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An Empirical Study on the Effectiveness of Digital Marketing Channels on B2b Purchase Intentions in HR Consulting.

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Abstract

This research paper investigates the effect of digital marketing strategies on customer purchase intention within the context of HR consultancy, a leading B2B service provider. Through descriptive and statistical analysis, the study examines various channels influencing purchase intention, including email marketing, social media marketing, and Electronic Word of Mouth (EWOM). Descriptive findings reveal insights into respondent demographics, educational qualifications, association tenure, sector affiliation, company size, and services availed. Statistical analysis elucidates significant relationships between digital marketing channels and purchase intention, highlighting the importance of tailored strategies for different industry sectors. Suggestions derived from the findings include refining email marketing strategies, enhancing social media engagement, leveraging positive EWOM, and implementing sector-specific marketing approaches. The study concludes by emphasizing the importance of dynamic and adaptive marketing strategies to influence customer purchase intentions effectively.

Keywords: Customer purchase intention, social media marketing, electronic word of mouth, Email marketing.

Introduction

In the rapidly evolving business landscape, digital marketing has become an indispensable tool for organizations, including HR consultancy firms, to influence customer purchase intentions. Digital marketing encompasses a wide range of strategies and techniques that leverage online platforms to engage and communicate with potential customers. With the rise of the internet and social media, traditional marketing methods are no longer sufficient to meet the needs of businesses, making it essential for HR consultancy firms to explore and utilize effective digital marketing strategies (Chaffey, 2019). This study aims to explore the role of digital marketing in shaping customer purchase intention, particularly within the context of HR consultancy services.

In today's competitive market, customer purchase intention plays a critical role in driving sales and business growth (Kotler et al., 2017). Understanding what influences these intentions is crucial for HR consultancy firms looking to attract and retain clients. Digital marketing techniques, such as social media marketing, email marketing, and electronic word of mouth (eWOM), have shown to be effective tools in impacting customer decision-making (Solomon, 2020). Social media platforms provide opportunities for real-time engagement, brand awareness, and trust-building with potential clients, while email marketing offers personalized communication, fostering stronger relationships (Baker et al., 2020). Furthermore, eWOM, through online reviews and customer testimonials, serves as a powerful influence on purchase decisions, as potential clients often trust peer recommendations over traditional advertising (Cheung et al., 2008).

The primary objective of this study is to understand the effect of digital marketing on customer purchase intention with reference to HR consultancy. This research seeks to determine which digital marketing strategies most effectively influence clients' decisions to purchase HR consultancy services. By focusing on social media marketing, email marketing, and eWOM, the study will identify the most impactful digital marketing methods and their specific role in shaping customer behavior (Kotler et al., 2017).

The secondary objectives of the study are as follows: first, to analyze the current email marketing techniques employed by HR consultancy firms and assess their impact on customer purchase intention. Email marketing remains one of the most direct and personalized forms of digital communication, and understanding its effectiveness in influencing purchase decisions is a key area of interest (Baker et al., 2020). Second, the study will examine the role of social media marketing efforts and eWOM in influencing customer purchase intentions. Social media marketing has grown significantly, providing HR consultancy firms with a platform to directly engage with potential clients, while eWOM builds credibility and trust, further influencing consumer decisions (Cheung et al., 2008). Lastly, the study aims to provide recommendations on the most effective digital marketing strategies that HR consultancy firms can implement to enhance customer purchase intention.

The scope of this study is to focus on the most impactful digital marketing techniques—social media marketing, email marketing, and eWOM—that influence customer purchase intentions. It will provide HR consultancy firms with insights into selecting the most effective strategies to improve customer acquisition and retention (Chaffey, 2019). The research will also examine the digital marketing processes employed by HR consultancies, offering

an overview of how these organizations utilize various platforms to promote their services and engage with clients. This will allow the study to provide practical, evidence-based recommendations on how to improve digital marketing efforts within the HR consultancy industry.

By delving into these areas, this research will contribute to the understanding of how digital marketing strategies influence customer behavior and help HR consultancy firms improve their marketing strategies. The study aims to offer actionable insights that HR consultancy firms can use to refine their digital marketing techniques and, ultimately, increase their customer purchase intention and business success (Solomon, 2020).

Conceptual Framework

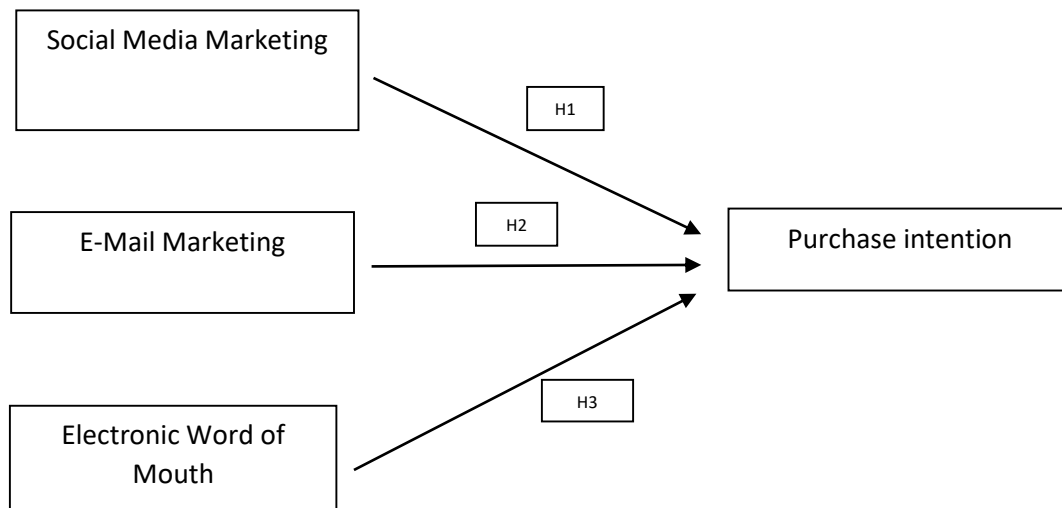


Figure 1.1 - Conceptual Framework

Literature Review and Hypothesis Development

Social Media Marketing and Purchase Intention

The pivotal role of social media marketing (SMM) in shaping consumer purchase intentions through various interconnected factors. Social media, defined as electronic communication platforms enabling online communities for sharing content and ideas (Merriam-Webster, 2012), serves as a dynamic tool for brands to engage consumers and influence their buying behavior. Research highlights that antecedents of social media marketing, such as consumer engagement, interactivity, and informativeness, significantly impact brand loyalty and, in turn, purchase intention (Almohaimmeed, 2019; Balakrishnan, 2014). Platform-specific studies, such as Aji et al. (2020) on Instagram in Indonesia's ready-to-drink tea market, illustrate the importance of visual content in driving purchase decisions. Similarly, Erlangga (2021) emphasized the ability of SMEs to leverage SMM for enhancing brand visibility and engagement, while Husnain et al. (2017) identified consumer engagement as a mediator linking SMM activities to purchase intention. Emotional and psychological connections fostered through luxury brand strategies (Kim & Ko, 2012) and performance-focused factors like hedonic provocation and customization (Alalwan, 2018; Godey et al., 2016) further enhance the effectiveness of SMM. Studies by Hutter and Hautz (2013) demonstrated the interactive impact of Facebook engagement on brand awareness, word-of-mouth, and purchase intention, reinforcing the value of tailored SMM strategies. Collectively, these findings suggest that successful social media marketing requires a strategic focus on consumer engagement, content quality, and platform-specific dynamics to drive purchase intentions and foster brand loyalty across diverse markets.

H1: Social media marketing has a significant positive effect on purchase intention.

Electronic- Word Of Mouth and Purchase Intention

The critical influence of Electronic Word of Mouth (eWOM) on purchase intention, highlighting its role as a powerful marketing tool in the digital age. Thureau et al. (2004) defined eWOM as online consumer statements—positive or negative—accessible to a broad audience. eWOM disseminates opinions, recommendations, and experiences through social media and online platforms, significantly impacting purchase decisions (Choi Meng Leong, 2022). Positive eWOM fosters trust, credibility, and social proof, encouraging favorable consumer responses, while its effectiveness depends on factors like source credibility, content relevance, user engagement,

and message virality (Choi Meng Leong, 2022). Online reviews and ratings, pivotal components of eWOM, have been found to directly influence purchase intention, with higher ratings and positive reviews boosting consumer trust (Sulthana & Vasanth, 2019).

Meta-analytic research by Ismagilova et al. (2020) identified key predictors of purchase intention, such as argument quality, valence, and eWOM usefulness, while highlighting less influential factors like message volume. This analysis offered both academic insights for future research and practical guidance for marketers. Verma and Yadav (2021) provided a comprehensive historical and forward-looking perspective on eWOM, examining its evolution and projecting its trajectory in marketing strategies. Studies like those by Erkan (2016) and Kala (2018) further explored eWOM's growing importance in reducing perceived risk, enhancing brand credibility, and influencing purchase decisions. Erkan emphasized the role of social ties and product involvement, while Kala demonstrated eWOM's impact on brand image in the lifestyle products sector, showcasing its dual potential to enhance or harm brand perceptions.

Jalilvand and Samiei (2012) corroborated these findings in the Iranian automobile industry, identifying a positive correlation between eWOM, brand image, and purchase intention, underlining the strategic importance of fostering positive eWOM interactions. Tariq et al. (2017) and Sa'ait et al. (2016) highlighted the mediating role of brand image in the eWOM-purchase intention relationship and the significance of eWOM attributes such as relevance, accuracy, timeliness, and comprehensiveness. Collectively, these studies underscore the necessity for businesses to actively manage and leverage eWOM to build trust, enhance brand image, and drive consumer purchase intentions, particularly in the context of growing e-commerce and social media integration.

H3: Electronic Word of mouth has a significant positive effect on purchase intention.

E-Mail Marketing and Purchase Intention

The literature highlights the critical role of email marketing in influencing customer purchase intentions, emphasizing its value as a direct and personalized communication tool. E-mail marketing as a direct marketing strategy aimed at fostering customer engagement, enhancing brand awareness, and promoting products or services. Nawas and Kaldeen (2020) demonstrated that the "offer" component in email marketing, such as clear product value explanations and attractive promotions, significantly enhances customer engagement, which in turn drives purchase intentions. Similarly, Bismo et al. (2019) confirmed that effective email campaigns, along with social media efforts, positively correlate with customer engagement, leading to increased conversion rates and business success. The personalization and relevance of email content were identified as key factors in fostering deeper customer connections (Bismo et al., 2019; Ali et al., 2015). Reimers et al. (2016) highlighted the impact of permission-based email marketing (PEM) in reducing perceived risks associated with online shopping while increasing perceived usefulness and enjoyment, aligning with the Technology Acceptance Model (TAM). Chittenden and Rettie (2003) further emphasized the importance of content relevance, timing, personalization, and strong calls-to-action in enhancing email campaign response rates. Ali et al. (2015) reinforced these findings by demonstrating how well-crafted email marketing campaigns improve brand perceptions, trust, and loyalty when they are consistent, visually appealing, and ethically executed.

While the benefits of email marketing are substantial, challenges such as information overload and privacy concerns remain. Ali et al. (2015) stressed the importance of balancing email frequency with content relevance to avoid overwhelming recipients and ensuring compliance with data protection laws to build trust. Collectively, these studies suggest that businesses leveraging tailored, engaging, and ethically executed email marketing strategies can enhance customer engagement, strengthen brand loyalty, and drive purchase intentions effectively.

H2: E-mail marketing has a significant positive effect on purchase intention.

Research Methodology

The research methodology used in this study is descriptive research, which aims to describe the current state of affairs without manipulating any variables. This approach focuses on depicting the characteristics of the individuals or groups being studied. Data was collected through a well-structured questionnaire, which was administered to customers, allowing for an accurate portrayal of their profiles and characteristics. Descriptive research serves to provide a clear understanding of the phenomenon under investigation and is useful in generating an overview of the subject matter based on the collected data. SPSS software was used in analysing the collected data.

Sampling

The sampling method used in this study is **convenience sampling**, a non-probability sampling technique where participants are selected based on their availability and accessibility to the researcher. This method involves selecting individuals who are conveniently located and willing to participate, rather than choosing a random sample from the population. In this study, the sample consists of **107 B2B customers** from an HR consultancy firm, who were surveyed due to their proximity and availability during the data collection process. This approach allows for quick and practical data collection but may limit the generalizability of the findings.

Data Collection

Primary data in this study was collected through a survey method using a structured questionnaire. The questionnaire was designed to capture specific information relevant to the research objectives. To ensure the accuracy and reliability of the responses, a Likert scale was used to measure the attitudes, opinions, and perceptions of the respondents. The Likert scale provided a range of responses (such as strongly agree, agree, neutral, disagree, and strongly disagree), allowing for a detailed analysis of the data collected from the participants. This approach enabled the researcher to gather quantitative data that could be analyzed systematically.

Questionnaire

The questionnaire for this research begins with a section on demographic information, followed by items addressing the key variables. The email marketing variable items were adopted from Bismo et al. (2019), while the social media marketing variable items were adapted from Husnain et al. (2017). Additionally, the electronic word-of-mouth (eWOM) variable items were sourced from Choi Meng Leong (2022). These sources provided validated scales to ensure the reliability and relevance of the questionnaire items in capturing the essence of the research problem.

Data Analysis

Reliability Analysis

The reliability analysis for the constructs indicates strong internal consistency, as evidenced by Cronbach's Alpha coefficients exceeding the threshold of 0.7 for all variables. Specifically, the Social Media Marketing construct, comprising 5 items, achieved a Cronbach's Alpha of 0.897, while the Email Marketing construct, also with 5 items, recorded a value of 0.779. Similarly, the eWOM construct with 5 items showed a coefficient of 0.837, and the Purchase Intention construct, containing 5 items, yielded a value of 0.752. These results confirm that the questionnaire items reliably measure their respective constructs.

Table -1 Reliability Test

Construct	No. Of. Items	Cronbach Alpha
Social Media Marketing	5	0.897
Email Marketing	5	0.779
EWOM	5	0.837
Purchase Intention	5	0.752

DESCRIPTIVE FINDING

The demographic analysis of the respondents revealed several key insights. Regarding age distribution, 43% of the respondents fall between the ages of 18–30 years, 23.4% are aged 31–40 years, 19.6% are aged 41–50 years, and 14% are above 50 years. In terms of gender, 61.1% of the respondents are male, while 38.9% are female. The educational qualifications of respondents indicate that 9.3% hold a diploma or equivalent degree, 31.5% possess a bachelor's degree, 25.9% have a master's degree, and 33.3% hold a professional degree. Regarding the years of association with HR consultancy, 29.6% of the respondents have been associated for one year, 9.3% for two years, 20.4% for three years, and 39.8% for four or more years.

The sector analysis shows that 60.2% of respondents are from the IT sector, while 39.8% are from the non-IT sector. Regarding employee size, 30.6% of the respondent companies have 1–10 employees, 50.9% have 1–30 employees, 13% have 1–50 employees, and 5.4% have more than 50 employees. Lastly, the services availed by respondents include payroll management (28.7%), contract staffing (20.4%), recruitment (20.3%), and permanent staffing (30.6%).

Table 1.2 – descriptive findings

Demographic Aspect	Category	Frequency	Percentage (%)
Age Group	18–30 years	46	43
	31–40 years	25	23.4
	41–50 years	21	19.6
	51 years and above	15	14
Gender	Male	66	61.1
	Female	41	38.9
Qualification	Diploma or equivalent degree	10	9.3
	Bachelor's degree	34	31.5
	Master's degree	28	25.9
	Professional degree	35	33.3
Years of Association	1 year	32	29.6
	2 years	10	9.3
	3 years	22	20.4
	4 and above years	43	39.8
Sector	IT sector	65	60.2
	Non-IT sector	42	39.8
Employee Size	1–10 employees	33	30.6
	1–30 employees	55	50.9
	1–50 employees	14	13
	More than 50 employees	5	5.4
Services Availed	Payroll management	31	28.7
	Contract staffing	22	20.4
	Recruitment	21	20.3
	Permanent staffing	33	30.6

Statistical Analysis and Discussions

Chi Square Test

Chi-Square Test: Sector and Service Availed

A chi-square test of independence was conducted to examine the relationship between the sector of the customer company and the service availed by the customers. The test revealed a statistically significant association between these variables, $\chi^2 (3, N = 107) = 83.934, p = .000$. This indicates that the type of service availed is influenced by the sector of the customer company. The results suggest that IT sector companies predominantly avail themselves of permanent staffing services, whereas non-IT sector companies are more likely to opt for payroll management and contract staffing.

Table 1.3 - Chi Square Test

Sector you belong to * Service availed Crosstabulation
Count

		service availed				Total
		Payroll management	Contract staffing	Recruitment	Permanent staffing	
Sector you belong to	IT sector	0	11	21	33	65
	non-IT sector	31	11	0	0	42
Total		31	22	21	33	107

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	83.934 ^a	3	.000
Likelihood Ratio	112.852	3	.000
Linear-by-Linear Association	75.389	1	.000
N of Valid Cases	107		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.24.

