastly, the study might be conducted to investigate customer segmentation based on visitor type and other pertinent criteria. Understanding diverse people's needs, preferences, and expectations of different customer segments can help restaurants tailor their services and offerings categorically, which ultimately helps to enhance customer satisfaction as well as customer loyalty.

References

- Aftab, J., Sarwar, H., Sultan, Q. U. A. & Qadeer, M., (2016).** Importance of service quality in customer satisfaction (A study on fast food restaurants). *Entrepreneurship and Innovation Management Journal*, 4(4), pp. 161-171.
- Ali, B. J., Gardi, B., Jabbar Othman, B., Ali Ahmed, S., Burhan Ismael, N., Abdalla Hamza, P. et al., 2021.** Hotel service quality: The impact of service quality on customer satisfaction in hospitality. *International Journal of Engineering, Business and Management*, 5(3), pp. 14-28. Available at: <https://ssrn.com/abstract=3851330>.
- Al-Tit, A. A., (2015).** The effect of service and food quality on customer satisfaction and hence customer retention. *Asian Social Science*, 11(23), p. 129.
- Arasli, H., Abdullahi, M. & Gunay, T., (2021).** Social media as a destination marketing tool for a sustainable heritage festival in Nigeria: A moderated mediation study. *Sustainability*, 13(11), p. 6191.
- Arbuckle, J.L., (2012).** IBM SPSS AMOS 21 User's Guide. Chicago, IL: IBM.
- Assaker, G., Vinzi, V. E., & O'Connor, P., (2011).** Examining the effect of novelty seeking, satisfaction, and destination image on tourists' return pattern: A two-factor, non-linear latent growth model. *Tourism Management*, 32(4), pp. 890–901. Available at: <https://doi.org/10.1016/j.tourman.2010.08.004>.
- Baviskar, A., (2021).** Street food and the art of survival: migrants and places in Delhi, India. *Food, Culture and Society*, 24(1), pp. 142–155. Available at: <https://doi.org/10.1080/15528014.2020.1859903>.
- Bernstein, I. H. & Nunnally, J. C., (1994).** *Psychometric Theory*. New York: McGraw-Hill.
- Boomsma, A., (2000).** Reporting analyses of covariance structures. *Structural Equation Modeling*, 7(3), pp. 461-483. Available at: https://doi.org/10.1207/S15328007SEM0703_6.
- Brochado, A., Troilo, M., Rodrigues, H. & Oliveira-Brochado, F., (2020).** Dimensions of wine hotel experiences shared online. *International Journal of Wine Business Research*, 32(1), pp. 59–77. Available at: <https://doi.org/10.1108/IJWBR-12-2018-0072>.
- Brown, L., Buhalis, D. & Beer, S., (2020).** Dining alone: improving the experience of solo restaurant goers. *International Journal of Contemporary Hospitality Management*, 32(3), pp. 1347–1365. Available at: <https://doi.org/10.1108/IJCHM-06-2019-0584>.
- Buhalis, D., & Law, R., (2008).** Progress in information technology and tourism management: 20 years on and 10 years after the Internet—The state of eTourism research. *Tourism Management*, 29(4), pp. 609–623. Available at: <https://doi.org/10.1016/j.tourman.2008.01.005>.
- Byrne, B.M., (2013).** *Structural Equation Modeling with Mplus: Basic Concepts, Applications, and Programming*. New York: Routledge.
- Cakici, A. C., Akgunduz, Y. & Yildirim, O., (2019).** The impact of perceived price justice and satisfaction on loyalty: the mediating effect of revisit intention. *Tourism Review*, 74(3), pp. 443-462.
- Chen, C. C., & Petrick, J. F., (2013).** Health and wellness benefits of travel experiences: A literature review. *Journal of Travel Research*, 52(6), pp. 709–719. Available at: <https://doi.org/10.1177/0047287513496477>.
- Cheng, C. C., Chang, Y. Y. & Chen, C. T., 2021.** Construction of a service quality scale for the online food delivery industry. *International Journal of Hospitality Management*, 95, p. 102938. Available at: <https://doi.org/10.1016/j.ijhm.2021.102938>.
- Cheng, M., & Edwards, D., (2019).** A philosophical inquiry into the ontology of peer-to-peer accommodation. *Annals of Tourism Research*, 75, pp. 30–39. Available at: <https://doi.org/10.1016/j.annals.2018.12.001>.
- Chu, R. K., & Choi, T., (2000).** An importance-performance analysis of hotel selection factors in the Hong Kong hotel industry: A comparison of business and leisure travelers. *Tourism Management*, 21(4), pp. 363–377. Available at: [https://doi.org/10.1016/S0261-5177\(99\)00070-9](https://doi.org/10.1016/S0261-5177(99)00070-9).
- Cohen, S. A., Prayag, G., & Moital, M., (2014).** Consumer behaviour in tourism: Concepts, influences and opportunities. *Current Issues in Tourism*, 17(10), pp. 872–909. Available at: <https://doi.org/10.1080/13683500.2013.850064>.
- Crompton, J. L., (1979).** Motivations for pleasure vacation. *Annals of Tourism Research*, 6(4), pp. 408–424. Available at: [https://doi.org/10.1016/0160-7383\(79\)90004-5](https://doi.org/10.1016/0160-7383(79)90004-5).

- Daengs, G. S., Istanti, E., Negoro, R. M. & Sanusi, R., (2020).** The aftermath of management actions on competitive advantage through process attributes at food and beverage industries export import in Perak Harbor of Surabaya. *International Journal of Criminology and Sociology*, 9, pp. 1418-1425.
- Daries, N., Cristobal-Fransi, E., Ferrer-Rosell, B. & Marine-Roig, E., (2018).** Behaviour of culinary tourists: A segmentation study of diners at top-level restaurants. *Intangible Capital*, 14(2), pp. 332–355. Available at: <https://doi.org/10.3926/ic.1090>.
- Dolnicar, S., (2002).** A review of data-driven market segmentation in tourism. *Journal of Travel & Tourism Marketing*, 12(1), pp. 1–22. Available at: https://doi.org/10.1300/J073v12n01_01.
- El-Adly, M. I., (2019).** Modelling the relationship between hotel perceived value, customer satisfaction, and customer loyalty. *Journal of Retailing and Consumer Services*, 50, pp. 322-332. Available at: <https://doi.org/10.1016/j.jretconser.2018.07.007>.
- Fakeye, P. C. & Crompton, J. L., (1991).** Image Differences between Prospective, First-Time, and Repeat Visitors to the Lower Rio Grande Valley. *Journal of Travel Research*, 30(2), pp. 10–16. Available at: <https://doi.org/10.1177/004728759103000202>.
- Fan, Y. & Khattak, A. J., (2009).** Does urban form matter in solo and joint activity engagement? *Landscape and Urban Planning*, 92(3–4), pp. 199–209. Available at: <https://doi.org/10.1016/j.landurbplan.2009.05.006>.
- Fennell, D. A., (2014).** Exploring the boundaries of a new moral order for tourism's global code of ethics: An opinion piece on the position of animal ethics. *Journal of Sustainable Tourism*, 22(7), pp. 983–996. Available at: <https://doi.org/10.1080/09669582.2014.918134>.
- Fesenmaier, D. R., & Xiang, Z., (2017).** A model of destination advertising: The case of Visit Jordan. *Journal of Travel Research*, 56(5), pp. 624–640. Available at: <https://doi.org/10.1177/0047287516643414>.
- Fleischer, A. & Pizam, A., (1997).** Rural tourism in Israel. *Tourism Management*, 18(6), pp. 367–372. Available at: [https://doi.org/10.1016/S0261-5177\(97\)00034-4](https://doi.org/10.1016/S0261-5177(97)00034-4).
- Frochot, I., & Morrison, A. M., (2000).** Benefit segmentation: A review of its applications to travel and tourism research. *Journal of Travel & Tourism Marketing*, 9(4), pp. 21–45. Available at: https://doi.org/10.1300/J073v09n04_02.
- Giampiccoli, A. & Kalis, J. H., (2012).** Tourism, food, and culture: Community-based tourism, local food, and community development in Pondoland. *Culture, Agriculture, Food and Environment*, 34(2), pp. 101-123.
- Gomez, J. M., Ruiz, M. R. & Mele, P. M., (2018).** Vegetarian restaurants as a determining factor of the vegetarian tourist's destination choice. *European Journal of Family Business*, 8(1), pp. 69–79. Available at: <https://doi.org/10.24310/ejfbefb.v8i1.5005>.
- Goode, J., (2018).** Being one's own honoured guest: Eating out alone as gendered sociality in public spaces. *Sociological Research Online*, 23(1), pp. 100–113. Available at: <https://doi.org/10.1177/1360780418754566>.
- Gopi, B. & Samat, N., (2020).** The influence of food trucks' service quality on customer satisfaction and its impact toward customer loyalty. *British Food Journal*, 122(10), pp. 3213-3226. Available at: <https://doi.org/10.1108/BFJ-02-2020-0110>.
- Gössling, S., (2002).** Human-environmental relations with tourism. *Annals of Tourism Research*, 29(2), pp. 539–556. Available at: [https://doi.org/10.1016/S0160-7383\(01\)00075-6](https://doi.org/10.1016/S0160-7383(01)00075-6).
- Gössling, S., Scott, D., & Hall, C. M., (2015).** Inter-market variability in CO₂ emissions due to tourism: Implications for destination marketing and climate change mitigation. *Tourism Management*, 46, pp. 73–82. Available at: <https://doi.org/10.1016/j.tourman.2014.06.022>.
- Hadi, N.U., Abdullah, N. & Sentosa, I., (2016).** Making sense of mediating analysis: a marketing perspective. *Review of Integrative Business and Economics Research*, 5(2), pp. 62-76.
- Hair, J. F., Black, W. C., Babin, B. J. & Anderson, R. E., (2010).** *Multivariate Data Analysis: International Version*. New Jersey: Pearson.
- Han, H. & Ryu, K., (2009).** The roles of the physical environment, price perception, and customer satisfaction in determining customer loyalty in the restaurant industry. *Journal of Hospitality and Tourism Research*, 33(4), pp. 487–510. Available at: <https://doi.org/10.1177/1096348009344212>.
- Hanaysha, J., (2016).** Testing the effects of food quality, price fairness, and physical environment on customer satisfaction in fast food restaurant industry. *Journal of Asian Business Strategy*, 6(2), pp. 31-40.