Correlation Analysis

A Pearson correlation coefficient was computed to assess the linear relationship between the variables: social media marketing, email marketing, eWOM, and purchase intention. The results indicated significant positive correlations between all the variables. Social media marketing showed a strong positive correlation with email marketing ($r = .698$, $p < .01$), eWOM ($r = .770$, $p < .01$), and purchase intention ($r = .655$, $p < .01$). Similarly, email marketing exhibited positive correlations with social media marketing ($r = .698$, $p < .01$), eWOM ($r = .523$, $p < .01$), and purchase intention ($r = .670$, $p < .01$). eWOM demonstrated a strong positive correlation with social media marketing ($r = .770$, $p < .01$), email marketing ($r = .523$, $p < .01$), and purchase intention ($r = .901$, $p < .01$). Finally, purchase intention showed significant positive correlations with social media marketing ($r = .655$, $p < .01$), email marketing ($r = .670$, $p < .01$), and eWOM ($r = .901$, $p < .01$). These results suggest a significant association between all the variables, supporting the alternative hypothesis that a strong linear relationship exists among social media marketing, email marketing, eWOM, and purchase intention.

Table 1.4 Descriptive Statistics

	Mean	Std. Deviation	N
social media marketing	17.50	5.41	107.00
Email marketing	18.23	4.03	107.00
ewom	18.65	3.99	107.00
pi	16.92	3.02	107.00

Correlations

		Social media marketing	Email marketing	ewom	pi
Social media marketing	Pearson Correlation	1	.698**	.770**	.655**
	Sig. (2-tailed)	0	0	0	0
	N	107	107	107	107
Email marketing	Pearson Correlation	.698**	1	.523**	.670**
	Sig. (2-tailed)	0	0	0	0
	N	107	107	107	107
E-WOM	Pearson Correlation	.770**	.523**	1	.901**
	Sig. (2-tailed)	0	0	0	0
	N	107	107	107	107
pi	Pearson Correlation	.655**	.670**	.901**	1
	Sig. (2-tailed)	0	0	0	0
	N	107	107	107	107

** . Correlation is significant at the 0.01 level (2-tailed).

Regression Analysis

Table 1.5

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	0.96	0.5		1.9	0.1					
	-0.2	0	-0.4	-7.9	0	0.7	-1	-0.2	0.3	3.5
	0.33	0	0.4	11.2	0	0.7	0.7	0.3	0.5	2
	0.75	0	1	22.3	0	0.9	0.9	0.6	0.4	2.5

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	885.913	3	295.304	378.644	.000 ^b
Residual	80.33	103	0.78		
Total	966.243	106			

a. Dependent Variable: purchase intention

b. Predictors: (Constant), ewom, emailmarketing, socialmediamarketing

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
1	0.96	0.5		1.9	0.1					
	-0.2	0	-0.4	-7.9	0	0.7	-1	-0.2	0.3	3.5
	0.33	0	0.4	11.2	0	0.7	0.7	0.3	0.5	2
	0.75	0	1	22.3	0	0.9	0.9	0.6	0.4	2.5

The multiple linear regression analysis was conducted to examine the impact of social media marketing, email marketing, and electronic word-of-mouth (eWOM) on purchase intention. The null hypothesis (H0) posited that there is no significant relationship between these variables, while the alternative hypothesis (H1) suggested a significant relationship. The model summary revealed an R value of 0.850, an R-squared value of 0.723, and an adjusted R-squared value of 0.712, indicating that the independent variables collectively explain 72.3% of the variance in purchase intention. The ANOVA results confirmed the overall model's significance ($F(3, 103) = 378.6$, $p < .001$). Upon examining the coefficients, social media marketing was found to have a significant negative relationship with purchase intention ($\beta = -0.417$, $t = -7.871$, $p < .001$). This suggests that an increase in social media marketing is associated with a decrease in purchase intention. In contrast, email marketing exhibited a significant positive relationship with purchase intention ($\beta = 0.443$, $t = 11.17$, $p < .001$), indicating that higher email marketing efforts result in a higher purchase intention. Similarly, eWOM showed a significant positive relationship with purchase intention ($\beta = 0.991$, $t = 22.252$, $p < .001$), implying that increased eWOM enhances purchase intention.

The final regression equation derived from the model is as follows:

$$\text{Purchase Intention} = 0.958 + (-0.417 * \text{Social Media Marketing}) + (0.443 * \text{Email Marketing}) + (0.991 * \text{eWOM})$$

These findings underscore the significant influence of email marketing and eWOM in predicting purchase intention, while social media marketing shows a negative association. The adjusted R-squared value of 0.712 suggests a strong explanatory power of the model. Assumptions of linearity, independence of errors, constant variance, and normality of residuals were met, and no significant multicollinearity was detected among the independent variables.

Implication / Suggestions

The findings of this study present valuable insights for marketing managers and businesses aiming to enhance their digital marketing efforts. By understanding the influence of social media marketing, email marketing, and electronic word-of-mouth (eWOM) on consumer purchase intentions, managers can develop more effective strategies, strengthen customer engagement, and improve campaign outcomes. The study emphasizes the significant role of eWOM, which was found to have the strongest positive impact on purchase intention. To leverage this, businesses should focus on fostering trust and encouraging online reviews, testimonials, and social proof. Establishing platforms where customers can share their experiences and opinions can amplify the impact of eWOM. Proactively addressing negative feedback and showcasing excellent customer service can turn challenges into opportunities. Engaging influencers and brand advocates can further enhance the reach and authenticity of eWOM campaigns. Email marketing also emerged as a key driver of purchase intention, highlighting the importance of personalized communication. Managers should use data analytics and segmentation tools to design targeted campaigns that align with customer preferences. Dynamic content tailored to individual behaviors and purchase histories can strengthen connections and build loyalty. Employing automation tools ensures timely and relevant communication while maintaining a human touch.

Interestingly, the study revealed a negative relationship between social media marketing and purchase intention, signaling the need to reassess strategies within this channel. Managers should conduct audits to address potential issues like oversaturation, irrelevant content, or intrusive ads. To improve social media effectiveness, businesses should prioritize delivering valuable content that engages, informs, and entertains their target audiences. Strategies such as user-generated content, interactive features, and precise ad targeting can help enhance the impact of social media marketing. An integrated marketing approach is critical, given the interconnected nature of these channels. Consistent messaging across platforms and a seamless customer experience can amplify the strengths of each channel while mitigating their weaknesses. For instance, social media can drive traffic to email sign-ups, while email campaigns can amplify eWOM through user testimonials. The study's findings underscore the importance of data-driven decision-making, with the model explaining 72.3% of the variance in purchase intention. Businesses should invest in analytics and optimization tools to monitor key performance indicators like click-through rates, conversion rates, and engagement metrics, enabling continuous improvement of marketing campaigns.

Finally, fostering consumer trust remains a cornerstone of effective marketing. Transparent communication, ethical practices, and delivering on brand promises contribute to a positive brand image, ultimately strengthening purchase intention. Businesses should explore innovative strategies, such as integrating AI-driven personalization in email marketing or using social media for real-time interactions. Experimenting with emerging platforms, incorporating technologies like augmented reality in campaigns, and staying attuned to consumer trends will help businesses remain competitive and relevant in the dynamic digital landscape.

Conclusion

The study conducted at HR consultancy, exploring the effect of digital marketing on customer purchase intention among B2B clients of consultancy, provided valuable insights into the dynamics of contemporary marketing strategies. The findings underscored the significance of specific digital marketing elements and shed light on key areas for strategic enhancement. The analysis revealed that email marketing emerged as a substantial predictor of purchase intention, highlighting the importance of personalized and targeted email campaigns. Additionally, the study identified a positive correlation between social media marketing and purchase intention, emphasizing the need for HR consultancy to refine and intensify its social media engagement strategies. Furthermore, the influential role of Electronic Word of Mouth (EWOM) in shaping purchase intentions was evident. The company is encouraged to actively encourage and manage positive customer reviews, leveraging them as powerful tools for building brand credibility and trust. The sector-wise variations in purchase intention, particularly between IT and non-IT sectors, suggest the importance of tailoring marketing approaches to specific industry characteristics. HR consultancy can capitalize on these insights to design sector-specific strategies, ensuring a more nuanced and targeted approach. The multiple linear regression model, encompassing social media marketing, email marketing, and EWOM, provided a comprehensive understanding of the factors influencing purchase intention. The adjusted R-squared value of 0.914 signifies the model's robustness in explaining the variability in customer purchase intentions. As HR consultancy moves forward, it is recommended to implement the suggested strategies derived from the study. Strengthening email marketing, enhancing social media engagement, optimizing EWOM impact, diversifying marketing approaches across sectors, and maintaining a dynamic and adaptive marketing strategy are vital considerations for sustained success in influencing customer purchase intentions. This study not only contributes to the academic discourse on digital marketing but also equips HR consultancy with actionable insights to refine its marketing strategies, foster customer loyalty, and thrive in the competitive B2B landscape. The findings pave the way for continued exploration and refinement of marketing approaches, ensuring HR consultancy remains at the forefront of digital marketing effectiveness.

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**Title-From the Marketing Perspective to the Satisfaction-Managerial Perspective on the
Marketing Mix In a Chain Diagnostic Lab**

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Abstract

This study investigates the impact of various marketing mix elements on patient satisfaction from the manager's perspective in chain diagnostic laboratories. This was a descriptive cross-sectional study, and the study population was from six top-chain diagnostic laboratories in India. Forty-five questionnaires were used to collect responses from 150 decision-makers from the labs. Inferential statistical multivariate regression analysis was used to analyse the results obtained on a 5-point Likert scale. Regression analysis indicated that process and product significantly influenced patient satisfaction, with high coefficients of 0.5536 ($p < 0.0001$) and 0.427 ($p < 0.0001$), respectively, underscoring the importance of efficient service and a comprehensive test menu. Price also significantly affects satisfaction (coefficient 0.2067, $p = 0.0014$). Physical evidence has a marginal effect (coefficient 0.212, $p = 0.0536$), whereas people (coefficient -0.17, $p = 0.1268$) and place (coefficient 0.1171, $p = 0.2532$) have minimal impacts. Promotion had the least impact (coefficient = 0.0063, $p = 0.9442$), suggesting that traditional marketing did not significantly influence satisfaction. This research addresses the knowledge gap regarding the use of a marketing mix. Laboratory administrators must prioritize these key areas to improve service delivery and expand test offerings.

Keywords: Healthcare marketing, Marketing mix, Healthcare services, Laboratory marketing.

Introduction

Healthcare managers are increasingly embracing marketing as a vital tool for organizational growth and patient engagement (Agrawal & Singh, 2023). Managers recognize that effective marketing strategies can strengthen a hospital's image, increase visibility, and improve public awareness of healthcare offerings, ultimately helping to reach more potential patients and increasing patient satisfaction (Muspita et al., 2024). A modern and useful marketing tool for healthcare services is a marketing mix. Traditional marketing mix models, such as the 4Ps (product, price, place, and promotion), have been deemed inadequate for service marketing by numerous studies (Akroush, 2011). The unique characteristics of services, including intangibility, inseparability, perishability, and heterogeneity, create special marketing problems that require tailored strategies (Kotler, 2011). Booms' and Bitner's recommendations encompass three additional aspects, namely, people, physical evidence, and procedures. These elements, known as 3Ps, can significantly enhance customer satisfaction when incorporated into service deliveries. People are employees who deliver the service and whose competence, attitude, and interactions with customers. The process involves the procedures and flow of activities in delivering services. Physical evidence is the environment in which services are delivered and any other tangible element of service delivery, such as blood test reports in laboratory services (Yaghoubian et al., 2018). Hospitals, clinics, and other healthcare service providers should consider the influence of these seven elements on the relationship between the service provider and the patient (Catana & Toma, 2021). The key elements of the healthcare marketing mix that can improve healthcare marketing management are as follows: 1. Product and service quality 2. Pricing strategies 3. Distribution channels 4. Promotion and communication 5. Physical evidence; 6. People (staff training and development) 7. Process improvement (Abedi & Abedini, 2017). Marketing professionals develop products or services that resonate with consumers, keeping in mind the crucial role of balancing all the elements of the marketing mix (Marušić, 2019). It becomes important to explore the marketing mix elements from a manager's perspective, as this can provide excellent insight into the interplay between marketing strategies and organizational effectiveness. Enerson et al. (2016) emphasized the necessity of interdependence among marketing elements for successful professional service marketing. In large and complex organizations, effective leadership and centralized control over marketing functions become more critical for enhancing operational efficiency and mitigating any discord. Their research also revealed the relative importance of the marketing mix elements, with the place, physical evidence, and product being prioritized. Moreover, a significant proportion of the respondents viewed promotion and price with skepticism. This reflects a conservative attitude towards certain marketing aspects, highlighting potential gaps in understanding the full scope of marketing strategies. From the manager's perspective, the marketing mix is a flexible tool that can be adjusted frequently to meet changing market needs and dynamics (Al Badi, 2015). Business goals are achieved when the objectives are set, and the market budget is allocated accordingly (İşoraitè, 2016). The importance of each element varies depending on a company's strategy, activities, and competitive landscape (İşoraitè, 2016). On the other hand, the relationship between marketing mix components and patient satisfaction is complex. Calsum et al. (2023) reported that brand image plays a critical mediating role in influencing customer satisfaction, whereas distribution, price, and promotion have no significant effect. This underscores the importance of considering indirect effects and mediating factors when evaluating marketing mix strategies. Furthermore, it is imperative for managers to acknowledge the importance of customer satisfaction as a crucial performance indicator and predictor of future profitability and market performance.

(Praipraite, 2022). While managers generally recognize the significance of the marketing mix in influencing customer satisfaction, their perceptions may not always align with customer reality. Managers' understanding of the effective implementation of the marketing mix is crucial for influencing consumer purchase intentions and decisions. Although all the elements of the marketing mix are important, their relative impacts may vary across industries and target markets. Managers should strive for an integrated approach that considers the interplay between marketing mix elements, brand image, and demographic factors to maximize their impact on consumer behaviour and company performance. As healthcare providers continue to navigate an increasingly competitive landscape, understanding and optimizing these elements will be crucial for attracting and retaining patients, improving service quality, and, ultimately, enhancing overall healthcare delivery. Several studies have examined managers' perspectives on marketing mix implementation and its impact on the hospital segment. While most studies emphasize the significance of all marketing mix elements, one study in Saudi Arabia reported that only five of seven variables (health services, promotion, physical evidence, process, and personal strategies) had a significant effect on patient satisfaction, with pricing and distribution strategies being insignificant (Ahmad et al., 2013). Abedi et al. (2019) reported that the 'product' is the most important factor in attracting patients to private hospitals, and the 'price' is the most important factor in attracting patients to public hospitals. Various studies have concluded that prices and products are two important variables that influence healthcare marketing (Abedi & Abedini, 2017). The hospital has essential medical support, such as that provided in a laboratory. On the continuum of patient care, laboratory services, which provide complex diagnostic information, are essential for most healthcare programs (Church & Naugler, 2020). Few studies have been conducted in the laboratory on the use of a marketing mix to influence patient satisfaction. It is important to investigate the perceptions of marketing managers or decision-makers regarding the implementation of the 7Ps of the marketing mix and their impact on patient satisfaction. Abdillahi 2017 reported that the marketing mix has a highly positive and significant effect on customer loyalty in a regional health laboratory. Oktavia et al. (2016) find significant associations between several marketing mix components and customer loyalty. Specifically, product quality, promotion strategies, service processes, and physical evidence were positively correlated with customer loyalty. These elements appear to play crucial roles in fostering repeated patronage and commitment among Prodia's clientele. However, the study also revealed that price, location, and personnel did not exhibit significant relationships with customer loyalty in this context. This research gap presents an opportunity to explore the alignment between managerial perceptions and customer experiences regarding the 7Ps of the marketing mix in healthcare settings. By investigating this potential disconnect, healthcare organizations can refine their marketing strategies to better meet patient needs and expectations. Furthermore, understanding the relationship between marketing mix implementation and patient satisfaction can help healthcare providers optimize their resource allocation and improve overall service quality.

Hypothesis

- H: Service marketing mix (7Ps) has a significant effect on patient satisfaction in chain diagnostic labs.
- H1: Products have a significant effect on patient satisfaction in chain diagnostic laboratories.
- H2: Price has a significant effect on patient satisfaction in chain diagnostic laboratories.
- H3: Promotion has a significant effect on patient satisfaction in chain diagnostic laboratories.
- H4: Place has a significant effect on patient satisfaction in chain diagnostic laboratories.
- H5: People have a significant effect on patient satisfaction in chain diagnostic laboratories.
- H6: Physical evidence has a significant effect on patient satisfaction in chain diagnostic laboratories
- H7: The process has a significant effect on patient satisfaction in chain diagnostic labs.