- Heskett, J. L., (2002).** Beyond customer loyalty. *Managing Service Quality: An International Journal*, 12(6), pp. 355-357. Available at: <https://doi.org/10.1108/09604520210451830>.
- Hildebrandt, F. D. & Ulmer, M. W., (2022).** Supervised Learning for Arrival Time Estimations in Restaurant Meal Delivery. *Transportation Science*, 56(4), pp. 1058-1084. Available at: <https://doi.org/10.1287/trsc.2021.1095>.
- Hoogland, J. & Boomsma, A., (1998).** Robustness studies in covariance structure modeling: An overview and a meta-analysis. *Sociological Methods & Research*, 26(3), pp. 329-367. Available at: <https://doi.org/10.1177/0049124198026003003>.
- Huete-Alcocer, N., (2017).** A literature review of word of mouth and electronic word of mouth: Implications for consumer behavior. *Frontiers in Psychology*, 8, p. 1256. Available at: <https://doi.org/10.3389/fpsyg.2017.01256>.
- Islam, J. U., Zahra, S. A. & Tarhini, A., (2017).** Determinants of continuance intention to use online booking applications: Extending the expectation-confirmation model. *Tourism Review*, 72(3), pp. 344-360. Available at: <https://doi.org/10.1108/TR-11-2016-0049>.
- Jaafar, M., Rasoolimanesh, S. M., Ismail, S. & Lonik, K. A. T., (2015).** Tourism growth and entrepreneurship: Empirical analysis of development of rural highlands. *Tourism Management Perspectives*, 14, pp. 17-24. Available at: <https://doi.org/10.1016/j.tmp.2015.02.001>.
- Jamal, T., & Getz, D., (1995).** Collaboration theory and community tourism planning. *Annals of Tourism Research*, 22(1), pp. 186-204. Available at: [https://doi.org/10.1016/0160-7383\(94\)00067-3](https://doi.org/10.1016/0160-7383(94)00067-3).
- Jones, T. & Taylor, S. F., (2007).** The conceptual domain of service loyalty: How many dimensions? *Journal of Services Marketing*, 21(1), pp. 36-51. Available at: <https://doi.org/10.1108/08876040710726284>.
- Joppe, M., (2012).** Migrant workers: Challenges and opportunities in addressing tourism labour shortages. *Tourism Management*, 33(3), pp. 662-671. Available at: <https://doi.org/10.1016/j.tourman.2011.07.009>.
- Kandampully, J., Zhang, T. & Jaakkola, E., (2018).** Customer experience management in hospitality. *International Journal of Contemporary Hospitality Management*, 30(1), pp. 21-56. Available at: <https://doi.org/10.1108/IJCHM-10-2015-0617>.
- Kim, J. H., Ritchie, J. B., & McCormick, B., (2012).** Development of a scale to measure memorable tourism experiences. *Journal of Travel Research*, 51(1), pp. 12-25. Available at: <https://doi.org/10.1177/0047287510385467>.
- Kim, J. H., Ritchie, J. R. B. & McCormick, B., (2012).** Development of a scale to measure memorable tourism experiences. *Journal of Travel Research*, 51(1), pp. 12-25. Available at: <https://doi.org/10.1177/0047287510385467>.
- Kozak, M. & Rimmington, M., (2000).** Tourist satisfaction with Mallorca, Spain, as an off-season holiday destination. *Journal of Travel Research*, 38(3), pp. 260-269. Available at: <https://doi.org/10.1177/004728750003800308>.
- Kozak, M., & Baloglu, S., (2011).** Managing and marketing tourist destinations: Strategies to gain a competitive edge. *Journal of Destination Marketing & Management*, 1(1), pp. 1-7. Available at: <https://doi.org/10.1016/j.jdmm.2011.10.001>.
- Kozak, M., (2001).** Repeaters' behavior at two distinct destinations. *Annals of Tourism Research*, 28(3), pp. 784-807. Available at: [https://doi.org/10.1016/S0160-7383\(00\)00078-5](https://doi.org/10.1016/S0160-7383(00)00078-5).
- Krejcie, R. V. & Morgan, D. W., (1970).** Determining sample size for research activities. *Educational and Psychological Measurement*, 30(3), pp. 607-610. Available at: <https://doi.org/10.1177/001316447003000308>.
- Kuo, Y.-F., Hu, T.-L. & Yang, S.-C., (2013).** Effects of inertia and satisfaction in female online shoppers on repeat-purchase intention. *Managing Service Quality*, 23(3), pp. 168-187. Available at: <https://doi.org/10.1108/09604521311312219>.
- Lai, I. K. W., Hitchcock, M., Yang, T. & Lu, T. L., (2018).** Literature review on service quality in hospitality and tourism (1984-2014): Future directions and research implications. *International Journal of Contemporary Hospitality Management*, 30(1), pp. 114-159. Available at: <https://doi.org/10.1108/IJCHM-10-2015-0594>.
- Lee, C. K., & Han, S. Y., (2002).** Estimating the use and preservation values of national parks' tourism resources using a contingent valuation method. *Tourism Management*, 23(5), pp. 531-540. Available at: [https://doi.org/10.1016/S0261-5177\(02\)00010-9](https://doi.org/10.1016/S0261-5177(02)00010-9).

- Lee, H., Lee, Y. & Yoo, D., (2000).** The determinants of perceived service quality and its relationship with satisfaction. *Journal of Services Marketing*, 14(3), pp. 217–231. Available at: <https://doi.org/10.1108/08876040010327220>.
- Lee, T. H., (2011).** How recreation involvement, place attachment and conservation commitment affect environmentally responsible behavior. *Journal of Sustainable Tourism*, 19(7), pp. 895–915. Available at: <https://doi.org/10.1080/09669582.2011.570345>.
- Leiper, N., (1979).** The framework of tourism: Towards a definition of tourism, tourist, and the tourist industry. *Annals of Tourism Research*, 6(4), pp. 390–407. Available at: [https://doi.org/10.1016/0160-7383\(79\)90003-3](https://doi.org/10.1016/0160-7383(79)90003-3).
- Lin, L.-P., (2021).** The effect of service quality on customer satisfaction in online booking platform: A case study of traveloka. *International Journal of Innovation, Creativity and Change*, 15(4), pp. 283–293.
- Liu, Z., (2003).** Sustainable tourism development: A critique. *Journal of Sustainable Tourism*, 11(6), pp. 459–475. Available at: <https://doi.org/10.1080/09669580308667216>.
- MacCannell, D., (1976).** *The Tourist: A New Theory of the Leisure Class*. Berkeley, CA: University of California Press.
- McCabe, S., (2009).** Who needs a holiday? Evaluating social tourism. *Annals of Tourism Research*, 36(4), pp. 667–688. Available at: <https://doi.org/10.1016/j.annals.2009.06.005>.
- Min, S., Kim, J. & Kim, S. S., (2019).** Online-to-offline strategies, consumer value co-creation, and customer satisfaction in the hotel industry. *International Journal of Hospitality Management*, 77, pp. 235–246. Available at: <https://doi.org/10.1016/j.ijhm.2018.06.015>.
- Morrison, A. M., (2013).** *Marketing and Managing Tourism Destinations*. London: Routledge.
- Oliver, R. L., (1999).** Whence consumer loyalty? *Journal of Marketing*, 63, pp. 33–44. Available at: <https://doi.org/10.1177/00222429990634s105>.
- Parasuraman, A., Zeithaml, V. A. & Berry, L. L., (1988).** SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, 64(1), pp. 12–40.
- Preacher, K. J. & Hayes, A. F., (2008).** Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40(3), pp. 879–891. Available at: <https://doi.org/10.3758/BRM.40.3.879>.
- Quinn, B., (2006).** Problematising “festival tourism”: Arts festivals and sustainable development in Ireland. *Journal of Sustainable Tourism*, 14(3), pp. 288–306. Available at: <https://doi.org/10.1080/09669580608669063>.
- Reisinger, Y. & Turner, L., (1997).** Cross-cultural differences in tourism: A strategy for tourism marketers. *Journal of Travel & Tourism Marketing*, 6(3–4), pp. 79–106. Available at: https://doi.org/10.1300/J073v06n03_05.
- Ryan, C., (1995).** *Researching Tourist Satisfaction: Issues, Concepts, Problems*. London: Routledge.
- Ryu, K., Han, H. & Jang, S., (2010).** Relationships among hedonic and utilitarian values, satisfaction, and behavioral intentions in the fast-casual restaurant industry. *International Journal of Contemporary Hospitality Management*, 22(3), pp. 416–432. Available at: <https://doi.org/10.1108/09596111011035981>.
- Shaw, G., & Williams, A. M., (2009).** Knowledge transfer and management in tourism organizations: An emerging research agenda. *Tourism Management*, 30(3), pp. 325–335. Available at: <https://doi.org/10.1016/j.tourman.2008.02.023>.
- Smith, V. L., (1977).** *Hosts and Guests: The Anthropology of Tourism*. Philadelphia, PA: University of Pennsylvania Press.
- Sørensen, F., (2007).** The geographies of social networks and innovation in tourism. *Tourism Geographies*, 9(1), pp. 22–48. Available at: <https://doi.org/10.1080/14616680601092857>.
- Tanford, S. & Montgomery, R., (2015).** The effects of social influence and cognitive dissonance on travel purchase decisions. *Journal of Travel Research*, 54(5), pp. 596–610. Available at: <https://doi.org/10.1177/0047287514528287>.
- Trinh, H. T. & Ryan, C., (2017).** Visitors to heritage sites: motivations and emotions in Angkor Wat, Cambodia. *International Journal of Tourism Research*, 19(6), pp. 726–735. Available at: <https://doi.org/10.1002/jtr.2144>.

Tussyadiah, I. P., & Pesonen, J., (2018). Drivers and barriers of peer-to-peer accommodation stay – an exploratory study with American and Finnish travelers. *Current Issues in Tourism*, 21(6), pp. 703–720. Available at: <https://doi.org/10.1080/13683500.2016.1141180>.

Urry, J., (2002). *The Tourist Gaze*. 2nd ed. London: SAGE.

Wang, D., Park, S. & Fesenmaier, D. R., (2012). The role of smartphones in mediating the touristic experience. *Journal of Travel Research*, 51(4), pp. 371–387. Available at: <https://doi.org/10.1177/0047287511426341>.

Wang, Y. & Davidson, M. C., (2010). Pre- and post-trip perceptions: An insight into Chinese package holiday market to Australia. *Journal of Vacation Marketing*, 16(2), pp. 111–123. Available at: <https://doi.org/10.1177/1356766710364542>.

Williams, A. M., & Shaw, G., (2009). Future play: Tourism, technology, and sustainability. *Tourism Recreation Research*, 34(3), pp. 279–291. Available at: <https://doi.org/10.1080/02508281.2009.11081600>.

Woodside, A. G., & King, R. I., (2001). An updated model of travel and tourism decision making. *Journal of Travel & Tourism Marketing*, 10(1), pp. 95–113. Available at: https://doi.org/10.1300/J073v10n01_06.

World Tourism Organization (UNWTO), (2020). International tourism highlights, 2020 edition. Madrid: UNWTO. Available at: <https://www.e-unwto.org/doi/book/10.18111/9789284422456>.

Wu, H.-C., Li, T., & Li, M.-Y., (2014). A study of experiential quality, tourist satisfaction, and destination loyalty among Chinese tourists in Taiwan. *Tourism Management Perspectives*, 19, pp. 80–90. Available at: <https://doi.org/10.1016/j.tmp.2016.01.013>.

Xiang, Z., Wang, D., O’Leary, J. T., & Fesenmaier, D. R., (2015). Adapting to the Internet: Trends in travelers’ use of the web for trip planning. *Journal of Travel Research*, 54(4), pp. 511–527. Available at: <https://doi.org/10.1177/0047287514522883>.

Yoo, M., Lee, S., & Bai, B., (2011). Hospitality marketing research from 2000 to 2009. *International Journal of Contemporary Hospitality Management*, 23(4), pp. 517–532. Available at: <https://doi.org/10.1108/09596111111129996>.

Yuan, J., & McDonald, C., (2020). Understanding tourists' cultural experience through online reviews: A case study of the Louvre museum. *Tourism Management*, 82, p. 104205. Available at: <https://doi.org/10.1016/j.tourman.2020.104205>.

Zeithaml, V. A., (1988). Consumer perceptions of price, quality, and value: A means-end model and synthesis of evidence. *Journal of Marketing*, 52(3), pp. 2–22. Available at: <https://doi.org/10.1177/002224298805200302>.

Zeithaml, V. A., Bitner, M. J., & Gremler, D. D., (2006). *Services Marketing: Integrating Customer Focus Across the Firm*. 4th ed. New York: McGraw-Hill.

Zeng, B., & Gerritsen, R., (2014). What do we know about social media in tourism? A review. *Tourism Management Perspectives*, 10, pp. 27–36. Available at: <https://doi.org/10.1016/j.tmp.2014.01.001>.

Zhang, H. Q., & Chow, I., (2004). Application of importance–performance model in tour guides' performance: Evidence from mainland Chinese outbound visitors in Hong Kong. *Tourism Management*, 25(1), pp. 81–91. Available at: [https://doi.org/10.1016/S0261-5177\(03\)00064-5](https://doi.org/10.1016/S0261-5177(03)00064-5).

Zhang, J. J., & Mao, Z., (2012). Image of all-for-one tourism destinations from online reviews: A case of Lake George, NY. *Journal of Travel & Tourism Marketing*, 35(3), pp. 339–354. Available at: <https://doi.org/10.1080/10548408.2018.1487368>.

Zins, A. H., (2010). Design and methods of tourism consumer behavior research. *Annals of Tourism Research*, 37(1), pp. 197–213. Available at: <https://doi.org/10.1016/j.annals.2009.09.002>.

Zins, A. H., (2002). Consumption emotions, experience quality and satisfaction: A structural analysis for complementary segments and occasions. *Journal of Travel Research*, 41(3), pp. 251–266. Available at: <https://doi.org/10.1177/0047287502239037>.

Employee Well-Being in Optimising Performance at Workplace: A Bibliometric Perspective and Future Research Direction

Dr. Vandana Sharma

Assistant Professor,
Department of
Management Studies,
Deenbandhu Chhotu Ram
University of Science and
Technology, Murthal,
Haryana, India

Ms. Vidhu Vats

Research Scholar,
Department of Management
Studies,
Deenbandhu Chhotu Ram
University of Science and
Technology, Murthal,
Haryana, India

Mr. Gourav

Research Scholar,
Department of Management
Studies,
Deenbandhu Chhotu Ram
University of Science and
Technology, Murthal,
Haryana, India

Abstract

Nowadays, organizations understand the importance of human intellectual capital for achieving sustainable growth in highly competitive markets and hostile business environments. Organizations must ensure employees are happy and satisfied to have more productive human intellectual capital. Now, organizations are implementing employee well-being strategies to make their employees happy and comfortable, as employees benefit from well-being strategies and perform better. Researchers have studied the myriad dimensions of employee well-being in previous research. Our study aims to synthesize the research on employee well-being with particular reference to its impact on employee performance. Our study combines a systematic literature review and bibliometric analysis. We systematically analysed a sample of 191 articles identified from the Scopus database and other sources to explore the research growth in the last 25 years. Bibliometric analysis determined the publication trend, most influential authors, journals, cited studies and key affiliations. We have identified research clusters based on content analysis of the last five years of research papers (2018-2022) included in the study. We identified clusters and named them according to the commonality of research themes among them. The study will help researchers, organizations, and policymakers understand the importance of employee well-being. It also facilitates researchers with future scope of research through the identified research gaps.

Keywords: Employee Well-Being, Performance, Bibliometrics Analysis, SLR, High-Performance Work System (HPWS), Work-Life Conflicts (WLC), Leadership

Introduction

Employee well-being was first expressed in the early Human Resource Management (HRM) literature by Beer (1984) as the long-term consequences of HR policies. According to Stoll (2014), well-being has roots in ancient Greek history. The concept was developed as a philosophy of the good life and later conceptualised as a religious term. Nevertheless, the extensive empirical research work turned well-being into a scientific concept. Employee well-being is a broad concept that describes how an employee experiences and functions at work (Guest, 2017). However, researchers have yet to reach a consensus on the definition of employee well-being (Page & Vella-Brodrick, 2009) because employee well-being is a subjective concept which means “several things to different people” (Danna & Griffin, 1999; Wright & Huang, 2012). Wellbeing is a broad term that can be measured in terms of life satisfaction, happiness, leisure, health, job satisfaction, job strain, engagement, and depression (Warr & Nielsen, 2018). Ogbonnaya (2019) expanded the concept of well-being to include satisfaction, enthusiasm, health and future scope to include feelings of organizational belongingness for future studies. The main dimensions of employee well-being include psychological, physical and social well-being (Grant et al., 2007; Van De Voorde, Paauwe and Van Veldhoven, 2012). While psychological well-being focuses on subjective experiences and functioning at work, physical well-being outlines well-being in terms of physical health and social well-being refers to the quality of a person’s relationships with other people and communities (Grant et al., 2007; Van De Voorde et al., 2012; Nielsen et al., 2017). Hauff et al. (2022) proposed a broader approach to well-being through physical and mental health, job satisfaction and work engagement.