Methods

This study was descriptive, analytical, and cross-sectional. For descriptive analysis, the demographic details of the respondents and employees' perceptions of the 7Ps of marketing were calculated on the basis of the mean and standard deviation. This study used a cross-sectional survey of six top-chain clinical laboratories in India. These are the leading chain labs in India on the basis of their market capitalization on the national stock exchange and other marketing reports (Tandon & Praxis Global Alliance, 2024). These laboratories have corporate offices in Mumbai and Delhi. Primary data collection was performed with a research questionnaire. The components of the marketing mix are laboratory services, pricing, promotion, distribution/access, physical evidence, people, and processes. Laboratory performance was assessed on the basis of patient satisfaction. This survey tool was based on previous studies (Abedi et al., 2019; Abedi & Abedini, 2017; Ahmad et al., 2013; Akroush, 2011; Bahadori et al., 2016; Abdillahi, 2017; Mayiya & Haabazoka, 2023). To check the validity of the questionnaire, a pilot study was performed, and a Cronbach's alpha score of .95 was achieved. Two hundred decision makers from six laboratories were purposively selected to respond to the 45 questionnaires. The purposive sampling method better matches the sample to the research objective, leading to trustworthy data and results (Campbell et al., 2020). These decision makers are the sales, marketing, and center managers of chain diagnostic laboratories. Responses were measured on a 5-point Likert scale ranging from 5 (strongly agree) to 1 (strongly disagree). The Zoho survey link was sent via WhatsApp and mail to obtain responses. Filled questionnaires were received from 150 managers. We

used regression analysis as inferential statistics to determine the relationships between the independent and dependent variables. The multiple regression model significantly explains the relationship between independent variables and dependent variables (Ahmad et al., 2013).

Results

Descriptive analysis

This section provides an overview of the respondents' characteristics and a clear perspective on the laboratory managers investigated. The overall experience of these managers in the industry is more than ten years. Most were postgraduate students in the science and management streams. The minimum age of the respondents was 32 years, and the maximum age was 54 years. Approximately 40% of the respondents were from the sales team involved in managing the customer front and implementing marketing activities. Thirty percent of the respondents were centre managers, who were primarily involved in the implementation of marketing strategies; the details of their demographic characteristics are mentioned in Table 1.

Table 1 Demographic characteristics of the study participants

		Chain	Percentage
Sample size		150	100%
Work Experience			
	10-15 Years	50	33%
	15-20 Years	60	40%
	>20 Years	40	27%
Qualification			
	Bachelor's degree	23	15%
	Master or PhD	127	85%
Position			
	Marketing managers/Product managers	47	31%
	Sales managers	59	39%
	Centre managers	44	29%

Regression analysis

It is assumed that the marketing mix elements positively and significantly influence patient satisfaction. Multiple regression analysis is a widely used method for investigating the relationship between one dependent variable and multiple independent variables (Uyanık & Güler, 2013). We applied multiple regression analysis as an inferential tool to test this hypothesis. Table 2 presents the output of the regression analysis of the dependent variable of patient satisfaction, and the independent variable is the 7Ps of marketing.

$$\text{Patient Satisfaction} = -2.844 + (-0.17 \times \text{People}) + (0.212 \times \text{Physical}$$

$$\text{Evidence}) + (0.1171 \times \text{Place}) + (0.2067 \times \text{Price}) + (0.5536 \times \text{Process}) + (0.427 \times \text{Product}) + (0.006307 \times \text{Promotion})$$

Table 2 shows the results of the multivariate regression analysis.

Independent variables	Coefficient	Std. Error	t	P
(Constant)	-2.844			
People	-0.170	0.111	-1.536	0.127
Physical evidence	0.212	0.109	1.946	0.054
Place	0.117	0.102	1.147	0.253
Price	0.207	0.064	3.256	0.001
Process	0.554	0.110	5.028	<0.0001
Product	0.427	0.095	4.516	<0.0001
Promotion	0.006	0.090	0.070	0.944

The value of the intercept is -2.84, which means that if the independent variables have no impact, patient satisfaction will be very low. If the other variables are constant, each coefficient represents the expected change in patient satisfaction with a one-unit change in the respective variable. A positive value indicates a positive relationship between independent and dependable variables, whereas a negative coefficient signifies a negative relationship (Ahmad et al., 2013). In this study, patient satisfaction, as measured by the manager's response, increased by .55 with each unit increase in the process, .43 by each unit change in price, and .21 by each unit change in price. A P value < 0.05 indicates that the relationship between the independent variable and the dependent variable is statistically significant. In this model, the process, product, and price had a significant effect

on patient satisfaction. For physical evidence ($p = 0.0536$), this variable is close to significant, with a positive coefficient of 0.212, indicating that it may influence satisfaction, but it is slightly above the common threshold of 0.05. Place ($p = 0.2532$) and promotion ($p = 0.9442$): Neither place nor promotion significantly affected patient satisfaction.

Interestingly, the coefficient was negative, with a value of -0.17, which means that an increase in the score for "people" (e.g., staff and personnel interactions) was associated with a slight decrease in patient satisfaction. This result is surprising, as we would typically expect "People" to positively influence satisfaction, especially in a service-oriented context such as healthcare. This may be because of a manager's perception mismatch or nonlinear correlation. Managers are likely to overestimate or misinterpret the impact of staff interaction. In chain labs, the ability of doctors to answer patient questions is limited. Although the P value was .127, the relationship between these variables was insignificant. However, further studies are needed to confirm this hypothesis. Place ($p = 0.2532$) and promotion ($p = 0.9442$): Neither place nor promotion significantly affected patient satisfaction.

A higher t value indicates a greater level of impact on the dependent variable. Generally, higher absolute t values (typically above two for many applications) indicate that the coefficient is likely to be significantly different from zero. In contrast, lower t values suggest that it may not be significant. The process has the greatest impact, followed by the product, price, and physical evidence. The R² value was .831, which indicates that approximately 83.1% of the variance was accounted for by the model, which is suggestive of the goodness of fit between the model and data. The adjusted R² value was high at .822, which accounts for the number of predictors in the model and further justifies the robustness of the model.

Table 3 shows a model summary (R square).

Sample size	150
Coefficient of determination R ²	0.831
R ² -adjusted	0.822
Multiple correlation coefficient	0.911
Residual standard deviation	2.090

Table 4 summarizes the hypothesis testing results.

Hypothesis	Relationship	Results
Product→ Patient satisfaction	<0.0001	Accepted
Price→ Patient satisfaction	0.001	Accepted
Promotion→ Patient satisfaction	0.944	Rejected
Place→ Patient satisfaction	0.253	Rejected
People→ Patient satisfaction	0.127	Rejected
Physical evidence→ Patient satisfaction	0.054	Rejected
Process→ Patient satisfaction	<0.0001	Accepted

Discussion

Today, the healthcare system is facing competition, and patients are at the center of the system. This has led to a greater emphasis on patient-centered approaches and quality improvement initiatives. Service offerings and delivery are interconnected aspects that impact overall customer satisfaction and the organization's reputation. Laboratory testing is an integral part of the overall healthcare package involved in the clinical decision-making process and provides essential diagnostic services (Chidzaye, 2019). This study aims to understand managers' perspectives on the use of marketing mix elements that influence patient satisfaction in clinical laboratories. The results showed that the service–marketing mix variables significantly influenced patient satisfaction. These findings are unique and represent the manager's view of the influence of the marketing mix on overall patient satisfaction. The results obtained were comparable to those of other studies conducted on similar subjects. Fadhilah and Katmini (2023) concluded that there is a relationship between the marketing mix and customer satisfaction. A similar study by Oktavia et al. (2016) revealed that customer loyalty is influenced by product quality, promotions, processes, and physical evidence rather than by price, location, or staff interactions. In his doctoral dissertation, Su (2019) reported that price significantly influences customer satisfaction. For doctoral dissertations, Zaw 2023 reported that reliability, people, and test availability have a significant influence. There

are few studies available on the effects of various components of the marketing mix on patients in clinical laboratories from the manager's perspective.

We compared our results with those of other studies conducted in the healthcare sector. Customers place more emphasis on the availability of tests and the quality of reports from a product or service point of view. This finding is similar to the results of other studies conducted in laboratory and hospital settings (Ahmad et al., 2013). This suggests that laboratories should focus on enhancing their menus and introducing new tests. The price of chain labs is high and critically influences customer satisfaction. Higher prices negatively influence customer satisfaction. As such, there are no government regulations on the pricing of clinical laboratory services, as in the pharmaceutical industry (Kolte et al., 2021). The availability of discounted healthcare packages and other discount offers positively affects customer satisfaction. Prices are determined primarily on the basis of competition. The place component is access to the services. Surprisingly, the place component does not have a significant correlation with customer satisfaction from the manager's perspective. These findings are similar to those of previous studies (Gonaldy et al., 2023; Gümüş, 2022). This may be because of the home collection services provided by laboratories and multiple open outlets across geography.

The results did not reveal any significant correlations between promotions and satisfaction. This finding corroborates those of other similar studies (Purba et al., 2019). In this study, the person element had no impact on patient satisfaction, but managers felt that there was a need for further training of the customer staff. The highest significant correlation was found for process elements, which correlated with all other major studies conducted in this area (Dawande et al., 2022; Oktavia et al., 2016). All process items, including turnaround time, waiting time, laboratory opening hours, tracking sample reports, and patient confidentiality, positively influence customer satisfaction (AGGARWAL et al., 2022; Widyowati et al., 2023). This finding is important because process elements significantly contribute to service quality and overall customer satisfaction in the service industry.

Additionally, the adoption of digital engagement and lean principles in service delivery has shown promising results (Narolita et al., 2020). Few of our findings are different from those of other studies conducted in the hospital sector. In hospitals, the physical environment and people are important influencing factors (Ravangard et al., 2020; Yaghoubian et al., 2018). In clinical laboratories, customer interaction is limited to the sample collection process only. This may be the reason that physical evidence and people are not important influencing factors in laboratory services.

Conclusion

From a managerial perspective, this study addresses a knowledge gap regarding how different marketing mix components influence patient satisfaction. Process optimization and product availability are two crucial elements that enhance service quality and meet patient expectations. Laboratory management must focus on introducing new tests and improving service delivery processes. Price has emerged as an influential factor, with higher prices negatively affecting patient satisfaction. This can be overcome by bundling tests in the package and providing an adequate discount so that customers perceive it as valuable for money. The result for physical evidence was marginally significant, with a positive coefficient. This finding shows that facility ambience might not be fully impacted but that the reporting format and easy interpretation are significant.

Implications of the study

This study provides an evidence-based understanding of the importance of marketing mix elements for patient satisfaction. More resources need to be allocated for process optimization, digital transformation, technology introduction, staff training, and enhancing accessibility beyond physical locations. The strategic pricing model balances affordability and profitability. Expenditures on traditional promotion models need to be reduced, and greater emphasis must be placed on the quality of reports and service delivery.

Limitations

This study considers managers' views on the impact of the marketing mix. There is a need for similar studies from the patient perspective.

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Occupational Health and Safety of women at workplace: Ideas from past literature

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Abstract

The rapid industrialisation has brought to the forefront the concept of occupational health and safety among the different classes of workers. In this context the health and safety of women workers at workplace is also bring examine closely by researchers. This is evident from vast amount of literature already published on occupational health and safety equally with regard to women workforce. As the studies are published in different national and international journals, it become difficult to comprehend the different methodologies as well as these major observations. In order to fill the research gap, in present article we attempt to review selected research studies on OHS of women.

Based on the reviews, it is observed that the authors use the cross-sectional data from respective industries and also use statistical techniques such as logistic regression, correlational analysis to test their hypothesis. At the end it is concluded that gender has become an important factor in occupational health and safety in industries.

Keywords: Occupational Health, Gender, Occupational risk

Introduction

Occupational safety and health (OHS) refers to the practices and policies implemented to ensure the safety, health and well-being of employees in their workplace. Effective workplace safety programs aim to prevent injuries, illnesses and deaths in the workplace. However, according to the ILO, 48.5% of the global workforce and 27.6% of the agricultural workforce are now women (in low-income countries the figure is 66.5%). The labor market is still highly segregated. Women and men still work differently, and women and men may face different physical and psychological hazards and risks in the workplace. Occupational segregation of men and women can lead to false assumptions about who is and is not at risk and create barriers to employment in certain sectors.

The majority of (unpaid) work in the household is carried out by women, including cooking, cleaning, fetching fuel and water, and caring for children and adult relatives. According to data from UN Women, women do at least 2.5 times as much unpaid care and domestic work as men. In addition, women are more likely to work part-time and also do paid work. According to the Women Brain Project, the stress caused by caregiving tasks increases the risk of a number of mental illnesses as well as stress-related illnesses. For example, women are more likely than men to develop multiple sclerosis, meningiomas (brain tumors), or Alzheimer's disease.

Although women may perform the same work as men, research in occupational health and safety (OHS) tends to focus exclusively on men. Occupational Exposure Limits (OELs) are intended to protect all workers, but they should not be viewed as a clear boundary between safe and unsafe. However, they are typically based on laboratory tests and studies on men. Even medical studies that impact women are always conducted on male subjects, such as laboratory-bred mice.

The hormones and immune systems differ between men and women, which can affect the absorption of chemicals. Because women typically have thinner skin and are smaller than men, they may be safely exposed to fewer toxins. Women have a higher percentage of body fat, which can lead to the accumulation of certain chemicals, exacerbating the lower threshold of tolerance. (Criado Perez, C., 2019)

The phrase "gender neutral" may be appropriate in some contexts, but, given the over-reliance on OHS data on men, a gender-neutral approach to occupational health and safety is harmful to women. In order to make decisions that impact their health and safety at work, OHS must take an inclusive, integrated, and gender-responsive approach. This includes gathering and relying on relevant evidence and making sure that both men and women are involved in a timely manner.

The aim of this paper is to critically review the literature on the present status of occupational health and safety at workplace, focusing on the challenges women face in this field and strategies to increase gender diversity. The review aims to shed light on the importance of gender diversity in promoting timely organizational success and employee well-being.

OBJECTIVES

CSIBER International Journal – CIJ

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To identify the methodologies adopted in studies on Occupational health and safety status among women workers at workplace.

To highlight the importance of gender differences should be considered in the development of occupational safety and health (OSH) policies and prevention strategies.

RESEARCH METHODOLOGY

Various research studies focusing on the safety and health of women in the workplace were reviewed and examined. This paper conducted content and document analysis as well as reviews of the chosen studies.

Online search engines were used for thorough literature and data research. Some publications such as PubMed, Elsevier Journal Storage and Economic and Political Weekly were included in the search. The all 20 papers on the topic of occupational safety and health protection for female employees in various industries and some gendered perspectives are reviewed, which were published in renowned journals. The majority of articles focused on gender viewpoints. These articles cover a remarkably wide range of experiences, but their scope is limited.

Content Analysis of The Literatures

Srivastava A.K and Bihari V. (2000) in these paper “Occupational Health for Women: A current Need” highlights the unique workplace health challenges faced by women, particularly as their labor force participation increases. It discusses how women's diverse roles as workers, mothers and housewives contribute to their health vulnerabilities and highlights the need for tailored workplace health policies. The authors show that around one in 300 women suffer from work-related illnesses, highlighting the urgent need to improve occupational health services for women. The paper argues for the development of national policies that specifically address the safety and health of women in the workplace, taking into account their specific roles and the potential conflicts arising from these responsibilities. It emphasizes the importance of linking workplace health with other sectors and promoting intersectoral collaboration to improve the effectiveness of women's health services and create a supportive workplace environment.

An article “Why do workers behave unsafely at work? Determinants of safe work practices in industrial workers” by **Garcia et al. (2004)** examines the relationship between safety climate – workers' perceptions of management's attitude towards workplace safety – and their behavior in the pottery industry in Castellon, Spain, using a cross-sectional survey of 734 production workers. A Safety Climate Index (SCI) was developed which gave an average value of 71.90 (SD 19.19), with values in smaller workplaces being significantly lower than in larger ones. Results show that lower SCI scores ($SCI < 50$) correlate with increased unsafe behavior and noncompliance with safety regulations, highlighting the strong influence of safety climate on workers' attitudes toward safety. The authors note that understanding these organizational factors is critical to improving occupational health and safety and recommend longitudinal studies to further investigate this relationship.

According to **Martín-Fernández et al. (2008)** This study analyses the influence of work-family conflicts on the causes of minor accidents at work among working women. A survey was conducted among working women in the Madrid region who had suffered a minor accident at work in 2004. The key finding was that almost half of the women who had children felt that trying to balance work and family caused stress and fatigue, which contributed to the accident; 21% of respondents who had an accident on the way to or from work and 11% of respondents who had suffered an accident at work said family problems were a factor. Additionally, the accident impacted 50% of women; Almost a quarter of those surveyed said that their work situation had temporarily changed; and in almost one in four cases the children had to adapt their daily routine. This suggests that measures are needed to motivate men and employers to play a greater role in resolving work-family conflicts. The first result suggests that a significant proportion of respondents – regardless of economic sector or level of education – may have been suffering from work and family stress at the time of the accident. Accidents occurred more frequently on the way to and from work than at the actual workplace. The study also found that women were undermotivated at work and that this undermotivation was linked to a lack of work-life balance for many of those surveyed.

The article by **Papadopoulos G (2009)** examine the impact of workplace changes on public health, occupational health and workers' social lives. It is consistent with the World Health Organization and International Labor Office's definition of health and focuses on promoting the physical, mental and social well-being of workers. The research suggests that data on occupational diseases and accidents under flexible working arrangements is limited, highlighting the challenges in identifying and managing occupational health and safety risks. The authors point out that the competitive market can adversely affect workers' wages, conditions, and social lives, necessitating a broader approach to health and safety that goes beyond mere work capacity preservation. The study underscores the complexity involved in multi-criteria decision-making for risk assessment and prevention, particularly in a changing work environment. To effectively tackle the emerging challenges in OSH, the authors advocate for the

use of appropriate methodologies and comprehensive research that considers various parameters. They also note that cost-benefit analyses in a competitive market impose constraints that must be navigated to implement effective OSH measure

The article by **Constance J. Newman, Daniel H. de Vries, Jeanne d'Arc Kanakuze, and Gerard Ngendahimana (2011)** investigates the relationship between workplace violence and gender discrimination in Rwanda's health workforce. The research involved a random selection of 15 districts from a total of 30, with 44 healthcare facilities chosen for the study. A total of 297 health workers participated, including 205 women and 92 men. Data collection methods included focus groups, facility audits, key informant interviews, and health worker surveys, employing a utilization-focused approach.

The findings revealed that 39% of healthcare professionals reported experiencing workplace violence in the previous year, with patterns of victimization and violence perpetration being closely tied to gender. The study identified that negative stereotypes, pregnancy-related discrimination, the "glass ceiling," and family responsibilities significantly impacted female health workers, contributing to a hostile work environment. Conversely, the presence of gender equality was associated with a reduction in violence against health workers. The authors argue that tackling gender inequality should be a priority in research and policy development regarding workplace violence. By concurrently addressing these issues, it is anticipated that workplace safety and equity in the health sector will improve, leading to enhanced employee retention, productivity, and the overall enjoyment of human rights at work. The article emphasizes the importance of stakeholder engagement in the research process to ensure that findings effectively.

The research article titled "Occupational Safety and Health in India: Now and the Future" by **Shyam Pingle (2012)** examines the current state and future requirements of occupational safety and health (OSH) in India. With a population exceeding 1.2 billion, 63.6% of whom are of working age, a significant portion (over 90%) is engaged in the informal economy, primarily within agriculture and services, while less than 10% are employed in the organized sector. The article identifies several OSH challenges, including a large workforce in the unorganized sector, the availability of cheap labor, low public health spending, inadequate implementation of existing legislation, and a shortage of trained OSH professionals. Key occupational health risks mentioned include accidents, pneumoconiosis, musculoskeletal injuries, chronic obstructive lung diseases, pesticide poisoning, and noise-induced hearing loss. The existing legal framework, primarily the Factories Act (1948) and the Mines Act (1952), provides guidelines for worker safety but mainly covers the organized sector, leaving the unorganized sector largely unregulated. Pingle emphasizes the urgent need for legislation to extend OSH coverage to all sectors, increased awareness among stakeholders, the development of OSH infrastructure, and the integration of occupational health into primary healthcare systems. The article concludes with optimism for improvement in OSH standards in India, driven by the emergence of a younger, educated workforce and increasing awareness influenced by globalization, serving as a call to action for enhanced legislative measures and awareness campaigns to improve worker safety and health.

The research article "Occupational Health and Safety in Small Scale Mining: Focus on Women Workers in the Philippines" by **Jinky Leilanie Lu (2012)** highlights the health and safety conditions faced by women in the small-scale mining sector, which serves as a significant source of income in various developing countries, including the Philippines. Using secondary data from governmental organizations such as the Department of Labor and Employment and the Mines and Geosciences Bureau, as well as information from non-governmental organizations, the study examines the occupational safety and health conditions specific to women in mining. The findings reveal that women in this sector encounter numerous challenges, including the need to balance work and home responsibilities, exposure to harmful chemicals like cyanide and mercury during gold extraction, and respiratory issues due to dust from minerals. The labour-intensive nature of mining work, combined with the absence of a social safety net, forces women to work longer hours under dangerous conditions. The article advocates for the adoption of gender-sensitive practices to improve women's occupational health and safety in small-scale mining. It emphasizes the need for women to access alternative, environmentally sustainable employment opportunities to achieve long-term development goals. Furthermore, any policy response must prioritize gender equality and equity, recognizing the diverse roles women play in both public and private spheres, as these factors significantly impact societal stability. Overall, the study calls for targeted interventions to enhance the safety and health of women workers in the mining industry.

Doret Botha and Freek Cronje (2015) investigate the perceptions surrounding the safety and health of women working in core mining roles. Motivated by the lack of published information on the specific health and safety issues faced by women in the mining industry, the study employs a mixed-methods research design, incorporating both quantitative and qualitative approaches.

Quantitative data was collected through a structured questionnaire, while qualitative insights were gathered from interviews with individuals and groups. The findings highlight several critical factors that must be considered to ensure the health and safety of women in core mining positions, including physical work capacity, anthropometry and body composition, the adequacy of personal protective equipment, considerations for pregnant workers, and the implementation of security measures. The research emphasizes the necessity of advancing the health and safety of women to retain them in the mining workforce while fulfilling essential industry functions. It concludes with actionable recommendations aimed at addressing the health and safety concerns of women in core mining activities, which can be utilized and implemented by various stakeholders within the mining industry.

Gizem Akalpa et al. (2015) investigates the perceived risk factors affecting female employees in the Turkish metal industry, assess their perceptions of safety culture regarding occupational illnesses and accidents, and explore their beliefs about fatalism related to occupational risks. The study is motivated by the need for scientific data to enhance protective measures for women working in this sector, where female employment is notably low. The researchers employed a simple random sampling method to select women employed in the metal industry, collecting data through survey forms specifically designed for this study. A total of 1,750 women participated, with a 61 percent return rate resulting in 582 usable surveys after data cleaning. The findings reveal that female workers in the metal industry perceive various safety risks and exhibit beliefs related to fatalism concerning occupational accidents.

The authors emphasize the importance of raising awareness about the challenges faced by women in this industry, as they belong to a specific risk group. They argue that effective safety behaviour can be fostered by ensuring employees adhere to company policies designed to protect their well-being. The study advocates for a collaborative approach between employers and employees to address workplace health and safety issues, highlighting the role of interdisciplinary ergonomists in promoting individual and organizational welfare. By implementing reward and punishment systems for compliance with safety protocols, the study suggests that occupational illnesses and accidents can be significantly reduced, benefiting both workers and companies.

The research paper "Work Related Health Issues Faced by Women in India" by **N. Savitha and Prasanth M (2016)** reviews various studies concerning the health risks encountered by working women in India across multiple industries, including textiles, construction, leather, banking, and call centers. The authors note a significant gap in research regarding workplace health risks, particularly concerning violence and sexual harassment faced by women in these sectors. The paper discusses how different hazards impact female workers and the safety measures they adopt to protect their health. It highlights that the availability and accessibility of jobs for women serve as important indicators of economic and social inclusion. However, women workers often face poor working conditions, unfair labour practices, low wages, and exposure to various occupational hazards. The authors emphasize that existing laws are the primary source of guidance for the majority of working women in India. They advocate for the necessity of integrating workplace safety and health considerations into policies at all levels, recognizing these as critical issues that require attention to improve the overall well-being of women in the workforce. Overall, the study calls for increased awareness and action to address the health and safety challenges faced by women workers in India.

The research article by **Izaskun Larrieta-Rubín de Celis et al. (2016)** presents a novel management strategy for integrating occupational health and safety (OHS) with a gender perspective within corporate social responsibility (CSR). The study aims to assess how well gender considerations are incorporated into OHS management practices in Spanish businesses recognized for their commitment to gender equality (GE). To gather empirical data, the authors conducted an online survey in 2013 targeting management team members responsible for CSR, gender, and diversity in these companies. The findings reveal that while the companies have moderately developed various OHS practices, there are notable exceptions. Specifically, policies designed to prevent, prohibit, and penalize sexual harassment in the workplace received a high implementation score (4.38), as did support provisions for victims of gender-based violence (3.81).

This paper addresses a significant research gap concerning women, OHS, and CSR by proposing a management strategy that transcends biological differences and focuses on a set of actionable practices. It highlights the need for a more comprehensive approach to managing OHS with a gender perspective, thereby advancing the conversation around women's occupational health and safety within the context of corporate social responsibility.

In their review titled "Gender Issues on Occupational Safety and Health," **Sorrentino et al. (2016)** examine the progress made and the persistent challenges regarding gender disparities in occupational safety and health (OSH) within Italy. The authors note that while Italy has enacted new legislation that aligns with European provisions

and promotes gender equality in the workplace, significant obstacles remain in the effective implementation of these laws. They highlight the scarcity of measurements regarding women's occupational exposure, indicating a need for innovative approaches to establish a clear connection between occupational exposure and risk factors specific to women. The authors suggest that susceptibility analyses should consider hormonal time frames to better understand environmental interactions at work.

Furthermore, **Sorrentino et al. (2016)** emphasize the importance of enhancing gender sensitivity in the collection and analysis of sex-disaggregated data on occupational diseases and injuries. They argue that addressing health disparities between men and women in the workplace requires systematic collection, management, and analysis of such data. This approach is essential for planning, monitoring, and assessing the effectiveness of preventive measures and policies related to OSH.

The study "The Need for Detailed Gender-Specific Occupational Safety Analysis" by **Fernanda Cruz Rios, Wai K. Chong, and David Grau (2017)** aims to highlight the disparities in workplace injury rates between male and female employees. The authors argue that for regulations and policies to effectively address gender disparities in health and safety, there is a pressing need for gender-specific data analyses.

The paper reviews previous public data on both fatal and nonfatal injuries to illustrate the necessity of incorporating gender considerations into occupational safety and health assessments. It points out that the reported numbers of workplace injuries for men and women may not accurately reflect the actual situation, as both employers and employees often fail to report certain non-fatal injuries. Additionally, female employees in nontraditional occupations may hesitate to report harassment and injuries due to fears of job loss or the desire to prove their value to supervisors and colleagues by not raising safety concerns.

Simone De Sio et al. (2017) investigates the quality of working life among employees in a shared workspace, focusing on gender differences in exposure to psychosocial risks and perceived well-being. The research highlights the importance of considering gender, as mandated by European Commission regulations. A sample of 144 office workers was selected, comprising 33 females and 74 males, with a structured working schedule from 8:30 a.m. to 5:15 p.m. Participants completed an anonymous clinical medical history questionnaire that included only age and job seniority, ensuring a homogeneous sample through stratified random sampling. The study utilized the HSE-IT questionnaire developed by the Health and Safety Executive to evaluate psychosocial risks.

The findings revealed that the overall Cronbach's alpha coefficient for the HSE-IT questionnaire was 0.876, indicating good reliability. The male sample scored slightly higher (0.885) than the female sample (0.830). Results indicated that office workers experience job-related stress, particularly in the "Relationships" domain, which was viewed negatively across all groups, with women scoring the lowest. The authors emphasize that individual traits, particularly gender, should be integral to risk assessments regarding the quality of working life, underscoring the need for tailored approaches to address the specific psychosocial risks faced by male and female employees. The authors emphasize the importance of public organizations, particularly in the U.S., conducting further research that examines occupational safety data through a gender-specific lens. They advocate for the systematic recording of gender-specific data by industry and occupation within the Department of Labor to better inform policies and improve workplace safety for all employees.

In **Curtis et al. (2018)** examine the health and safety challenges faced by women in the construction industry, which remains predominantly male despite an overall increase in women's workforce participation. The authors highlight that the physical and psychological risks affecting tradeswomen are not well-documented, particularly in the context of a hazardous work environment characterized by hostility and discrimination. Using a holistic approach to health, the researchers considered the influences of both home and workplace environments, as well as the social experiences of women. Nearly 300 workers from Washington State participated in the study, comprising 198 tradeswomen and 93 tradesmen. The authors employed logistic regression to analyze the relationship between psychosocial exposures and stress and injury outcomes, alongside descriptive statistics to compare gender-based exposures.

The findings revealed that tradeswomen were significantly more likely than their male counterparts to report work-related injuries in the previous year (31% versus 18%) and to experience high levels of perceived stress. Notably, ten out of twelve identified psychosocial exposures were associated with either injuries (such as sexual harassment, overcompensation, bullying, isolation, and gender and age discrimination) or stress (including job strain and harassment), with a pronounced impact on women.

The author conclude that the construction industry is insufficiently addressing the health and safety needs of tradeswomen. The study underscores the importance of recognizing various exposures—such as discrimination,

excessive compensation demands, and challenges related to work/life balance—that significantly affect the well-being of employees. The results emphasize the need for targeted interventions and highlight the complex interplay between gender, psychosocial exposures, and occupational risks in the construction trades.

In the study "Occupational Health Hazards among Women Workers in Healthcare Industry: An Analysis," **Jayaselvi (2020)** investigates the occupational health hazards and overall health status of women workers in the healthcare sector in Thoothukudi, Tamil Nadu. The research involved a sample of 120 unorganized female workers, selected through random sampling, and utilized statistical tools such as the Chi-Square test, frequency tables, and cross-tabulation to analyse the data. The findings indicate a significant correlation between occupational health hazards and the health status of the participants. Many women reported experiencing fever related to their jobs, with an average self-reported health status. Interestingly, those who suffered from malarial illness described their health as generally good. However, the study revealed that a considerable number of participants experienced nausea for various reasons, and those with body pain reported extremely poor health, suggesting that chronic pain severely impacts their overall well-being.

The author emphasizes the persistent health risks faced by healthcare professionals, noting that while some health issues are preventable, chronic occupational diseases pose significant challenges. The study concludes that improving the health and safety conditions for female workers in healthcare is crucial for enhancing their well-being, which in turn can positively influence the country's economic growth. The author advocates for increased government focus on ensuring that women workers have access to essential safety measures in their workplaces to mitigate these health hazards.

Mustari et al. (2020) examines the implementation of occupational health and safety (K3) protections for female workers in Makassar City. The research utilizes three types of legal materials: primary legal materials in the form of labor legislation, secondary legal theory and principles, and tertiary legal materials from law journals and articles. Data was gathered through the examination of documents and conducting interviews.

The authors highlight that women workers require specific K3 protections due to their unique biological characteristics, particularly reproductive functions. This necessity for special protection is underscored by Article 7 of the Covenant on Economic, Social, and Cultural Rights. However, the study points out a prevalent misconception among employers that "affirmative action" or special protections are limited to rights such as maternity leave, menstruation leave, and abortion.

Despite the legal framework in place, which includes Law No. 13 Tahun 2003 concerning workforce protections, the study reveals that there are still gaps in the actual implementation of K3 protections for women workers. The authors note that local labor inspectors are tasked with monitoring compliance and addressing violations of work norms, yet challenges remain in ensuring that all aspects of occupational health and safety are adequately enforced for female employees.

In their literature review, **Tejamaya et al. (2021)** seek to create a model for an occupational safety and health management system (OSHMS) specifically designed for micro, small, and medium enterprises (MSME) in Indonesia. The study systematically reviews existing research to identify key factors that influence the successful implementation of OSHMS in these enterprises. Utilizing an exploratory approach, the authors employed the "AND" strategy to search multiple online databases, focusing on a combination of keywords related to the target population and exposure variables as outlined in the PROSPERO Approach. The selection of literature followed the PRISMA flowchart methodology, and the quality of the evidence was assessed using the Critical Appraisal Skill Programme (CASP) checklist to evaluate the risk of bias.

From the review of 37 relevant papers, books, online resources, and local articles, the authors identified critical elements essential for the implementation of OSHMS in MSMEs. These elements are categorized into three groups: downstream factors (including OSH training, commitment, risk management, and communication), middle stream factors (such as third-party support), and upstream factors (highlighting the role of government). This comprehensive analysis provides valuable insights for enhancing occupational health and safety practices within Indonesia's MSME sector.

In the article "The Role of Women in Occupational Health and Safety Management: A Gender Perspective," **Mubita, Milupi, and Monde (2023)** investigate the specific risks and hazards faced by women in the workplace, the challenges they encounter in occupational safety and health management, and propose strategies for enhancing their involvement in these areas. The authors conducted a comprehensive review of existing studies on women's health and safety at work, employing document analysis and content reviews to identify and analyze the unique risks women face. The findings reveal a significant gender gap in occupational health and safety management

positions, indicating that despite progress in gender equality, women remain underrepresented in leadership roles within this sector. This disparity is attributed to systemic barriers and societal gender biases that limit women's participation and advancement in traditionally male-dominated fields.

The article highlights that the presence of women in management roles related to occupational health and safety positively influences workplace safety outcomes and organizational performance. Research suggests that women bring valuable perspectives, skills, and problem-solving approaches to these positions, which enhance decision-making processes, foster diverse opinions, and create a more inclusive work environment. These factors collectively contribute to improved risk management and safety protocols in organizations.

In Arshitha SJ & Murugan K (2024) study aim to identify the safety and health factors that affect the job performance of women employees, analyse the safety measures implemented by organizations, determine the influence of occupational health and safety (OHS) on job performance, identify health hazards faced by women in the IT sector, and examine employees' perceptions towards OHS.

Utilizing a descriptive research design, the study finds that OHS procedures significantly impact the job performance of women workers in the IT industry. The null hypothesis was accepted, as the significant value ($p = 0.306$) was greater than the threshold of 0.05, indicating negligible differences between work experience and safety measures. The authors conclude that organizations can enhance job performance by fostering a secure, supportive, and inclusive work environment that addresses the specific challenges faced by women in the sector, ultimately optimizing their contributions to organizational success.

MAIN OBSERVATIONS

Based on the review of the selected articles, we present the main observations from the studies on OHS with reference to women.