For last two decades, research work in the field of human resources has been directed toward employee-centred outcomes like employee well-being, to find the effect of HR practices on the well-being of employees (Jiang et al., 2012) because both policymakers and Human Resources (HR) professionals consider employee well-being as a critical outcome. Many studies recommended the implementation of well-being strategies because of their positive impact on organizational outcomes such as enhanced performance and reduced cost (Guest, 2017; Kundi et al., 2020; Benitez & Medina, 2022). The link between well-being and health and productivity was observed closely with subjective measures of performance assessment i.e., ratings by supervisors, colleagues and

research participants (Warr & Nielsen, 2018), but the researchers rarely measured objective measures (sales and actual output) for employee performance. Healthy and happy employees had a better quality of life, lower risk of illness and injury and increased work productivity. Employees experiencing higher well-being were more likely to contribute to their communities than employees with less well-being (Hamar et al., 2015). According to the Harvard Business Review service analysis report (2013), employees with good physical, mental and emotional health are more likely to perform optimally in the workplace than those without. Global Happiness and Well-being Policy Report by Global Happiness Council (2019) further claim that there is a direct relationship between employee well-being and productivity. Global Human Capital Trends survey by Deloitte (2020) found that 80 per cent of organizations express that employee well-being is essential to their success. As per the research by Oxford University, happy workers are 13% more productive (Bellet et al., 2019). Gallup's State of the Global Workplace 2022 Report, which analysed 112,312 business units in 96 countries found a strong link between well-being and performance outcomes such as employee retention, productivity, safety and profitability.

The COVID-19 pandemic has resulted in sudden and unexpected changes to work practices which, in turn, has created uncertainties for employees and affected their well-being (Oakman et al., 2020). Employees stressed by COVID-19 experienced depression and could not focus on their work, resulting in reduced performance (Yunita & Saputra, 2019). A study by a HR service provider firm named 'The 7th Fold', "36 per cent of employees in India reported that their mental health worsened when they settled into a new style of working from home" (7th Fold, HR-firm, 2020). A survey by Oracle (2020) claims that 84 per cent of people experienced more stress and anxiety at work, and approximately 85 per cent of people reported that mental health issues at work negatively affected their personal lives.

Employee well-being is multifarious and directly relates to individual and organizational performance. At the same time, employees face well-being related issues (anxiety, stress and health issues) at the workplace. Therefore, it is necessary to investigate interventions that can improve the quality of employee well-being in organizations. The sudden evoke of COVID-19 worsened the situation and got the attention of scholars toward employee well-being research. Therefore, our study aims to synthesize the literature work in the area of employee well-being in optimizing performance at the workplace. For this, we first searched for quality literature and then performed contextualised SLR and bibliometric analysis to gain insights into the publication trends of well-being research. Then, the literature published in the last five years was analysed to identify the research themes and future research directions.

Hence, our paper aims to find out the following research questions –

- What is the current publication trend in employee well-being with particular reference to performance?
- Who are the most influential authors and their research papers?
- What are this area's most influential journals, publishers and affiliations?
- What is the intellectual structure and revealing significant themes in this area of research?

Research Objectives

- To know about the publication trend of topic-related literature.
- To know about the significant authors and their research articles contributing to the topic.
- To know about the significant journals, publishers and affiliations.
- To find out significant research themes and intellectual structure of this research area.
- To identify the gaps for future research.

Rationale for the study

Employee well-being has been a buzzing term among HR professionals and researchers for many years. But the term gained momentum after COVID-19 when every employee suffered from uncertainty, stress, health issues and work-life imbalances. Despite this, we found a meagre count of studies summarizing the research on employee well-being. 'Thirty-Eight Years of 'Wellbeing' Research: Bibliometric Analysis of Open Access Documents' by Ali et al. (2021) is the most recent work related to well-being that did a bibliometric analysis of open access documents only and did not cover any specific dimension of well-being. 'Mindfulness and Well-being: A Bibliometric Analysis' by Rusdi and Wibowo (2021) did a bibliometric analysis of well-being with the dimension mindfulness. 'Workplace resources to improve employee well-being and performance: A systematic review and meta-analysis' by Nielsen et al. (2017) studied 84 quantitative studies only. 'A systematic and bibliometric review of the financial well-being: Advancements in the current status and future research agenda' (2022) by Singh and Malik studied only the financial dimension of well-being.

Our study differs from all other studies in many aspects, we have done comprehensive research on well-being covering all forms of well-being like financial, physical and psychological well-being, with performance as the research dimension. We have used the Scopus database to ensure the quality and wide coverage of literature on employee well-being. We did not have limitations like the use of open-access documents only. To be specific about the organizational perspective, we had included 'employee well-being' as a search term rather than using

‘well-being’ only. We have not found any study that is specific to the organizational perspective, covering all forms of well-being and linking employee well-being with performance.

Research Methodology

In the study, we have used a blend of contextualised SLR (systematic literature review), bibliometric and content analysis to analyse the rigorous research growth over a while and future research scope in the area of ‘employee well-being and performance’. We first performed contextualised SLR to search the data for bibliometric analysis by defining the search terms for retrieving data from the Scopus Database. Then, we systematically extracted the papers to be studied using the PRISMA approach to set our inclusion and exclusion criteria. In the second stage, we analysed the extracted data using bibliometric analysis. According to Donthu et al. (2021), ‘Bibliometric analysis is an effective method of summarising and synthesising literature’. We have applied bibliometric analysis to analyse the publication trend, key author analysis, journal analysis, affiliation analysis, country analysis and document analysis. We have used Biblioshiny, a software package by RStudio (Aria & Cuccurullo, 2017) and VOS viewer for bibliometric analysis. Further, in the third stage, we did the content analysis of the literature retrieved in the first stage in collaboration with the keyword analysis done using bibliometric analysis. Our content analysis has uncovered evolving research clusters and identified gaps for future research.

Defining search terms

Our topic consisted of two significant terms: well-being and performance. To ensure our search results align with our research focus on business organizations, we employed the association of the term 'employee' with 'well-being.' This step was necessary because searching solely with the keyword 'well-being' yielded a substantial number of articles that lacked a specific organizational perspective. By using various search terms, we discovered that many authors use the two words ‘wellbeing’ and ‘well-being’ as synonyms. We used two search strings to ensure both inclusions, i.e., ‘employee well-being and performance’ or ‘employee wellbeing and performance’.

Search delimiting criteria

Our last search with the defined search strings was done on the 'SCOPUS' database on 15th June 2023 (Figure 1). We included the records of the last 25 years, i.e., 1998-2022 and got 685 records. To reduce the number of records and maintain the inclusion of highly relevant records, we further refined the results based on the subject area by eliminating records from unrelated areas like; agriculture, physics, chemicals, astronomy, energy etc. The search was then refined based on the document type by eliminating books, book chapters, and news. Only articles, reviews and conference papers were included. To ensure the feasibility of reading, we included the papers available in English only. After all refining and elimination, we were finally left with 472 documents (Table 1). Then we included 56 papers from other sources like Google Scholar, Research Gate, and Academia. Lastly, we had 528 identified records.

```
(TITLE-ABS-KEY("EMPLOYEE WELLBEING" AND "PERFORMANCE") OR TITLE-ABS-KEY("EMPLOYEE WELL-
BEING" AND "PERFORMANCE")) AND ( EXCLUDE ( SUBJAREA,"ENGI" ) OR EXCLUDE ( SUBJAREA,"COMP" )
OR EXCLUDE ( SUBJAREA,"ENER" ) OR EXCLUDE ( SUBJAREA,"MATH" ) OR EXCLUDE ( SUBJAREA,"NURS" )
OR EXCLUDE ( SUBJAREA,"PHAR" ) OR EXCLUDE ( SUBJAREA,"EART" ) OR EXCLUDE ( SUBJAREA,"BIOC" )
OR EXCLUDE ( SUBJAREA,"AGRI" ) OR EXCLUDE ( SUBJAREA,"NEUR" ) OR EXCLUDE ( SUBJAREA,"PHYS" )
OR EXCLUDE ( SUBJAREA,"MATE" ) OR EXCLUDE ( SUBJAREA,"CENG" ) OR EXCLUDE ( SUBJAREA,"VETE" )
) AND ( LIMIT-TO ( DOCTYPE,"AR" ) OR LIMIT-TO ( DOCTYPE,"RE" ) ) AND ( LIMIT-TO (
LANGUAGE,"ENGLISH" ) ) AND ( EXCLUDE ( SUBJAREA,"ENVT" ) )
```

Figure 1. Screenshot of search strings used by SCOPUS database to retrieve data.

Source: SCOPUS Database

Table 1: Delimiting the data collected from database

Stage	Filtering criteria	Eliminated	Accepted
1	Initial retrieval result (1998-2022)	-----	685
2	Subject area (Business, finance, psychology and related area)	147	538
3	Article, review, conference papers	57	481
4	Language filter (English)	09	472

Data retrieval for bibliometric and systematic review

To delimit the count of literature and to maintain relevance, 528 identified works of literature were further screened by analysing the keywords and abstract, as shown in Figure 2, using the PRISMA approach. To focus

our analysis on the relationship between employee well-being and performance, we excluded records that did not specifically examine this connection. However, we retained literature that established the foundational concepts of employee well-being to ensure a comprehensive understanding of the topic. The second refining stage included accessing the full-text papers and eliminating those articles whose objectives did not match our study's requisites. A few of the papers were inaccessible and thus eliminated from the study. Finally, we had 191 documents for bibliometric analysis and SLR.