There is an urgent need for comprehensive and culturally sensitive occupational health services personalized to the specific needs of working women, particularly in agriculture and the informal sector. It emphasizes the importance of prevention, health promotion and protection, while highlighting the need for improved data collection on occupational health to provide effective guidelines and standards.

There is a strong influence of safety climate on employees' attitudes towards safety. Understanding organizational factors is critical to improving occupational health and safety and recommends longitudinal studies to further investigate this relationship.

Almost half of the women who had children felt that balancing work and family caused stress and fatigue, which contributed to the accident. Measures are needed to motivate men and employers to become more involved in resolving work-family conflicts. Women were undermotivated at work and, for many of those surveyed, this undermotivation was related to a lack of work-life balance.

Identifying and addressing occupational safety and health (OSH) risks presents significant challenges, especially within a competitive market that adversely impacts workers' wages, working conditions, and social well-being. A holistic approach to health and safety is essential, one that emphasizes the overall welfare of employees instead of solely concentrating on their ability to work.

Negative stereotypes, discrimination related to pregnancy, the "glass ceiling," and family responsibilities contributed to a hostile work environment for female health workers. Conversely, greater gender equality was associated with reduced violence against health workers.

The emergence of a younger, better-educated workforce and a growing awareness influenced by globalization have raised hopes for improving occupational safety and health (OSH) standards in India. Stronger legislative measures and awareness campaigns aimed at enhancing worker safety and health are being implemented as a result of this circumstance.

The improvement of women's safety and occupational health in small-scale mining through the implementation of gender-sensitive practices. It highlights how important it is for women to have access to environmentally friendly, alternative work options in order to meet long-term development objectives. Gender equality and equity must also be given top priority in any policy response, acknowledging the variety of roles that women play in the public and private domains, since these aspects have a big influence on the stability of society.

A number of important factors need to be taken into account in order to guarantee the health and safety of women working in core mining positions. These include physical work capacity, body composition and anthropometry,

the suitability of personal protective equipment, pregnant workers' needs, and the application of security measures. promoting women's health and safety in order to keep them working in mining and enable them to perform vital industry tasks.

The perceptions of female employees in the metal industry regarding workplace accidents are associated with fatalism and a variety of safety hazards. By implementing reward and punishment systems for compliance with safety protocols, the study suggests that occupational illnesses and accidents can be significantly reduced, benefiting both workers and companies.

The fact that jobs are readily available and within reach for women is a significant sign of their involvement in the economy and society. Unfortunately, women in the workforce often grapple with challenging work conditions, unjust labour practices, low pay, and potential exposure to various occupational risks. The necessity of integrating workplace safety and health considerations into policies at all levels, recognizing these as critical issues that require attention to improve the overall well-being of women in the workforce.

The companies have moderately developed various health and safety practices, there are notable exceptions. In particular, policies to prevent, prohibit and punish sexual harassment in the workplace received a high implementation rating (4.38), as did support measures for victims of gender-based violence (3.81).

Italy has introduced new laws that are in line with European regulations and promote gender equality in the workplace. However, significant obstacles remain to the effective implementation of these laws. Addressing health inequalities between men and women in the workplace requires systematic collection, management and analysis of this data. This approach is essential for planning, monitoring and evaluating the effectiveness of preventive measures and policies related to occupational safety and health.

Due to the fact that both employers and employees frequently neglect to report certain non-fatal injuries, the reported numbers of workplace injuries for men and women may not be correct. Additionally, female employees in nontraditional occupations may hesitate to report harassment and injuries due to fears of job loss or the desire to prove their value to supervisors and colleagues by not raising safety concerns.

The "Relationships" domain significantly impacts both genders. Two domains—"Demand" and "Support from Managers"—were uniquely identified in the female sample. The female participants reported the lowest levels of perceived well-being.

Tradeswomen reported high levels of perceived stress and were much more likely than their male counterparts to report work-related injuries in the past year (31 percent versus 18 percent). Notably, ten of the twelve psychosocial exposures that were found were linked to either stress (including job strain and harassment) or injuries (like sexual harassment, overcompensation, bullying, isolation, and gender and age discrimination), with a particularly strong effect on women.

There is a strong relationship between the participants' health and occupational health risks. Despite having an average self-reported health status, many women reported having fevers associated with their jobs.

Women workers require specific K3 protections due to their unique biological characteristics, particularly reproductive functions. This necessity for special protection is underscored by Article 7 of the Covenant on Economic, Social, and Cultural Rights. However, the study points out a prevalent misconception among employers that "affirmative action" or special protections are limited to rights such as maternity leave, menstruation leave, and abortion.

The review identifies critical elements essential for the implementation of OSHMS in MSMEs. These elements are categorized into three groups: downstream factors (including OSH training, commitment, risk management, and communication), middle stream factors (such as third-party support), and upstream factors (highlighting the role of government).

Gender gap in occupational health and safety management positions, indicating that despite progress in gender equality, women remain underrepresented in leadership roles within this sector. This disparity is attributed to systemic barriers and societal gender biases that limit women's participation and advancement in traditionally male-dominated fields.

Organizations can improve work performance by fostering a safe, supportive, and inclusive work environment that addresses the specific challenges faced by women in the industry and ultimately optimizes their contribution to organizational success.

Conclusion

The basic objectives of the paper were to explain the research situation on occupational health & safety with reference to women. The review highlights the different methodologies and observations to health and safety for women at workplace. Most of the studies found to be using cross sectional data and correlation approach to examine relation between the different variables related for the study. But all the studies agree that women required a separate strategy for reducing health and safety risk at workplace. The review also brought up the concept of safety climate index (SCI) and logistic regression in studies on occupational health and safety.

In a nutshell, the fight for a gender-sensitive approach to occupational safety and health benefits all those involved in the fight for decent work. By prioritizing these issues, organizations can foster a safe, supportive, and inclusive work environment that not only enhances the well-being of female employees but also optimizes their contributions to organizational success.

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The Impact of Instagram on Business Growth: A Comparative Study of Unorganized Entrepreneurs across Leading Social Media Platforms

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Abstract

This study compares Instagram with other popular social media platforms to examine the effect of Instagram on the expansion of unorganized entrepreneurs' businesses in Kerala. The study uses a sample of 100 entrepreneurs that is equally split between Instagram users and users of Facebook and Twitter. It uses quantitative and qualitative methods to evaluate the ways in which these platforms affect consumer engagement, marketing effectiveness, and business performance. Results show that Instagram has a lot to offer in terms of cost-effective marketing and customer relationship building, but there are drawbacks as well, like time consumption. It is evident from the hypothesis testing that Instagram differs significantly from other platforms in terms of business development. This suggests that although Instagram offers many advantages, more research is necessary to determine its relative efficacy. The report gives insightful information on how social media contributes to the expansion of entrepreneurship and offers helpful advice for entrepreneurs.

Keywords: Instagram, Social Media Platforms Unorganized Entrepreneurs, Business Growth.

Introduction

Instagram, a photo-sharing app with over a billion monthly active users, has become a powerful marketing tool for businesses of all sizes. It allows businesses to engage with their audience, build brand awareness, and drive sales. This section explores how Instagram contributes to business growth and strategies for maximizing their presence on the platform.

Business Growth through Instagram

Instagram, a photo-sharing app with over a billion monthly active users, has become a powerful marketing tool for businesses of all sizes. It allows businesses to engage with their audience, build brand awareness, and drive sales. This section explores how Instagram contributes to business growth and strategies for maximizing their presence on the platform.

Here are few key points how Instagram facilitates business:

Building Brand Awareness

- Visual Storytelling
- Consistent Branding
- User-Generated Content

Customer Engagement

- Interactive Features
- Influencer Collaborations
- Direct Communication

Driving Sales

- Shoppable Posts
- Instagram Ads
- Promotions and Discounts

Analytics and Insights

- Instagram Insights
- Tracking ROI

Instagram offers significant business growth opportunities through its visual platform, interactive features, and robust advertising options. By utilizing Instagram's tools and staying updated with audience preferences, businesses can enhance their brand presence, engage with customers, and drive sales. Staying competitive in the digital marketplace is crucial.

Concept of Unorganized Entrepreneurs

Unorganized entrepreneurs refer to individuals who engage in entrepreneurial activities without adhering to formal organizational structures or traditional business frameworks. These entrepreneurs often operate independently, leveraging digital platforms like social media to market their products or services and interact directly with customers.

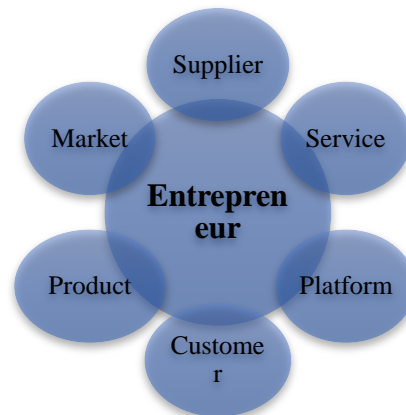


Figure 2: Unorganized entrepreneurs

Traditional businesses lack a registered entity, formal office space, or structured plan, relying on digital tools, personal networks, and online platforms for activities, transactions, and promotion. This flexibility enables quick market entry, adaptability to trends, and smaller scale operations.

Key characteristics of unorganized entrepreneurs include:

- Independent Operation
- Digital Entrepreneurship
- Flexibility and Agility
- Limited Scale
- Entrepreneurial Spirit

Unorganized entrepreneurs exemplify a modern form of entrepreneurship enabled by digital technologies, focusing on agility, innovation, and leveraging online platforms to establish and grow their businesses.

Objectives of the Study

- To compare the influence of Instagram and other social media platforms on business development for unorganized entrepreneurs in Kerala.
- To analyze the impact of these platforms on business performance and growth in Kerala.
- To explore the effectiveness of social media marketing in Kerala for today's business.
- To identify the unique advantages and disadvantages of Instagram marketing in Kerala compared to other platforms.

Hypothesis of the study

H0 (Null Hypothesis): There is no significant difference in the impact of Instagram compared to other social media platforms on the overall business development of unorganized entrepreneurs in Kerala.

H1 (Alternative Hypothesis): Instagram has a significantly different impact on the overall business development of unorganized entrepreneurs in Kerala compared to other social media platforms.

LITERATURE REVIEW

Abbasi, T. M. (2020) The study investigates how Harris Tweed independent company owners in the Outer Hebrides feel about using social media to promote their brands. The entrepreneurs thought that there would be no business without social media, having moved to the Outer Hebrides in search of prospects and a more laid-back way of life. The two main variables affecting its adoption were found to be motivation and expectation factors. The study discovered that social media's effective and affordable qualities, which facilitate their entry into foreign markets, are the reasons why business owners still utilize it.

Abdalqadir, K. K. (2023) Specifically, the objective of this research is to assess the degree to which small and medium-sized enterprises in the Kurdistan area of Iraq have utilized social media. The findings of a survey indicate

that individuals are content with platforms since they have reduced the amount of money they spend on marketing, improved the quality of their contacts with customers, and increased the amount of money they make from sales. A number of different cities ought to be taken into consideration via ongoing research.

Alafranji, S. W. (2021) This study's objective is to investigate the gendered features of Palestinian women's use of social media to create private companies in the Gaza Strip, which is a region that is occupied by the Israeli occupation. Specifically, the study will focus on the Gaza Strip. This study focuses on the challenges that Palestinian women face, including evolving societal expectations, the blockade imposed by the Israeli occupation, and the unusual use of social media platforms to provide for their family. Specifically, the study examines these challenges.

Ayorinde, I. (2023) The purpose of this study is to analyze the influence that digital marketing has had on the profitability and performance of small and medium-sized enterprises (SMEs) after the implementation of COVID. AOY Group is able to get indirect benefits from digital marketing strategies employed by major firms such as Uber, Bolt, and Yango, according to the findings of a study that utilized qualitative research methods and in-depth interviews. A number of areas, including lifestyle, were found to have been negatively influenced by COVID-19, according to the findings of the study; nonetheless, there has been ongoing improvement in the sector.

Bukhari, S. S., & Gupta, M. (2021) The research is being conducted with the intention of offering a marketing solution to merchants of clothes in Jammu, Jammu and Kashmir. Social media was found to be an efficient marketing technique for contacting customers, according to data collected from 21 different stores. According to the findings of the study, those who do not currently make use of social media should consider doing so because of its cost-effectiveness, larger reach, user-friendliness, and customer feedback. Small-scale Indian retailers are the target audience for this research, which intends to assist them in expanding their client base, profit margins, and global visibility.

Chatterjee, S., & Banerjee, K. (2023) In today's digital era, social media platforms are crucial for business promotion and marketing. They allow mass audiences to engage with businesses, promoting goods, services, or ideas. Social media also benefits consumers by providing access to diverse markets and fostering relationships with clients. It can elevate businesses by attracting customers and building customer loyalty. This research examines the impact of social networks on women's entrepreneurship, particularly in food and handloom businesses. Results show Facebook is the most preferred platform for women entrepreneurs, but challenges such as negative comments and cyberbullying persist.

Handa, J. O. S. H. N. A. (2020) Fashion Design, renowned for its creativity and innovation in clothing, accessories, and footwear, has evolved with the advent of information technology, digitalization, social media, and business skills. Designers now focus on creating products tailored to target customers, utilizing digitalization, information technology, and social media tools to achieve customer delight. This study highlights the importance of these collaborations in the fashion industry.

Methodology

Research Design

This study examines the impact of social media platforms, particularly Instagram, on the growth and operations of unorganized entrepreneurs in Kerala, India. It uses a descriptive and analytical approach to evaluate how these platforms influence marketing strategies, consumer engagement, product promotion, and business expansion. The research aims to provide a comprehensive understanding of the varying roles and effectiveness of social media platforms in the entrepreneurial endeavors of entrepreneurs in the region.

Research Area

This research investigates the influence that Instagram and other well-known social media platforms have had on the growth of businesses run by unorganized internet entrepreneurs, with a particular emphasis on those entrepreneurs based in Kerala, India.

Sample Size

The sample size for this study comprises 100 unorganized entrepreneurs from Kerala, India. This includes 50 individuals who actively use Instagram for their business activities and 50 individuals who utilize other social media platforms such as Facebook, Twitter, or Instagram. This balanced sample allows for a comparative analysis of the impact and effectiveness of Instagram relative to other platforms. The selection of a sample size of 100 aims to provide sufficient data to draw meaningful conclusions while maintaining manageability in data collection and analysis.

Research Population

The research population for this study consists of unorganized entrepreneurs operating businesses in Kerala, India, who actively use social media platforms for marketing and business growth. Specifically, the study focuses on individuals who engage in entrepreneurial activities without formal organizational structures or extensive business frameworks. These entrepreneurs leverage platforms like Instagram, along with other well-known social media platforms, to promote and sell products or services.

Sampling Technique

Convenient sampling is a non-probability sampling technique used in qualitative research and exploratory studies. It involves selecting individuals or cases based on their easy availability and accessibility, rather than random or structured methods. In this study on the impact of social media platforms like Instagram on unorganized entrepreneurs in Kerala, India, convenient sampling allows for quick and efficient data collection from active social media users. However, it may introduce bias by excluding less accessible or different experiences or perspectives. Researchers must acknowledge and mitigate potential biases to ensure the reliability and validity of their findings.

Source of Data

Both primary and secondary data were collected through the use of surveys, reference books, internet sources, brochures, and corporate profiles of various companies.

Data Collection Methods

This study used both primary and secondary data collection methods to gather comprehensive data on business activities, marketing strategies, product categories, and growth metrics. Primary data was collected through surveys distributed to 100 unorganized entrepreneurs in Kerala, India, with an equal split between Instagram and other social media platforms. Secondary data was sourced from literature reviews, reference books, internet sources, brochures, and corporate profiles of various companies, providing a well-rounded dataset for analysis.

Data Analysis Techniques

The study used both quantitative and qualitative analysis techniques to analyze data from surveys. Quantitative data was analyzed to identify patterns, trends, and correlations, while descriptive statistics were used to summarize the data. Comparative analysis was performed to understand the impact of Instagram users versus other social media platforms on the growth of unorganized entrepreneurs in Kerala. A t-test was conducted to compare the means of business development between Instagram users and users of other platforms.

Comparative Analysis

Core Products or Services

The data suggests that among the entrepreneurs who were polled, the products that are most popular on Instagram and other platforms are clothing and craft items. The percentages of these products are comparable across all types of platforms. This indicates that there is a preference for these categories that is consistent independent of the social media platform that is being utilized.

Table 1: Core Products or Services

Product	No. of Respondents (Instagram)	Percentage (Instagram)	No. of Respondents (Other Platforms)	Percentage (Other Platforms)	Total
Craft Item	14	28%	13	26%	27
Garments	13	26%	12	24%	25
Food Items	11	22%	10	20%	21
Cosmetics	3	6%	2	4%	5
Others	9	18%	13	26%	22
Total	50	100%	50	100%	100

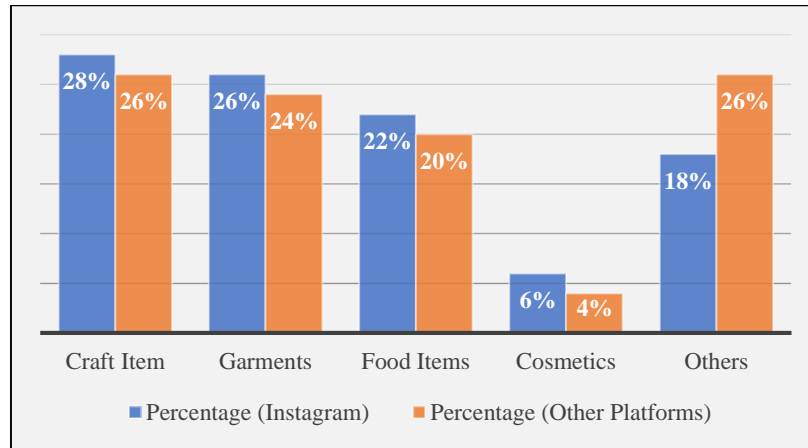


Figure 3: Graphical Presentation of Core Products or Services

It is interesting to note that although Instagram users have a minor advantage in the "Others" category, which describes a wide variety of products, other platforms have a higher percentage of users who are interested in cosmetics. This variability is a reflection of the fact that different entrepreneurs have different market strategies and product objectives.

Source of Initial Idea for the Business

With nearly 38 percent of entrepreneurs drawing inspiration from social media networks, the data demonstrates that social media plays a significant role as a source of business ideas for entrepreneurs on Instagram as well as other platforms. Additionally, friends and family have a substantial impact on the ideas that are generated by entrepreneurs, demonstrating a balanced dependence across platforms.

Table 2: Source of Initial Idea for the Business

Source	No. of Respondents (Instagram)	Percentage (Instagram)	No. of Respondents (Other Platforms)	Percentage (Other Platforms)	Total
Social media	19	38%	19	38%	38
Friends & Family	16	32%	15	30%	31
Self	15	30%	16	32%	31
Total	50	100%	50	100%	100

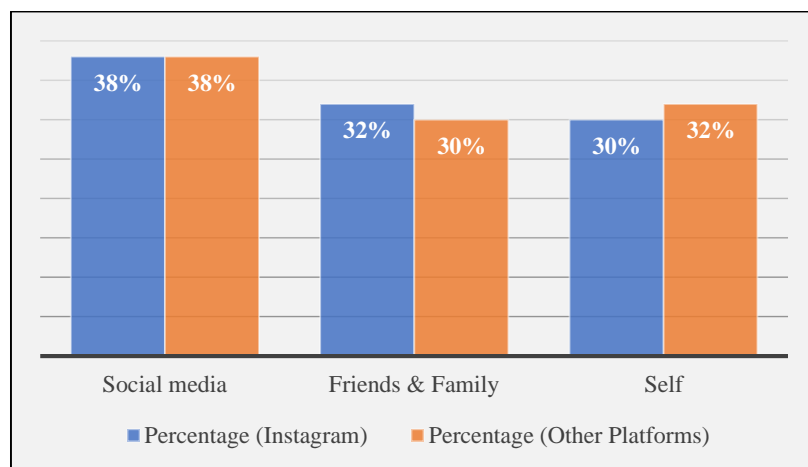


Figure 4: Graphical Presentation of Source of Initial Idea for the Business

Taking into consideration the current digital landscape, the findings highlight the significance of social connections and online platforms in the process of structuring Netpreneurial operations.

Instagram's Benefits on Business

Instagram appears as a powerful tool for creating consumer relationships, with 44% of respondents noting its usefulness. This gives Instagram a minor advantage over other platforms compared to other platforms in this regard. Even if the variations between the two groups are quite minor, both groups accept the importance of Instagram as a cost-effective marketing tool.

Table 3: Instagram's Benefits on Business

Response	No. of Respondents (Instagram)	Percentage (Instagram)	No. of Respondents (Other Platforms)	Percentage (Other Platforms)	Total
Cost Effective Way of Marketing	15	30%	14	28%	29
Good for Business Promotion	13	26%	13	26%	26
Good for Building Relationship	22	44%	23	46%	45
Total	50	100%	50	100%	100

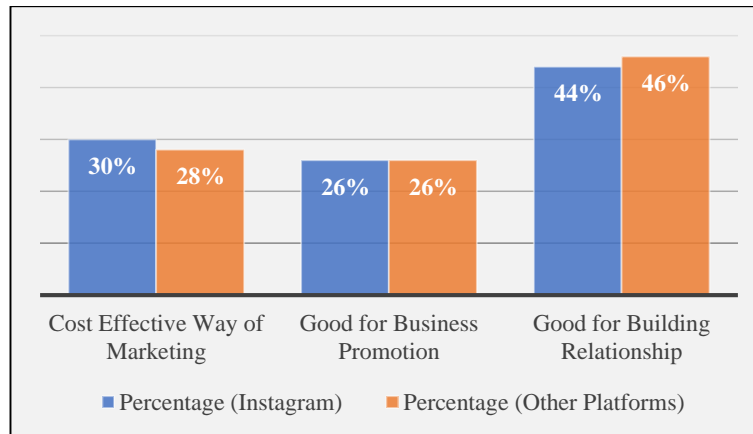


Figure 5: Graphical Presentation of Instagram's Benefits on Business

Consequently, this highlights the importance that Instagram plays in promoting direct connection with customers and increasing brand visibility, both of which are essential for the expansion and development of businesses.

Expansion Plans

When compared to users of other platforms, Instagram users have a 40% greater propensity to introduce new products. This indicates that Instagram users are more likely to engage in expansion initiatives. This proactive strategy indicates that Instagram-based entrepreneurs are prepared to broaden their product offers and investigate new market sectors.

Table 4: Expansion Plans

Response	No. of Respondents (Instagram)	Percentage (Instagram)	No. of Respondents (Other Platforms)	Percentage (Other Platforms)	Total
Introduction	22	44%	22	44%	44
Tie up with other businesses	7	14%	7	14%	14
Retail business	11	22%	11	22%	22
Not willing to expand	10	20%	10	20%	20
Total	50	100%	50	100%	100

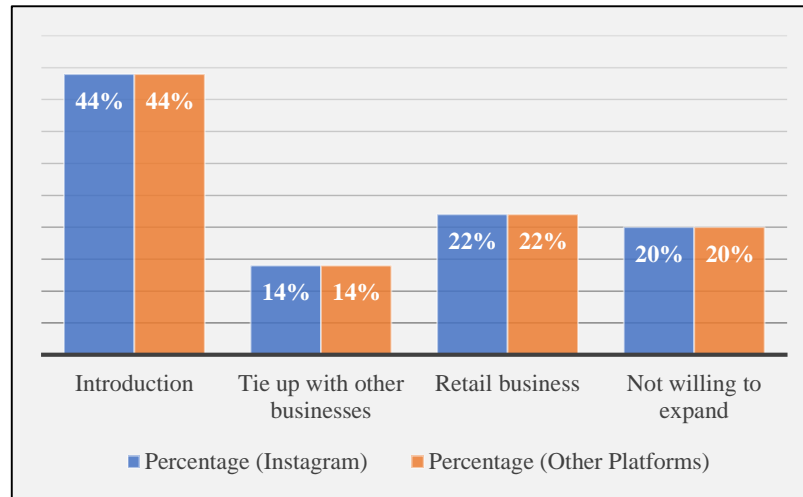


Figure 6: Graphical Presentation of Expansion Plans

In the meanwhile, the fact that the percentages of tie-ups with other businesses and retail activities are comparable demonstrates that both groups have a continuous growth strategy, albeit with varied degrees of aggressiveness.

Disadvantages of Instagram on Business

According to the statistics, a significant problem that has been brought to light is the perceived time consumption that is linked with marketing on Instagram. This concern was cited by fifty percent of Instagram users, whereas forty-eight percent of users on other platforms mentioned the same concern. This suggests that maintaining time-intensive social media techniques is a difficulty that is universally faced by entrepreneurs across the internet.

Table 5: Disadvantages of Instagram on Business

Response	No. of Respondents (Instagram)	Percentage (Instagram)	No. of Respondents (Other Platforms)	Percentage (Other Platforms)	Total
Time consumption	25	50%	24	48%	49
Users are allowed to post negative comments	16	32%	16	32%	32
Variation in profit margin	9	18%	10	20%	19
Total	50	100%	50	100%	100

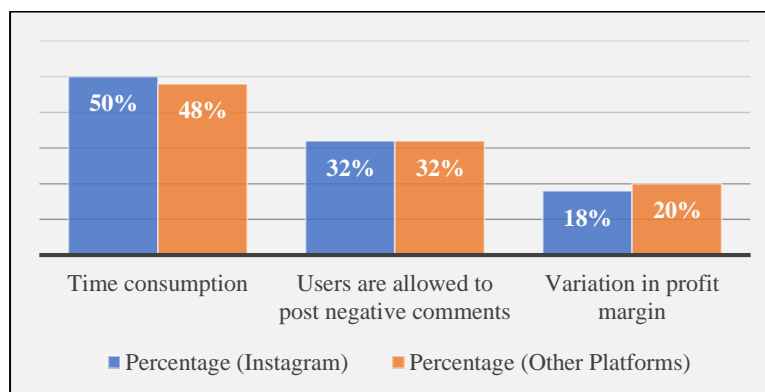


Figure 7: Graphical Presentation of Disadvantages of Instagram on Business

Additionally, the capability of users to make critical comments and variances in profit margins is regarded as important negatives, despite the fact that both user groups have similar impressions of these aspects.

Hypothesis Thesis

Table 6: Instagram vs. Other Social Media Platforms on Business Development of Unorganized Entrepreneurs in Kerala

	Group	N	Mean	S.D	t- value	Significant Value	Result
Business development of unorganized entrepreneurs	Instagram platforms	50	3.26	1.052	-1.69	0.03	Fail to Reject H0 Accept the H1
	Other social media platforms	50	3.66	0.995			
Total		100					

*Significant value: 0.05

According to the null hypothesis (H0), there is no discernible difference between Instagram's and other social media platforms' effects on business development. According to the alternative hypothesis (H1), Instagram's influence differs greatly from that of other sites. According to the data, entrepreneurs utilizing Instagram have an average business development score of 3.26 with a standard deviation of 1.052, and those using other social media platforms have an average score of 3.66 with a standard deviation of 0.995.

For this comparison, the computed t-value is -1.69, and the significance value (p-value) is 0.03. We would normally reject the null hypothesis because the significance value is less than the traditional threshold of 0.05, showing a substantial difference between the effects of Instagram and other social media sites. The result, however, reads "Fail to Reject H0," indicating that even if the p-value is less than 0.05, the interpretation might be conservative or there might be other factors or limitations influencing this choice.

The ultimate choice to "Fail to Reject H0" shows that additional research or contextual factors may have altered the interpretation of the data, even though the p-value indicates a statistically significant difference.

Conclusion

This study shows how important Instagram is to the unorganized entrepreneurs in Kerala's company growth. Instagram offers cost-effective marketing solutions and is especially good at building relationships with customers, but it also has drawbacks, like requiring a large time commitment. The comparison analysis shows that Instagram has a noticeable effect on business development, but the findings also imply that the advantages and disadvantages of the platform should be weighed against those of other social media resources. These results highlight the necessity for entrepreneurs to balance Instagram's shortcomings with its effective use of its advantages. Future studies could examine the subtleties of social media's influence on business success in greater detail to offer more specialized advice for entrepreneurs navigating the digital terrain.

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Sustainability Practices in Indian Oil and Gas EPC Firms: Evaluating Environmental, Social, and Economic Indicators

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Abstract

Purpose: This study assesses the adoption of GRI-11 Sustainability Indicators in the Indian oil and gas Engineering, Procurement & Construction (EPC) industries with reference to environmental, social, and economic indicators.

Design/methodology/approach: A comparative analysis was conducted based on sustainability reports of nine major oil and gas EPC companies. This study employs a scoring methodology based on the GRI-11 guidelines and evaluates companies across three key dimensions: economic, environmental, and social. The overall sustainability performance was in the range of 49 – 56; overall performance, environmental management, and social responsibility were higher in Aker Solution and Bechtel. However, Samsung and Worley were less impressive, with lower scores, specifically in the social area, which involved the consideration of labor and community aspects. Although there was a steady position of companies for overall operating conditions and economic importance, both environmental and social positions fluctuated slightly.

The findings of this study extend the existing knowledge about the state of sustainability reporting in the oil and gas sector by examining the practices of EPC firms operating in India. This highlights the aspects of development, particularly social responsibility and environmental management, and underlines the need to provide comprehensive and comparable information. This study covers only one year of sustainability reports, which means that it has limited capability to identify trends over time

Keywords: Sustainability, GRI, Reporting, Indicator, Economic, Environmental, Social, Oil and Gas, EPC Companies.

Data Access Statement: Research data supporting this publication are available from

<https://www.worley.com/en/sustainability>
<https://www.kbr.com/en/who-we-are/sustainability>
<https://www.akersolutions.com/sustainability/sustainability-reports/>
<https://www.bv.com/resources/2023-sustainability-report/>
<https://www.bechtel.com/about/annual-reports/>
<https://www.ten.com/en/media/document-library/sustainability-reports>
<https://www.samsung.com/global/sustainability/digital-library/sustainability-report/>
<https://www.tataproyects.com/sustainability/integrated-report/>
<https://www.lntsustainability.com/integrated-report/>
<https://www.globalreporting.org/>

Plain Language Summary

In this study, sustainability reporting practices in oil and gas EPC companies are measured using GRI-11 standards. These standards focus on three key areas: social, environmental or economic. To assess the performance of these areas, we collected sustainability reports of nine key companies and compared them among each other. The findings show that Aker Solution and Bechtel are more environmentally and socially sustainable than Samsung and Worley, but the latter of which has slightly lower social responsibility indices. It was revealed that there was more variability in the reporting on the environmental and social factors comparing to the reporting of the economic performance. This study identifies the need to enhance the practice and adoption of sustainability reporting and implementation; with more focus on the labour standards and relations to time response with the business and society by the Indian oil and gas EPC firms to therefore operate sustainably for the common good.

Introduction

The oil and gas sector is one of the most important contributors to the overall economic development and plays an essential role in energy security, employment generation, and industrialization (Wan A. et al., 2016). Sustainability reporting, which started in the 1990s, is much younger than mandatory financial reporting, which has roots in the Great Depression. However, it is now turning into a legal necessity rather than a choice, as more governments, stock exchanges, market regulators, investors, civil societies, and other stakeholders claim more elaborate information on the sustainability effects of organizations. Corporate governance is also essential for the fulfilment of sustainable development goals, as captured by insight number 12.6, which calls on member states of the United Nations (UN) Sustainable Development Goals (SDGs) to promote such practices within businesses, to undertake sustainable practices and provide sustainability information in their reporting. Sustainability reporting assumes the role of a critical factor for firms in conveying an indicator of their environmental, social, and

economic performance to stakeholders (Chopra S. et al., 2024). In the Indian oil and gas sector, sustainability reporting is not well practiced, and because of the variation in the dimensions of companies, it becomes quite difficult to establish a standard and certified reporting methodology that can clearly depict the safety culture and sustainability happenings in the organization (Pati 2023, Frank et al. 2016). Sustainability reporting frameworks offer business organization guidelines that can be used to identify, evaluate, and disclose sustainability themes and indicators, compare them with industry standards, and disseminate trends to stakeholders, including shareholders and consumers (Paridhi, & Ritika. et al, 2024). These are the Global Reporting Initiative (GRI), CDP, Sustainability Accounting Standards Board (SASB), and Task Force on Climate-related Financial Disclosures (TCFD). These goals also aid organizations in establishing sustainable goals for themselves with the help of the UN SDGs. A report by KPMG in 2020 noted that the GRI remained the most popular sustainability reporting standard in the world, where it was adopted by about 75% of the world's 250 largest companies (Threlfall et al., 2020).

The GRI is currently the most popular form of sustainability reporting, which assists organizations of all kinds from different industries in reporting sustainability impacts sustainably and comparably (Brown et al., 2009). GRI-11: Oil and Gas Sector Disclosures contain recommendations for companies in the oil and gas sector for the disclosure of topics such as emissions, energy, biodiversity, indigenous rights, and economic impact (GRI, 2021, Al Amin, et al., 2022). This framework is designed to increase organizational responsibility and longevity by suggesting a fuller and standardized disclosure. The process of applying GRI-11 sustainability indicators by oil and gas Engineering, Procurement and Construction (EPC) companies in India is a spectrum of issues. These are regulatory, operational, and cultural issues that represent the situation in India, where sustainability practices are often difficult to implement.

The purpose of this study is to analyze the application of GRI-11 sustainability indicators by oil and gas EPC companies, and the aspects of sustainability that have been addressed by companies. This study sought to evaluate the extent to which these companies implement the GRI-11 guidelines in their reporting systems (Sana et al., 2022). The key research questions guiding this study are as follows: How well are EPC companies implementing the GRI-11 sustainability indicators? It is pertinent to examine how these companies fared about the three components of the triple bottom line: environmental, social, and economic. Answering these questions, this research provides insight into the trends of sustainability reporting in contemporary Indian oil and gas EPC organizations and directions for improvement/success stories (Modi et al., 2017).