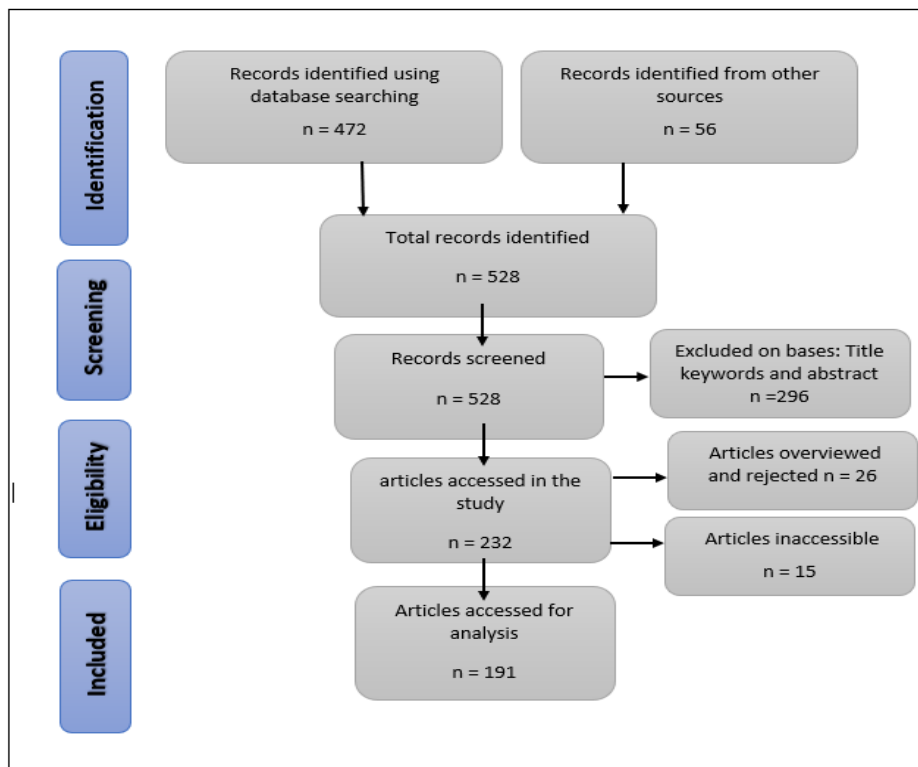


Figure 2: Inclusion exclusion criteria for retrieval of data for bibliometric analysis using PRISMA approach
Source: Authors' Own

Results and Discussion

Year-wise trend of publication

Figure 3 shows the article's yearly publication. A growing trend in the number of publications per year is evident here. The average annual growth is 15.06 per cent. The year 2021 had the maximum number of publications, i.e., 32 articles. The year 2022 has 29 publications which exceeded 2021 by the year end. Before 2014 number of publications was in single digit. The time between 2014-2016 was turning point in the field of well-being as the researchers extended their probe into "employee well-being with performance" also. The extension is attributed to employee well-being as a composite term for measuring financial, physical, emotional and mental well-being and further the growing importance of human capital in the corporate world. The highest growth trend was visible from 2019-2020, which may be due to the evoke of Covid-19, during which there were higher uncertainties related to life and work such as: financial, emotional, health and psychological issues.

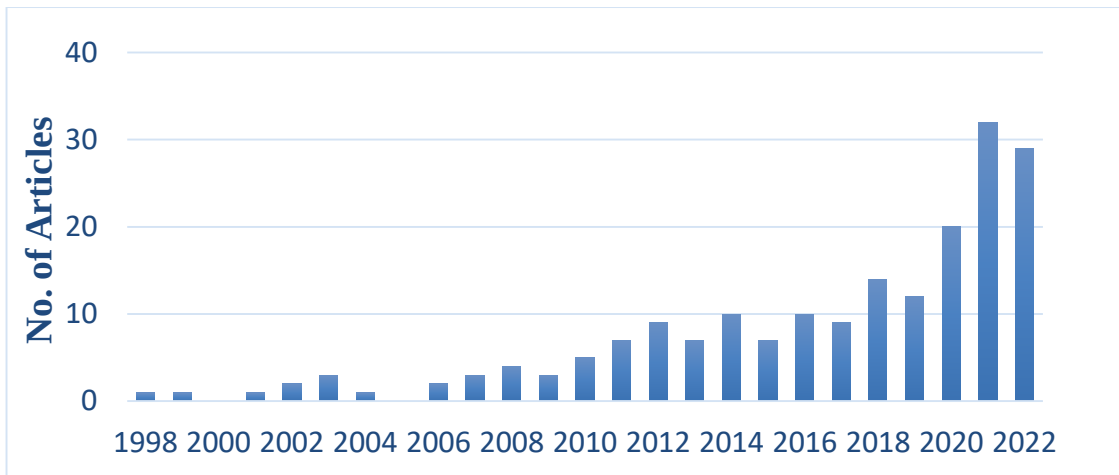


Figure 3: Annual scientific production and trend on 'employee well-being and performance'.

Note: above figure is based on our data search from SCOPUS on 15th November 2022.

Source: Authors' Own

Influential source analysis

Table 2 shows the top journals having more than 5 publications scores and contributing highly towards performance and employee well-being. International Journal of Human Resource Management is a highly contributory journal with 17 publications. John Wiley & Sons are the publishers of 4 journals out of 8, so we can say that John Wiley & Sons is the top contributing publisher. The impact factor of all top journals is excellent, two of which have an impact factor above 10, indicating the richness of selected article.

Table 2: Top influential journals, their impact and influence.

S.no.	Sources	Publisher	NP	JIF
1	International Journal of Human Resource Management	Routledge	17	7.8
2	Journal of Occupational Health Psychology	APA	13	12.4
3	Human Resource Management Journal	Wiley	12	7.7
4	Frontiers in Psychology	Frontiers	11	4.0
5	Journal of Organizational Behaviour	Wiley	6	11.6
6	Personnel Review	Emerald	6	4.6
7	Asia Pacific Journal of Human Resources	Wiley	5	5.8
8	Human Resource Management	Wiley	5	8.4

Note: This table lists the top journals with 5 or more publications (NP), their publishers, and journal impact factor (JIF) as per the Scopus database.

Influential authors analysis

Table 3 shows the top 10 authors who contributed most to our topic. Arnold Bakker was the most productive and efficient author, with the highest production and citations. Evangelia Demerouti wrote four documents and topped the average citations per document. There were five authors with four papers each. Five authors were from the Netherlands, ranked 4th in the most influential country's list for publication on employee well-being as per table 4. The countries from which the top-producing authors belong were also the countries with the highest co-authorship network, as per Figure 4. Sven Hauff, who secured the second position among top-producing authors, had scored the least citations due to all publications in the year 2022 and after that.

Table 3: Top influential authors, their impact and influence.

S.no.	Author Name	Affiliation	Country	NP	TC
1	Arnold Bakker	Erasmus University	Netherlands	8	7736
2	Timothy Bartram	La Trobe University	Australia	4	144
3	Peter Boxall	University Of Auckland	New Zealand	4	449
4	Wilmar Schaufeli	Utrecht University	Netherlands	4	537
5	Evangelia Demerouti	Eindhoven University	Netherlands	4	7332

6	Sven Hauff	Helmut Schmidt University	Germany	4	34
7	Kerstin Alfes	Kingston University	UK	3	323
8	Jaap Paauwe	Tilburg University	Netherlands	3	582
9	K. Van De Voorde	Tilburg University	Netherlands	3	532
10	James Avey	Central Washington University	United States	2	499

Note: This table lists the top 10 authors with a high number of publication (NP), their affiliations and Total citations as per the Scopus database.

Table 4: Top influential countries their impact, influence and collaborations.

S.no.	Country	NP	SCP	MCP	GC
1	United Kingdom	19	15	4	1846
2	USA	19	17	2	1869
3	Australia	18	16	2	1213

Table Contd...

S.no.	Country	NP	SCP	MCP	GC
4	Netherlands	14	10	4	8507
5	China	11	5	6	463
6	Spain	9	6	3	86
7	Germany	8	7	1	210
8	Canada	7	6	1	374
9	Finland	7	2	5	368
10	New Zealand	7	6	1	486

Note: This table lists the top 10 countries with a high number of publications (NP) and their single-country publications (SCP), multiple-country publications (MCP) and global citations (GC) as per the Scopus database.