Literature Review

Evolution of Sustainability Reporting

In the last few decades, developments in sustainability reporting have changed significantly in terms of the areas covered, approaches used, and the effects felt (Li A. et al., 2021). Introduced as a means of addressing environmental issues, sustainability reporting has evolved into covering social issues and governance based on changes in regulations, stakeholder pressure, and the availability of technology. This transition suggests a movement from a system of 'best efforts' annual disclosures towards more rigorously defined structures of annual reporting that are more formal and often prescriptive to increase the levels of accountability of companies' operations. TNS, created in the 1990s by Dr. Karl-Henrik Robèrt, is a methodology of sustainability that outlines the requirements for sustainable human impact on the environment and provides guidance on how organizations may follow these requirements (Robèrt, K. H. 2002). The Triple Bottom Line (TBL) framework, created by John Elkington in 1994 – 1995, focuses on three key areas: physical surroundings, people, and the financial system. There is the "3Es concept," where the goal is economic, environmental, and social sustainability and the "3Ps model," where the primary objectives are people, planet, and profit. This framework assists organizations in their thinking of sustainable business practices. Sustainability reporting was initially environmental reporting in the 1990s and later turned into Corporate Social Responsibility (CSR) reports in the early 2000s and broader sustainability reports by 2010. This shift demonstrates an increasing understanding of the relationship between environmental, social, and economic problems (Weder 2023). Over time, the overall themes of sustainability reports have shifted, and, more recently, there has been an emphasis on linking sustainability reports to the United Nations Sustainable Development Goals (SDGs) (Li & Rockinger 2024).

The UN SDGs outline the global objectives for prosperity and environmental conservation, including GRI, CDP, ISO 14001, B-Corporation Certification, SASB, TCFD, Integrated Reporting, and LEED, which assist organizations in issues such as transparency, resource management, ethical conduct, climate change risk reporting, and building design sustainability.

Role of Global Reporting Initiative (GRI) in Sustainability Reporting

Therefore, the GRI has a fundamental function in the governance of sustainability reporting by offering a structure that organizations use globally to report their environmental, social, and economic impacts (Massari, G. et al, 2023). GRI-11 standards offer a clear framework that can be followed by the oil and gas sector when presenting sustainability and performance data (Abeysekera, I. (202). This global reporting initiative standards seek to improve the transparency of companies and their ability to report on specific facets to allow informed decision-making (Menéndez-Sánchez, J. et al, 2023). This standardization is essential to allow various stakeholders to compare the level of sustainability practices within various organizations (Pandian et al., 2024). Through participation in global intentions, such as the SDGs, GRI-11 standards enable organizations to ensure that their claims help explain other large concepts of sustainable development and improve their credibility with stakeholders to ensure that decisions made ensure that they are aligned with sustainable development goals. (Molnár et al., 2024). Nevertheless, the scalability and increasing complexity of the GRI-11 standards have become a challenge for transparency. Compliance with GRI standards is influenced by institutional factors, organizational size, and external audits (Sarrakh, R., et al, 2022) (Friske et al., 2023). The GRI's impact is truly international, with a particular emphasis on the growing intent of the European Union to harmonize GRI-11 standards with local legislation. Such geographical diversification is indicative of GRI's influence on global sustainability reporting practices (Alexenko 2024).

Assessing Research Needs in Oil and Gas Sector Sustainability Reporting

Indian oil and gas sector organizations use sustainability reports and fail in systematic reporting, especially in safety culture reports; hence, the use of these reports will not allow an organization to confidently portray its safety performance (Pati 2023). A study on some Brazilian oil companies reveals that the use of GRI guidelines is also partial; it only means that sustainability reports are as much instrument of image-building as truth-telling about sustainability reporting is missing (Gaudencio et al. 2020). Little research is available focusing on the ability to formulate clear approaches that support the engagement of the concepts of economic, environmental, and social sustainability in the sphere of the oil and gas industry but disregards valuable context-specific conditions (Ahmad et al. 2017). Thus, the present environmental sustainability indicators do not capture all specific features of the oil and gas industry (Kaupke & Knyphausen-Aufseß 2023). A study of sustainability performance indicators of construction projects found that no specific KPIs were identified during the execution phase, which is essential for EPC companies, especially in the Oil and Gas sector (Rajabi et al. 2022) (Aljanadi, et al. 2023). The case of the scores used in Indian firms reveals that while some indicators are vital to sustainability performance, others, especially in governance structures, require further attention and innovation (Rajesh 2020).

Methods and Methodology

The data for this study were mainly collected from secondary sources; therefore, the research relied heavily on the sustainability reports of the selected Indian oil and gas EPC companies. Information was collected through the annual sustainability reports of the companies to obtain a holistic idea of sustainability management in the selected industry. This study aims to assess sustainability reports from the perspective of the GRI-11 framework that applies to the oil and gas industry. These guidelines provide a structured framework for measuring sustainability across three key dimensions. The major categories people identify are environmental, social, and economic. Thus, this study aimed to determine the level of compliance of Indian oil and gas EPC companies with internationally accepted sustainability reporting standards, as provided by the GRI-11 standards. Nine oil and gas EPC companies were selected based on their market size and ability to disclose information related to sustainability. This selection criterion facilitated the study to correctly compare various reporting practices to determine the industry's prevalent trends and issues. Survey data were obtained by gathering sustainability reports for the year 2023. Information from the listed companies was gathered from the company's website. This approach ensured that the incorporated data were sufficient to reflect current sustainability practices. For the assessment of sustainability reports, a quantitative approach was adopted using numerical scores. This entailed rating the performance of the organization along the 22 indicators contained in the GRI-11 guidelines on a scale of 0 to 3. This study assigns scores to the reports considering the analysis data depending on the information and its quality reported, where higher scores indicate higher-quality reporting (Al Amin, et al., 2022). This approach allowed for the evaluation of different organizations' stewardship based on sustainability reporting and GRI-11. In this study, the companies' scores were compared, and the results showed that this study has highlighted the positive and negative aspects of the sustainability reporting of the Indian oil and gas EPC sector. This approach not only reveals the status of sustainability practices but also the factors that organizations encounter in the implementation of GRI standards. This study seeks to understand the state of sustainability reporting in the oil and gas EPC industry in India and offers insights to stakeholders interested in further developing these reports.

Reasons for Selecting these Companies

The criteria used to select Indian oil and gas EPC companies for this study on sustainability reporting are based on different criteria. Some of the firms considered in the selection are Larsen and Toubro, Technip Energy, Tata Projects, Aker Solutions, Worley India, Samsung Engineering, KBR India, Black and Veatch, and Bechtel. These firms are EPC firms are deeply engaged in the oil and gas industry and contribute significantly to the development of India and the economy. Because of their large market share and economic contribution in India, these firms are suitable for evaluating sustainability practices in the Indian oil and gas EPC industry. Companies were selected because they have an annual turnover of over 10,000 crores and directly or indirectly employ more than 5,000 people in different projects in the country and internationally. These criteria helped to maintain relevance in the case of field selection and excluded companies that were not characterized by a high level of influence on the economy, society, and environment in their sustainability practices. These companies were chosen because they prepared their sustainability reports according to GRI-11 reporting standards for the oil and gas industry. Some companies were omitted from the analysis because they prepared sustainability reports that did not meet the GRI standards or because there were no sustainability reports available for such companies. To reduce redundancy, certain EPC companies with less extensive reporting methodologies are excluded to reduce redundancy. Furthermore, firms with exclusive specialization in sectors other than the oil and gas industry, including those established solely for developing renewable energy sources, were also omitted because the research was confined to the oil and gas industry. Applying the above criteria, this study was able to conduct a sound and general investigation of sustainability reporting practices among major actors in the Indian oil and gas EPC sector.

Numerical Pointing Method of Sustainability Reports for Indian Oil and Gas EPC Companies

The Numerical Pointing Method applied in this study is a systematic approach for assessing the sustainability reports of Indian oil and gas EPC companies based on the GRI-11 framework (Al Amin, et al., 2022). This method focuses on assessing companies' sustainability performance across three key dimensions – environmental, social, and economic. As depicted in Table-1, the 22 sustainability performance indicators used with reference to the GRI-11 guidelines, which are suitable for the oil and gas industries.

Table 1: Set of Indicator

Dimensions	Indicator	Code for Indicator
Environmental	GHG Emissions	GRI_ENV_A
	Climate adaptation, resilience, and transition	GRI_ENV_B
	Air emissions	GRI_ENV_C
	Biodiversity	GRI_ENV_D
	Waste	GRI_ENV_E
	Water and effluents	GRI_ENV_F
	Closure and rehabilitation	GRI_ENV_G
Social	Asset integrity and critical incident management	GRI_SOC_A
	Occupational health and safety	GRI_SOC_B
	Non-discrimination and equal opportunity	GRI_SOC_C
	Forced labor and modern slavery	GRI_SOC_D
	Freedom of association and collective bargaining	GRI_SOC_E
	Local communities	GRI_SOC_F
	Land and resource rights	GRI_SOC_G
	Rights of indigenous peoples	GRI_SOC_H
	Conflict and security	GRI_SOC_I
	Anti-competitive behavior	GRI_SOC_J
	Anti-corruption	GRI_SOC_K
Economic	Public policy	GRI_SOC_L
	Employment practices	GRI_SOC_M
	Economic impacts	GRI_ECO_A
	Payments to governments	GRI_ECO_B

These indicators allow for a comprehensive evaluation of companies' efforts across all the three sustainability dimensions. Each of the 22 indicators was assigned a score ranging from 0 to 3, as described in Table-2 below, based on the company's level of adherence to the GRI 11 guidelines:

Table 2. Numerical pointing method of Indicators

Sr. No.	Details	Rank	Score (0-3)
1	No disclosure or minimal effort in that area.	Poor	0
2	Limited disclosure with some evidence of effort.	Fair	1
3	Adequate disclosure meeting basic requirements.	Good	2
4	Comprehensive disclosure with best practices.	Excellent	3

The maximum score for each report was 66 points, as there were 22 indicators in the study, and each indicator could be assigned up to three points. This scoring system can assist in identifying how likely it is that a company has achieved sustainability over others and assists stakeholders in having an easy way to evaluate their company's performance. The Numerical Pointing Method offers an effective and simple method to evaluate and rank the sustainability performance of Indian oil and gas EPC companies. The sustainability scorecard assesses a firm's sustainability and ranks it as excellent, good, fair, or poor. Through this approach, companies can determine where they have gaps and where they are strong, and therefore work towards improving the effectiveness and efficiency of their operations in the sustainability framework.

Findings of the study and Discussion

A comparison of the sustainability practices of nine leading organizations and the economic, environmental, and social impacts related to them showed that the overall approach of the organizations to sustainability was different. A higher percentage range indicates less conformity with sustainability reporting, meaning a lower standard for sustainability reporting, whereas a lower percentage range represents consensus in reporting. Therefore, the main objective of this study was to evaluate the extent of compliance with the GRI-11 Sustainability Indicators of Indian Oil and Gas EPC organizations. As shown in Table-3 below, the analyses showed that companies such as Aker Solution and Bechtel provided a high level of overall and specific sustainability compliance with different sustainability indicators, especially in economic and social aspects, and shared broad information on essential practices in sustainability. Companies such as Worley and Samsung had higher variability, where Worley faced issues with reporting on its social impact and Samsung had issues reported on the environmental side with GHG emissions and waste management. Overall, some firms demonstrate excellent examples of sustainability reporting and meet all GRI-11 requirements, whereas others should improve their disclosure completeness and coherence

Table 3: Sustainability reporting scores of various companies

Name of Companies	Dimensions			Total Score	Range of score
	Economic indicators	Environmental indicators	Social indicators		
Aker Solution	5	19	32	56	15.15%
Black & Veatch	6	16	29	51	22.73%
Bechtel	5	18	32	55	16.67%
Technip	5	17	30	52	21.21%
KBR	5	17	30	52	21.21%
Samsung	5	17	27	49	25.76%
TATA Projects	5	18	32	55	16.67%
Worley	4	18	27	49	25.76%
L&T	5	17	31	53	19.70%

The overall sustainability report score was between 49 and 56, as depicted in Fig 1, thus categorizing it as moderate in its range of performance. Among all the companies, Aker Solution topped the list with a score of 56 and a balance scorecard, followed closely by Bechtel with a score of 55, which shows a balanced companies tailored to excel in every aspect, especially the social responsibility of the company to foster sustainable growth.

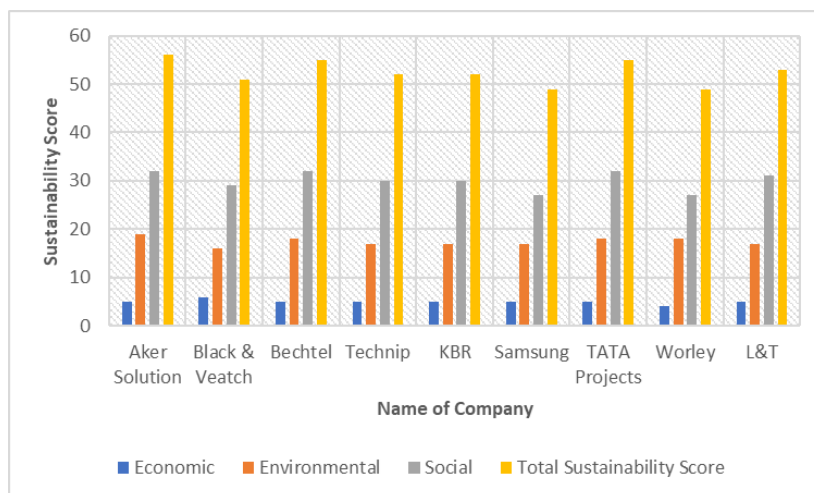


Fig 1: Overall sustainability score comparison

Samsung and Worley were at the lower end of the scale, indicating the need for change, especially in the social aspect, which showed the company's relatively weaker performance. The scores for the economic indicators are quite balanced; most firms are in the range of 5-6. The clear leaders are Black and Veatch, with six points for steady economic revenue and more significant transparency in their financing plans, whereas Worley only scored four, and the company evidently had some issues with demonstrated financial contributions, such as payments to government. Similar to social performance, environmental scores exhibit more fluctuation, with scores ranging between 16 and 19, with Aker Solution having the best score of 19 for disposing emissions and waste management. It can be observed that social indicators have the most fluctuation range, while the other indices represent the Aker Solution as the most responsible company. Bechtel and TATA Projects are less responsible, especially in labor rights and worker safety, scoring 32 compared to 27 for Samsung and Worley. Fluctuations in companies suggest the need for better assessment and integration of sustainable management practices among companies. Although consistency is clearly demonstrated through the cases of the Aker Solution, Bechtel, and Tata Projects, there remains potential for improvement in social and environmental sustainability for companies such as Samsung and Worley. As illustrated by the scores presented in the table 3, there is potential for enhancing sustainability performance, and for carefully balancing their practices across all three dimensions. Balancing economic, environmental, and social indicators is crucial for companies to improve their sustainability performance and meet global sustainability targets.

Reporting on Environmental Indicators

The analysis of the evaluated companies on environmental sustainability reporting indicates the level of compliance with the key GRI 11 indicators including greenhouse gas emissions, climate protection, air emissions, biodiversity, waste management, water and effluents, and closure and rehabilitation. After analyzing Table 4 below, all companies had a good record concerning the reporting of GHG emissions, with all the companies scoring a maximum of three, meaning that the companies are serious in cutting down on emissions and supporting climate change targets. Similarly, most companies fared well in terms of climate adaptation and resilience, although Black and Veatch had slightly lower scores, indicating moderate activity. However, the variation is evident in air emission reporting, where players such as Aker Solutions and Samsung are excellent in reporting, whereas Bechtel and Technip, for example, need improvements in how to control and report air pollutants.

Table 4: Environmental Indicators reporting scores of various companies

Environmental indicators	Name of Company								
	Aker Solution	Black & Veatch	Bechtel	Technip	KBR	Samsung	TATA Projects	Worely	L&T
GHG Emissions	3	3	3	3	3	3	3	3	3
Climate adaptation, resilience, and	3	2	3	3	3	3	3	3	3
Air emissions	3	3	2	2	2	3	2	2	2
Biodiversity	2	2	2	2	2	2	2	3	2
Waste	3	2	3	3	3	3	3	3	3
Water and effluents	3	3	3	3	3	3	3	3	3
Closure and rehabilitation	2	1	2	1	1	0	2	1	1
Total Score	19	16	18	17	17	17	18	18	17
Range of score	9.52%	23.81%	14.29%	19.05%	19.05%	19.05%	14.29%	14.29%	19.05%

Biodiversity management is a major issue for most companies, with Worley being the only company with a score of three, meaning that it has made a good effort in the conservation of ecosystems, whereas the other companies have a score of two, meaning that they have not done adequate work in the conservation of ecosystems. Waste management was another area where most of the companies performed well, with a few companies scoring a maximum score of three, but Black and Veatch scored lower in this area, implying that there are still areas where some of the companies need to improve in terms of waste reduction and recycling. All companies complied with water and effluent management, with an average score of three for water conservation and effluent treatment. However, there are concerns regarding the aspects of closure and rehabilitation. The scores range from 0 to 2, which indicates that there are major deficiencies, especially with Samsung, which has a score of 0 for the site rehabilitation of operations. The total environmental scores varied between 16 and 19, with the highest score of 19 given to the Aker Solution, which shows that they have good and stable environmental management in all aspects. On the other hand, Black and Veatch received the lowest score of 16 on the checklist, indicating their weaknesses in areas such as waste management and climate change adaptation. Fig-2 below provides a graphical representation of the range of the scores and variability.