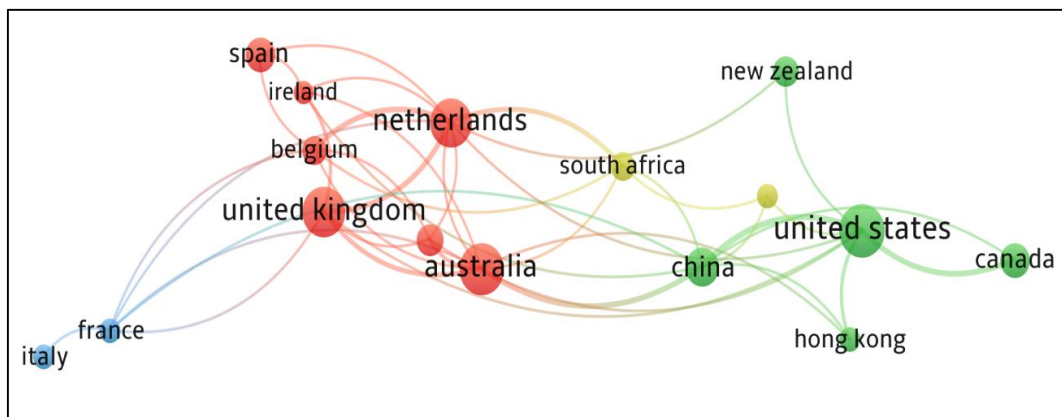


Figure 4: Co-authorship network of countries created using Vos viewer software.

Source: Authors' Analysis using Vos viewer software

Influential document analysis

Table 5 shows that 'The Job Demands-Resources model: State of the art', written by Arnold Bakker and Evangelia Demerouti, had the highest global citations because of its pioneer work toward employee well-being. JD-R Model proposed that an imbalance between job demands and job resources causes stress and burnout. The top 3 most cited documents relate to the job demand-resources model as imbalances between job demands and job resources lead to well-being issues. From the list of 10 most globally cited documents, 4 were the works of Arnold Bakker and Evangelia Demerouti. 5 authors whose documents secured positions in the top 10 most cited papers were also in the list (Table 3) of most influential authors in terms of production of documents. Most of the top cited papers were contributions of the Netherlands which also secured a place in Table 4 of most influential countries. Top cited documents cover various aspects of well-being like lack of resources, health, mindfulness, performance, happiness, work-life balance and control.

Table 5: Top influential articles, their authors and impact

S.no.	Paper	Document Name	GC
1	Bakker And Demerouti (2007)	The Job Demands-Resources model: State of the art	5134
2	Bakker And Demerouti (2017)	Job demands-resources theory: Taking stock and looking forward	1614
3	Demerouti And Bakker (2011)	The Job Demands–Resources model: Challenges for future research	584
4	Guest (2017)	Human resource management and employee well-being: Towards a new analytic framework	455
5	Thompson And Prottas (2006)	Relationships among organizational family support, job autonomy, perceived control, and employee well-being	452
6	Voorde And Paauwe (2012)	Employee well-being and the HRM–organizational performance relationship	448
7	Avey et. al. (2010)	Impact of positive psychological capital on employee well-being over time	448
8	Glomb et al (2011)	Mindfulness at work	417
9	Grant et al. (2007)	Happiness, health, or relationships? managerial practices and employee well-being Tradeoffs	375
10	Bakker (2010)	Beyond the Demand-Control model	340

Note: This table lists top 10 articles with the highest global citations (GC) their year of publication and their authors as per SCOPUS Database

Influence and Collaboration Analysis of Affiliations and Countries

Conducting affiliation analysis was to study the significant Universities and the regions from where our study has maximum contributions. Table 6 presented the Universities having a contribution of more than 5 publications. Tilburg University and Erasmus University are in the top two, both from the Netherlands, followed by two universities from Australia. We can synthesize from Table 6 that the Universities of the Netherlands had leading publications in this area. Table 4 presents the top 10 countries where the maximum number of articles were published. The United Kingdom and the USA were in the top two having 19 publications each, followed by Australia and Netherlands. The United Kingdom is the most producing region, but as per Table 6, Cranfield University of the United Kingdom was at the bottom of the top ten Universities list in terms of affiliation. The Universities in the United Kingdom need to work in collaboration with other Universities in the UK to facilitate knowledge sharing and resource pooling, ultimately bolstering the research output of Universities in the UK. Universities of the Netherlands are at the top in terms of articles. At the same time, the Netherlands is 4th in the top producing country list (table 4), which indicates a high collaboration among the universities of the Netherlands, as collaborated work counts for each collaborating university. Articles from the Netherlands had the highest global citations, followed by the USA and UK. Multiple country production (MCP), which indicated collaboration among countries, China was on top, having 6 multiple country production (table 4), followed by Finland. The UK and Netherlands had 4 MCP, but if we compare the ratio with total articles, the Netherlands is ahead of the UK. As per Figure 4, which shows the co-authorship network of countries, we found that authors from developed countries like the USA, UK, Netherlands, and Australia collaborated more with other country's authors. A developing country, China also collaborated highly with other countries in well-being research.

Table 6: Top influential affiliations their country and impact.

S.no.	Affiliation	Country	Articles
1	Tilburg University	Netherlands	14
2	Erasmus University Rotterdam	Netherlands	13
3	La Trobe University	Australia	12
4	Monash University	Australia	11
5	Helmut Schmidt University	Germany	8
6	Utrecht University	Netherlands	8
7	Ludwig Maximilian University	Germany	7
8	Portland State University	USA	7
9	Renmin University of China	China	7
10	Cranfield University	United Kingdom	6

Note: This table lists the top 10 Affiliations their country and numbers of articles as per the SCOPUS Database.

Content analysis of Literature

To get an insight into the intellectual structure of the research, we performed a content analysis of the last five years of literature (2018-2022). Through this, 3 clusters were identified based on the commonality of the theme followed by them. Further, a keyword analysis was done to get insight into the topic of well-being & performance. A detailed content analysis is presented by the researcher in the following paragraphs.

Cluster One: *High-Performance Work System (HPWS) and Performance Relation with wellbeing.*

Cluster one is the largest cluster that seeks the relationship of HPWS with employee well-being, with a motive of gradual increase in performance by adopting performance-related HR practices. Guest (2017) recognised the need to introduce employee well-being in HR practices and policies on ethical grounds and a positive impact on organizational outcomes. According to Page and Vella-Brodrick (2009), "Employee well-being is an important academic and practical pursuit due to its links to performance and turnover". Well-being-oriented HRM and engagement practices could fasten the relationship between well-being and performance (Kundi et al., 2020; Benitez & Medina, 2022), but it also depends upon a bundle of practices (Salas-Vallina et al., 2021) like spirituality (Djafri et al., 2018), mindfulness interventions (Pang & Ruch, 2018; Sharma & Kumra, 2020), employee voice promotion (Rollmann et al., 2021), meaningfulness and social worth at workplace (Duan et al., 2020) and supportive organizations (Sungu et al., 2019) strengthened the relationship of well-being and performance. Calderwood et al. (2021) found a positive relationship between physical well-being and performance. However, well-being dimensions are variedly associated with performance, such as psychological well-being having a relation with innovative job performance and physical well-being having a relation with in-role job performance. However social well-being boosts both (Khoreva & Wechtler, 2018). HPWS that seek a gradual increase in performance not only result in increased performance but also benefit the employees with higher well-being (Hauff et al., 2022b), but Guerci, Hauff and Gilardi, (2022) found that HPWS practices such as autonomy, performance-related pay, self-directed team do not have the same relationship with different dimensions of well-being (health, happiness and social well-being). HPWS positively correlated with well-being when mediated by employee engagement and job satisfaction (Hauff et al., 2022a; Ananthram et al., 2018). HPWS increases well-being through organizational support but could negatively impact employee well-being through increased stress (Qi et al., 2021). Work stress caused by HPWS leads to presentism, which could lower the employees' performance and well-being (Ananthram et al., 2018; Ho et al., 2022). HPWS strategies should be implemented cautiously, as negative emotions about strategic change may lead to insomnia and poor psychological well-being of employees (Rafferty & Jimmieson, 2017).

Cluster Two: *Leadership and HRM Practices that foster well-being for enhanced performance*

Cluster two is the second largest cluster that seeks empirical evidence of how leadership styles like ethical leadership, virtuous leadership, participative leadership and HRM practices like teamwork and participation in management can impact employee well-being and performance. These studies suggest practical implications for administrators while planning HR policies. Many studies stated that employees who perceived high organizational support were high on well-being and felt obliged to achieve high organizational performance (Hendriks et al., 2020; Cheng et al., 2022). Hetrick et al., (2022) stated that unethical leadership behaviour threatens employees and negatively impacts employee wellbeing in terms of high burnout and lower health condition. Studies support that supportive leadership styles like ethical (Sarwa et al., 2020; Cheng, 2022), transformational (Addo & Dartey-Baah, 2020) and virtuous leadership (Hendriks et al., 2020) directly or indirectly link employee well-being and results in higher performance and engagement. However, if the organizations have problems related to interpersonal conflicts (Losada-Otalora et al., 2020) and a flawed psychological environment (Brunetto et al., 2021) signifies a decline in employee well-being.

To cope with these problems, organizations can adopt the sustainable HRM principle of common good value that provides the possibility of high performance through higher job resources (Lu et al., 2022). Interpersonal conflicts are resolved through highly collaborative teamwork, which might have unintended consequences on well-being but a positive impact on employee collaboration and performance. In order to achieve a growing trend in performance, administrators may focus on enhancing employee well-being through promoting autonomy, facilitating participation in management (Uribetxebarria et al., 2021) and offering resilience training programs (Scheuch et al., 2021), as these initiatives have a positive impact on employee performance. Knight and Haslam (2010) also found that the autonomy of employees in designing a workspace is a predictor of psychological comfort at work, leading to enhanced employee well-being. While it is important to invest in HRM practices to promote employee well-being, Research also suggests that beyond a certain point, continued investment in HRM may actually lead to a decline in well-being (Ho & Kuvaas, 2019). This cluster had two more studies (Yao et al., 2021; Hauff et al., 2022b) that discussed the health dimension of well-being and found that health-oriented leadership positively impacts employee's physical well-being.

following future research avenues on well-being and performance:

- We found significant differences between the studies regarding the factors they have used for measuring employee well-being, so there is a need to develop an accurate and comprehensive measurement scale for measuring employee well-being rather than subjective measures.
- Only a few studies measured the direct relationship between employee well-being and performance. Well-being was frequently used as a mediator and moderator to study the impact of certain independent variables on performance. Future research can work toward measuring the direct impact of well-being on performance.
- Most empirical studies have collected data from a single point of time so, future studies can be longitudinal research to check the sustainability of well-being practices over a longer period.
- Employee well-being had its own financial cost and also contributed toward the revenues. Nevertheless, we have yet to find a study that measures the financial effectiveness of well-being. So future research can work toward empirically testing the financial feasibility of well-being in terms of performance as financial returns.
- From the analysis of cluster one, we learned that different leadership styles were individually tested to measure their concern toward well-being and its impact on performance. So, future research can examine the impact of different leadership styles on employee well-being to know the role of leadership in well-being-oriented HRM.

Conclusion

The objective of our study was to synthesize the literature in the area of well-being and performance. So, in line with our objective, we used bibliometric analysis and systematic literature review and found an average growth of more than 15 per cent in this research area. Factors contributing to the growth of literature on well-being were: the increasing importance of human capital and curiosity to know about how to maintain human capital.

We found the most impactful journals, authors, documents and affiliations in our study. International Journal of Human Resource Management and Journal of Occupational Health Psychology tops our list. Arnold Bakker and Timothy Bartram contributed maximum literature on well-being. Universities of the Netherlands collaborated more while the United Kingdom and the USA were highly producing.

Three clusters were identified through an in-depth literature analysis of recent studies. The theme of the first cluster is the relation of HPWS and performance with well-being; the second is leadership and HRM practices that foster well-being for enhanced performance and the last is the impact of WFC and WLB on well-being. These clusters will help the researchers to choose their area of interest for future studies. At last, we have identified future research avenues that will guide the researchers.

The studies selected for descriptive content analysis were limited to only five years (2018-2022). We used only one database, i.e., SCOPUS, to collect literature. Future research can work on these limitations.

References:

- Addo, S.A. and Dartey-Baah, K., (2020).** Leadership in the safety sense: where does perceived organisational support fit?. *Journal of Management Development*, 39(1), pp.50-67.
- Ali, J., Jusoh, A., Idris, N., Abbas, A., Nor, K.M. and Alharthi, R.H.E., (2021).** Thirty-Eight Years of 'Wellbeing' Research: Bibliometric Analysis of Open Access Documents. *Studies of Applied Economics*, 39(10).
- Anand, A. and Vohra, V., (2022).** What helps me cope with work–family conflict at my high-performance work system in India: A thematic analysis of sociocultural factors. *Vikalpa*, 47(1), pp.38-52.
- Ananthram, S., Xerri, M.J., Teo, S.T. and Connell, J., (2018).** High-performance work systems and employee outcomes in Indian call centres: a mediation approach. *Personnel Review*, 47(4), pp.931-950.
- Aria, M. and Cuccurullo, C., (2017).** bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of informetrics*, 11(4), pp.959-975.
- Beer, M., (1984).** Managing human assets. Free Press.
- Bellet, C., De Neve, J.E. and Ward, G., (2019).** Does Employee Happiness Have an Impact on Productivity? *id Business School WP* 2019-13.
- Benitez, M. and Medina, F.J., (2022).** A work-unit level analysis of employees' well-being and service performance in hospitality industry. *Current Psychology*, 41(2), pp.1043-1056.
- Brunetto, Y., Saheli, N., Dick, T. and Nelson, S., (2022).** Psychosocial safety climate, psychological capital, healthcare SLBs' wellbeing and innovative behaviour during the COVID 19 pandemic. *Public Performance & Management Review*, 45(4), pp.751-772.
- Calderwood, C., ten Brummelhuis, L.L., Patel, A.S., Watkins, T., Gabriel, A.S. and Rosen, C.C., (2021).** Employee physical activity: A multidisciplinary integrative review. *Journal of Management*, 47(1), pp.144-170.
- Cheng, J., Zhang, L., Lin, Y., Guo, H. and Zhang, S., (2022).** Enhancing employee wellbeing by ethical leadership in the construction industry: The role of perceived organizational support. *Frontiers in public health*, 10, p.935557.
- Danna, K. and Griffin, R.W., (1999).** Health and well-being in the workplace: A review and synthesis of the literature. *Journal of management*, 25(3), pp.357-384.
- Djafri, F., Bin Noordin, K. and Naail Mohammed, K.A.M.I.L., (2018).** The measurement model of performance determinants: A case study of Islamic insurance (takaful) in Malaysia. *International Journal of Ethics and Systems*, 34(2), pp.166-185.
- Donthu, N., Kumar, S., Mukherjee, D., Pandey, N. and Lim, W.M., (2021).** How to conduct a bibliometric analysis: An overview and guidelines. *Journal of business research*, 133, pp.285-296.
- Duan, J., Wang, X., Brinsfield, C.T. and Liu, S., (2020).** How enhancing employee well-being can encourage voice behavior: A desire fulfillment perspective. *Human Performance*, 33(5), pp.425-446.
- Grant, A.M., Christianson, M.K. and Price, R.H., (2007).** Happiness, health, or relationships? Managerial practices and employee well-being tradeoffs. *Academy of management perspectives*, 21(3), pp.51-63.
- Guerci, M., Hauff, S. and Gilardi, S., (2022).** High performance work practices and their associations with health, happiness and relational well-being: are there any tradeoffs?. *The International Journal of Human Resource Management*, 33(2), pp.329-359.
- Guest, D.E., (2017).** Human resource management and employee well-being: Towards a new analytic framework. *Human resource management journal*, 27(1), pp.22-38.
- Hamar, B., Coberley, C., Pope, J.E. and Rula, E.Y., (2015).** Well-being improvement in a midsize employer: Changes in well-being, productivity, health risk, and perceived employer support after implementation of a well-being improvement strategy. *Journal of occupational and environmental medicine*, 57(4), pp.367-373.
- Hamilton Skurak, H., Malinen, S., Näswall, K. and Kuntz, J.C., (2021).** Employee wellbeing: The role of psychological detachment on the relationship between engagement and work–life conflict. *Economic and Industrial Democracy*, 42(1), pp.116-141.

- Hauff, S., Felfe, J. and Klug, K., (2022).** High-performance work practices, employee well-being, and supportive leadership: spillover mechanisms and boundary conditions between HRM and leadership behavior. *The International Journal of Human Resource Management*, 33(10), pp.2109-2137.
- Hauff, S., Krick, A., Klebe, L. and Felfe, J., (2022).** High-performance work practices and employee wellbeing—does health-oriented leadership make a difference?. *Frontiers in psychology*, 13, p.833028.
- Hendriks, M., Burger, M., Rijsenbilt, A., Pleeging, E. and Commandeur, H., (2020).** Virtuous leadership: a source of employee well-being and trust. *Management Research Review*, 43(8), pp.951-970.
- Hetrick, A.L., Mitchell, M.S., Villarosa-Hurlocker, M.C. and Sullivan, T.S., (2022).** The consequence of unethical leader behavior to employee well-being: Does support from the organization mitigate or exacerbate the stress experience?. *Human Performance*, 35(5), pp.323-344.
- Ho, H. and Kuvaas, B., (2020.)** Human resource management systems, employee well-being, and firm performance from the mutual gains and critical perspectives: The well-being paradox. *Human Resource Management*, 59(3), pp.235-253.
- Ho, T.C., Teo, P.C., Rizal, A.M., Kelana, B.W.Y. and Othman, R., (2022).** Well-Being In The Workplace: Unravelling The Determinants And Consequences Of Work Stress Presenteeism From The Perspective Of The Job Demands-Resources (Jd-R) Model. *Journal of Southwest Jiaotong University*, 57(3).
- Jiang, K., Lepak, D.P., Hu, J. and Baer, J.C., (2012).** How does human resource management influence organizational outcomes? A meta-analytic investigation of mediating mechanisms. *Academy of management Journal*, 55(6), pp.1264-1294.
- Khoreva, V. and Wechtler, H., (2018).** HR practices and employee performance: the mediating role of well-being. *Employee Relations*, 40(2), pp.227-243.
- Knight, C. and Haslam, S.A., (2010).** Your place or mine? Organizational identification and comfort as mediators of relationships between the managerial control of workspace and employees' satisfaction and well-being. *British Journal of Management*, 21(3), pp.717-735.
- Kundi, Y.M., Aboramadan, M., Elhamalawi, E.M. and Shahid, S., (2020).** Employee psychological well-being and job performance: exploring mediating and moderating mechanisms. *International Journal of Organizational Analysis*, 29(3), pp.736-754.
- Losada-Otalora, M., Peña-García, N. and Sánchez, I.D., (2020).** Interpersonal conflict at work and knowledge hiding in service organizations: the mediator role of employee well-being. *International Journal of Quality and Service Sciences*, 13(1), pp.63-90.
- Lu, Y., Zhang, M.M., Yang, M.M. and Wang, Y., (2023).** Sustainable human resource management practices, employee resilience, and employee outcomes: Toward common good values. *Human Resource Management*, 62(3), pp.331-353.
- Medina-Garrido, J.A., Biedma-Ferrer, J.M. and Ramos-Rodríguez, A.R., (2021).** Moderating effects of gender and family responsibilities on the relations between work–family policies and job performance. *The International Journal of Human Resource Management*, 32(5), pp.1006-1037.
- Nielsen, K., Nielsen, M.B., Ogbonnaya, C., Käsälä, M., Saari, E. and Isaksson, K., (2017).** Workplace resources to improve both employee well-being and performance: A systematic review and meta-analysis. *Work & stress*, 31(2), pp.101-120.
- Oakman, J., Kinsman, N., Stuckey, R., Graham, M. and Weale, V., (2020).** A rapid review of mental and physical health effects of working at home: how do we optimise health?. *BMC public health*, 20, pp.1-13.
- Ogbonnaya, C., (2019).** Exploring possible trade-offs between organisational performance and employee well-being: The role of teamwork practices. *Human Resource Management Journal*, 29(3), pp.451-468.
- Intelligence, O.W., (2020).** As uncertainty remains, anxiety and stress reach a tipping point at work. Oracle. com.
- Ortiz-Bonnin, S., Blahopoulou, J., García-Buades, M.E. and Montañez-Juan, M., (2023).** Work-life balance satisfaction in crisis times: from luxury to necessity—The role of organization's responses during COVID-19 lockdown. *Personnel Review*, 52(4), pp.1033-1050.
- Page, K.M. and Vella-Brodrick, D.A., (2009).** The ‘what’, ‘why’ and ‘how’ of employee well-being: A new model. *Social indicators research*, 90, pp.441-458.

- Pang, D. and Ruch, W., (2019).** Fusing character strengths and mindfulness interventions: Benefits for job satisfaction and performance. *Journal of occupational health psychology*, 24(1), p.150.
- Qi, W., Enhua, H., Jiandong, S. and Hongmei, S., (2021).** Double-edged sword effect of high-performance work system on employee well-being—moderating effect of union practice. *Frontiers in Psychology*, 12, p.619345.
- Rafferty, A.E. and Jimmieson, N.L., (2017).** Subjective perceptions of organizational change and employee resistance to change: Direct and mediated relationships with employee well-being. *British Journal of Management*, 28(2), pp.248-264.
- Röllmann, L.F., Weiss, M. and Zacher, H., (2021).** Does voice benefit or harm occupational well-being? The role of job insecurity. *British Journal of Management*, 32(3), pp.708-724.
- Rusdi, Z.M. and Wibowo, A., (2022),** March. Mindfulness and Well-Being: A Bibliometric Analysis. In 7th Sriwijaya Economics, Accounting, and Business Conference (SEABC 2021) (pp. 141-146). Atlantis Press.
- Salas-Vallina, A., Alegre, J. and López-Cabrales, Á., (2021).** The challenge of increasing employees' well-being and performance: How human resource management practices and engaging leadership work together toward reaching this goal. *Human Resource Management*, 60(3), pp.333-347.
- Sarwar, H., Ishaq, M.I., Amin, A. and Ahmed, R., (2020).** Ethical leadership, work engagement, employees' well-being, and performance: a cross-cultural comparison. *Journal of Sustainable Tourism*, 28(12), pp.2008-2026.
- Scheuch, I., Peters, N., Lohner, M.S., Muss, C., Aprea, C. and Fürstenau, B., (2021).** Resilience training programs in organizational contexts: A scoping review. *Frontiers in Psychology*, 12, p.733036.
- Sharma, P.K. and Kumra, R., (2022).** Examining the mediating role of work engagement on the relationship between workplace mindfulness and organizational justice and its association with well-being. *South Asian Journal of Business Studies*, 11(2), pp.129-148.
- Singh, D. and Malik, G., (2022).** A systematic and bibliometric review of the financial well-being: advancements in the current status and future research agenda. *International Journal of Bank Marketing*, 40(7), pp.1575-1609.
- Stankevičienė, A., Tamaševičius, V., Diskienė, D., Grakauskas, Ž. and Rudinskaja, L., (2021).** The mediating effect of work-life balance on the relationship between work culture and employee well-being. *Journal of Business Economics and Management*, 22(4), pp.988-1007.
- Stoll, L., (2014).** A short history of wellbeing research. *Wellbeing: A complete reference guide*, pp.1-19.
- Sungu, L.J., Weng, Q. and Kitule, J.A., (2019).** When organizational support yields both performance and satisfaction: The role of performance ability in the lens of social exchange theory. *Personnel Review*, 48(6), pp.1410-1428.
- Uribetxebarria, U., Garmendia, A. and Elorza, U., (2021).** Does employee participation matter? An empirical study on the effects of participation on well-being and organizational performance. *Central European Journal of Operations Research*, 29(4), pp.1397-1425.
- Van De Voorde, K., Paauwe, J. and Van Veldhoven, M., (2012).** Employee well-being and the HRM–organizational performance relationship: a review of quantitative studies. *International Journal of Management Reviews*, 14(4), pp.391-407.
- Wang, H., Zhang, Y. and Wan, M., (2022).** Linking high-performance work systems and employee well-being: A multilevel examination of the roles of organisation-based self-esteem and departmental formalisation. *Human Resource Management Journal*, 32(1), pp.92-116.
- Warr, P. and Nielsen, K., (2018).** Wellbeing and work performance. *Handbook of well-being*, pp.1-22.
- Wright, T.A. and Huang, C.C., (2012).** The many benefits of employee well-being in organizational research. *Journal of Organizational Behavior*, 33(8), pp.1188-1192.
- Yao, L., Li, P. and Wildy, H., (2021).** Health-promoting leadership: concept, measurement, and research framework. *Frontiers in psychology*, 12, p.602333.
- Yunita, P.I. and Saputra, I.G.N.W.H., (2019).** Millennial generation in accepting mutations: Impact on work stress and employee performance. *International journal of social sciences and humanities*, 3(1), pp.102-114.

SOUTH ASIAN JOURNAL OF MANAGEMENT RESEARCH (SAJMR)

Dear Researcher,

We are pleased to announce the opportunity to submit your research paper for UGC Care Listed potential publication in the South Asian Journal of Management Research (SAJMR), an open-access, double blind referred peer-reviewed international journal published since 2009. SAJMR, published by CSIBER Press, Kolhapur, India, is committed to disseminating quality research articles, reviews, and perspectives that explore the business, technology, social work, and environmental sustainability in the contemporary era.

CSIBER www.siberindia.edu.in is a Higher Education Autonomous Institute known for its excellence in imparting teaching and research in Commerce, Management, Computer Studies, Environment, Social Work, and Economics. It holds the prestigious College with Potential for Excellence (CPE) status granted by the UGC, Government of India and has been re-accredited with an A+ Grade by the National Assessment and Accreditation Council (NAAC) in its 4th cycle, Government of India.

Aim and Scope

SAJMR encompasses a multidisciplinary approach, covering crucial domains such as Commerce and Management, Computer Studies, Environment Management, and Social Work. It is a biannual journal published in January and July. The journal follows a double blind peer-review process, ensuring the maintenance of high standards and the fair evaluation of submissions. We publish special issues of the journal too.

Frequency

Half yearly and special issues.

URL

To access the current issue and archives or to learn more about the journal guidelines, please visit:

<https://sites.google.com/siberindia.edu.in/sajmr/>

Paper Submission

To submit your manuscript, please adhere to the journal's guidelines and submit your paper via email to editorsajmr@siberindia.edu.in Once the papers accepted for publication, authors are required to submit the copyright of the paper to the publisher.

Paper Format

- Abstract
- Introduction
- Research Methodology
- Results and Discussions
- Conclusion
- References (Harvard, APA, Referencing Style)

We look forward to receiving your valuable contributions to the South Asian Journal of Management Research (SAJMR) and providing a platform for the dissemination of your research. Thank you for considering this invitation, and we appreciate your commitment to advancing knowledge in your field.

Best regards,

Dr. Pooja M. Patil

Editor,

South Asian Journal of Management Research (SAJMR), ISSN : ISSN-0974-763X

Chhatrapati Shahu Institute of Business Education & Research (CSIBER)

University Road, Kolhapur— 416004, Maharashtra, India

E-mail : editorsajmr@siberindia.edu.in

Website : www.siberindia.edu.in

Chhatrapati Shahu Institute of Business Education & Research (CSIBER)

(An Autonomous Institute)

University Road, Kolhapur - 416004, Maharashtra State, India.

website : www.siberindia.edu.in

E-mail : editorsajmr@siberindia.edu.in



UGC-CARE Listed Journal

ISSN 0974- 763X

Volume 14, No. 4

November, 2024