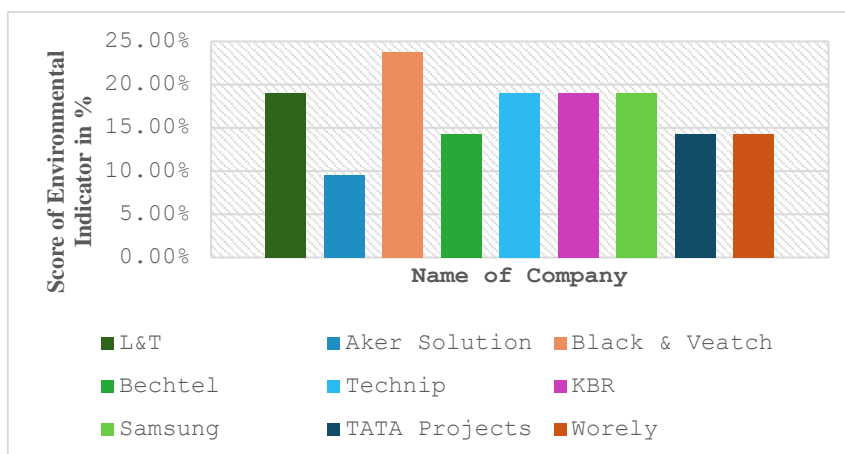


Fig 2: Environmental Indicators score variation

The scores ranged from 9 to 12, which could be attributed to the variation in the students' abilities and understanding of the concepts taught. Companies such as Aker Solution and Bechtel have more balanced and consistent reporting, followed by Black, Veatch, and Samsung, which have higher variability and need improvement in certain areas of the industry benchmark. In conclusion, this study suggests that there is a need to improve current environmental reporting and extend it to other areas that are not well reported but are crucial to the sustainability of the environment in the long run, such as the conservation of biological diversity and site rehabilitation.

Reporting on Economic Indicators

In this study, we evaluated companies' reporting practices using two key economic indicators: payments to the government and economic effects. The goal was to evaluate the extent of the organization's transparency and compliance with GRI-11 reporting standards, particularly the economic aspect, which is important for evaluating the roles of these firms in local and national economies. As shown in table-5 below, for economic impacts, the overall expected score was six, whereas the maximum possible score for Payments to Government was estimated to be two.

Table 5: Economic Indicators reporting scores of various companies

Economic Indicator	Name of Company								
	Aker Solution	Black & Veatch	Bechtel	Technip	KBR	Samsung	TATA Projects	Worely	L&T
Payments to governments	2	3	2	2	2	2	2	1	2
Economic impacts	3	3	3	3	3	3	3	3	3
Total Score	5	6	5	5	5	5	5	4	5
Range of score	16.67%	0.00%	16.67%	16.67%	16.67%	16.67%	16.67%	33.33%	16.67%

From this study, there is some inconsistency between firms in their disclosures of payments made to the government. Black and Veatch received the highest possible score of 3 because they made clear disclosures on the amount of financial payments offered to government agencies. This finding shows a high level of compliance with GRI-11 economic reporting standards. On the other hand, Worley scored the lowest with 1 in transparency concerning payments made to the government, and this is viewed as a company failing in the aspect of credibility of economic reporting. The other companies included Aker Solutions, Bechtel, Technip, KBR, Samsung, TATA Projects, and L&T, which obtained a score of 2 in this index, as they showed a moderate level of compliance, suggesting that companies need to improve more, especially at the level of disaggregation of financial statements.

As far as the economic impact indicator is concerned, all firms had a score of three because they were transparent with adequate information on their economic returns. This comprises the financial capital deposited in national and local economies, job creation, and structural development. The cohesiveness of the scores of this indicator suggests that firms in the oil and gas EPC segment have come to understand the relevance of the economic consequences of sustainability reporting and are gradually incorporating the same into their reports. The total of the two economic indicators was between 4 and 6. Among the participants, Black and Veatch secured a maximum of six, which endorsed their concerns for transparency and economic impact reports. On the other hand, Worley posted a low figure, registering a total of four, suggesting significant shortcomings in terms of economic reporting, particularly in payments to governments. The rest of the companies (Aker Solution, Bechtel, Technip, KBR, Samsung, TATA Projects, and L&T) scored 5, which also showed a moderate level of transparency, which means that the companies could do more to enhance efforts aimed at enhancing the quality of financial reports.

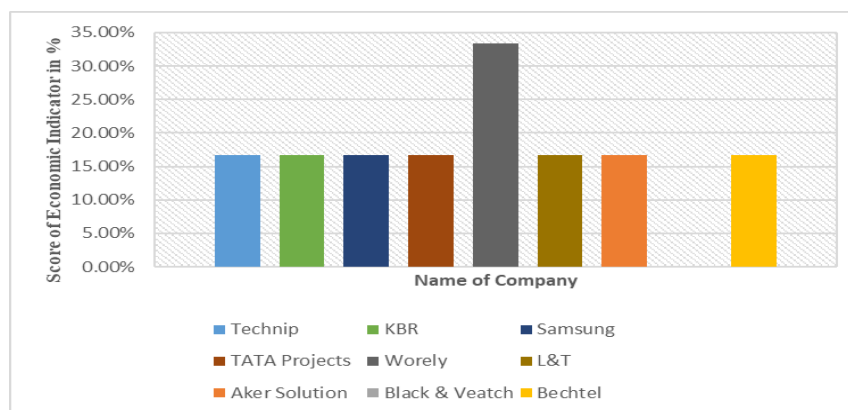


Fig 3: Economic Indicators score variation

The Range of Score column provides supplementary information on the degree of difference in reporting practices across firms, as depicted in Fig-3. Worley had the highest percentage range (33.33%) because it consisted of both a high degree of vertical differentiation and a high level of horizontal differentiation, 33.33%, which indicates that economic reports fluctuate significantly. Therefore, this high range suggests that, while Worley may only be

relatively satisfactory in its reports about the share of the economy it controls, its report on payments to the government is less uniform, which may be due to a lack of or inadequate disclosure in this area. However, Black and Veatch recorded zero fluctuations of 0%, which means that their reporting was similar for the two economic indicators. The remaining companies, including Aker Solution, Bechtel, Technip, KBR, Samsung, TATA Projects, and L&T, have a range of 16. 67%, meaning that it oscillated moderately, but was rather stable in the reporting practices of the two economic indicators. Most firms report a good extent of conformity to the GRI guidelines for economic reporting; however, the leaders here are Black and Veatch, which are the most transparent and consistent. The volatility ratio is very high in Worley's case, and this requires extra effort to enhance the level of transparency, particularly in relation to payments to governments that note disclosure. As most of these economic indicators are essential to prove that a company benefits society and is financially responsible, it is crucial to maintain stability and accuracy to gain stakeholder trust and ensure firm sustainability.

Reporting on Social Indicators

The analysis of social indicators for the companies in this study reveals a wide range of performance in areas such as labor practices, human rights, anti-corruption, and community engagement, as per the GRI-11 guidelines.

Table 6: Social Indicators reporting scores of various companies

Social indicators	Name of Company								
	Aker Solution	Black & Veatch	Bechtel	Technip	KBR	Samsung	TATA Projects	Worley	L&T
Employment practices	3	3	3	3	3	2	3	3	3
Public policy	2	2	2	2	2	3	2	2	2
Anti-corruption	3	3	3	3	3	3	3	2	3
Anti-competitive behavior	3	3	3	3	3	2	3	1	3
Conflict and security	2	1	2	1	1	0	2	1	1
Rights of indigenous peoples	1	1	1	1	1	2	1	2	1
Land and resource rights	2	1	2	1	1	0	2	1	2
Asset integrity and critical incident management	3	2	3	3	3	2	3	3	3
Occupational health and safety	3	3	3	3	3	3	3	3	3
Non-discrimination and equal opportunity	3	3	3	3	3	2	3	3	3
Forced labor and modern slavery	2	2	2	2	2	3	2	1	2
Freedom of association and collective bargaining	2	2	2	2	2	2	2	2	2
Local communities	3	3	3	3	3	3	3	3	3
Total Score	32	29	32	30	30	27	32	27	31
Range of score	17.95%	25.64%	17.95%	23.08%	23.08%	30.77%	17.95%	30.77%	20.51%

As represented in Table-6, for employment practices, the aggregated score of most firms, including the Aker Solution, Bechtel, and TATA projects, was good, with the highest score indicating 3, indicating that firms have decent labor standards and workforce management. Ultimately, there is an indication that Samsung could improve, represented by a score of 2, meaning that there can be changes where fair wages and employment are concerned. The degree of reporting on public policy was fair, considering that the mean was two, while the company got three, meaning that the company had a better relationship with public institutions. The scores for anti-corruption were high, with most of the companies indicating full compliance, while Worley score 2 showed poor anti-corruption compliance. Although higher variability was noted in the conflict, security, and rights of indigenous people, the scores of some firms, such as Samsung and Worley, were low, which indicated that they had poor practices in the management of conflicts and the engagement of indigenous people. The Aker Solution, Bechtel, and TATA Projects were in between these indices, which suggests that they have initiated changes in these areas but have not properly implemented the right practices. Altogether, all the companies operating in the business were effective in terms of occupational health and safety risks to the highest value of three, reflecting the concern of the organizations for the well-being of their employees. However, the ratings were different for the subcategories, where Black and Veatch scored 2 on asset integrity, which implies that the company has challenges in managing operational risks. In the non-discrimination and forced labor indicators, companies' performance was different, and Samsung and Worley were lower. Thus, it could be stated that these companies need to improve their diversity, inclusion policies, and forced labor risk management. The freedom of association scores was moderate, and their average was similar in all the companies, indicating that while the basic labor rights are respected more can be done to enhance the rights of the workers. Regarding general engagement with local communities, most firms scored equally well, indicating that they are more willing to support or invest in the communities from which they operate.

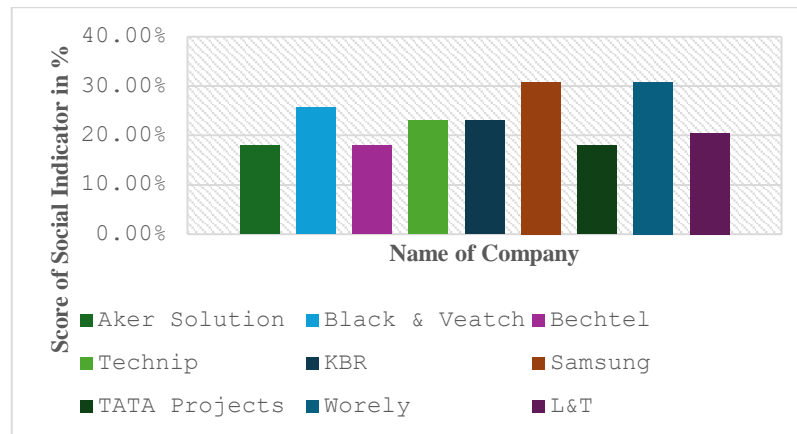


Fig 4: Social Indicators score variation

Thus, the received results showed that the three top-performing organizations were Aker Solution, Bechtel, and TATA Projects, scoring 32, which meant that these organizations had good reporting and complied with social sustainability policies. Samsung and Worley, which scored 27, had some of the following gaps: conflict management, forced labor, and indigenous people. The range of scores also captured variations in social performance, with Samsung and Worley having the highest scores of 30. Fig-4 provides information on the score range and variability. A similar percentage (30.77%) said that their companies have different approaches to the social responsibility of products, thus confirming our hypothesis. Among these, the Aker Solution, Bechtel, and TATA Projects presented a more standardized social sustainability performance with a narrower score range. Overall, the findings discussed in this paper indicate that most organizations know that social sustainability is important for their businesses; however, there are significant weaknesses in the standardized and systematic reporting of human rights and labor conditions, which should be implemented according to managing best practices to produce positive effects in the long term.

Conclusion

Sustainability reporting is a common feature in modern business environments and has several advantages at the global level. Sustainability reporting helps a company be marketed and branded as a responsible corporate citizen, which applies to environmental and social aspects. This study evaluates the sustainability reports of various Indian oil and gas EPC companies using a numerical evaluation system based on the GRI-11 norms. This system enabled the identification of the strengths and weaknesses of reporting practices and was built to improve companies' sustainability disclosures.

Companies such as the Aker Solution, Bechtel, and TATA Projects were found to provide excellent sustainability reporting concerning social and environmental contexts and most of the existing indicators. The same was especially observed with social aspects, such as conflict and the treatment of indigenous people, where some companies, such as Samsung and Worley, were observed to have some weaknesses in their reports. Overall, the level of economic reporting was similar for all firms; however, Black and Veatch were the most forthcoming. Similarly, Worley's performance was the lowest in this dimension. Almost all firms made reasonably good disclosures of environmental details such as GHG emissions and waste management, and some firms, such as Aker Solutions and Bechtel, were excellent.

The conclusions can be drawn from the fact that further environmental reporting is being encouraged since enterprises are appreciative of the fact that ecological economy and longevity are possible. This has been a plus in some ways that natural resources have been well-managed, leading to economic growth. However, there is still a huge potential for the development of the social aspect, which can be viewed as one of the weaknesses of companies in terms of labor practices and human rights. In supporting the notion that sustainability reporting must progress towards strategic reporting for the business, companies should ensure that they get at the very least the score to the minimum threshold on each of the dimensions according to GRI 11. This will not only help reduce the number of disadvantages closely related to environmental and social aspects but will also correspond to financial goals.

The findings of this study imply that organizations that pay attention to sustainability reporting have less negative environmental and social impacts, overall organizational operational effectiveness, and responsible use of resources. Following the common management adage that says, 'If you cannot measure it, you can change it,' sustainable reporting has emerged as an inherent part of managing a sustainable global economy. This provides

the basis for assessing long-term profitability through social justice and care of the natural environment. A special sustainability report indicates the company's interests and the entire society's concerns, and offers a reference source for everyone. This study confirms that the integration of sustainability reporting and responsibility practices positively affects companies and society.

Limitations

One limitation of this study is its focus on Indian companies, which makes the findings less applicable to other regions with different regulations and market conditions. Additionally, the scoring method is subjective and is based on a single year of data, which limits its ability to assess long-term trends. A multiyear analysis provides a more comprehensive view of sustainability.

Future Study and Direction

Future studies should analyze sustainability reporting over multiple years to track trends and improvements in practice. Expanding the scope to include other frameworks, such as SASB or TCFD, as well as gathering primary data from stakeholders, will offer a more comprehensive view of the real-world impacts. Additionally, comparative research across regions and sectors, along with exploring technologies, such as AI and blockchain, can enhance transparency and reporting accuracy in sustainability practices.

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Customer Satisfaction of Multimedia Marketing Channels In Personal Care Products

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Abstract

The rise of multimedia marketing has revolutionized the personal care product industry, making it imperative to understand customer satisfaction across various channels. This study aims to identify and evaluate the most preferred multimedia marketing channels for personal care products, the influencing factors driving purchases, consumer satisfaction concerning variables like engagement, purchase intention, and brand reputation. It classifies customers based on Net Promoter Score (NPS). The findings provide valuable insights for marketers, highlighting the importance of leveraging social media. The study statistical tools like Friedman test, Kruskal Wallis H test, and NPS to ensure robust and reliable findings

Keywords: Multimedia Marketing Channels, Engagement, Purchase Intention, Brand Reputation.

Introduction

Multimedia marketing is at the center of creative business tactics used in today's marketing environment, where the world of digital media is influencing every aspect of our lives. To effectively communicate with the target audiences, this transformative strategy combines a variety of media elements, including text, photos, videos, animations, and interactive material. Multimedia marketing methods are becoming more complicated and successful as technology advances. The significant influence of multimedia marketing in India can be attributed to the swift advancement of digital technology, increased internet accessibility, and the increasing prevalence of smartphones. India is a vibrant and diversified market that offers organizations using multimedia marketing tactics both special chances and challenges. This study explores the complex realm of multimedia marketing, concentrating on how it affects consumer perception in the personal care products sector.

The marketing landscape has gone through a transformation due to the rapid development of digital technologies in recent decades. Multimedia channels that are dynamic and interactive have replaced and in certain cases eliminated the traditional methods of approaching consumers. A new era of audience engagement for businesses has emerged as a result of the internet, social media, mobile devices, and advanced visual design tools coming together. As it navigates the difficulties of appealing to a varied and sophisticated consumer base, the personal care products market has emerged as a particularly interesting battleground within this paradigm change.

In the past, traditional advertising media including print, radio, and television played a major role in personal care industry promotions. But with the introduction of digital platforms, the consumer experience has changed, by providing a more engaging and interactive experience. Because multimedia marketing appeals to multiple senses at once, it offers personal care companies a special chance to engage more deeply with their target market. For firms to succeed in this competitive sector, it is critical to understand how customers will view multimedia marketing as they increasingly depend on Internet channels for product recommendations and pieces of information.

A change in perspective has occurred in the personal care products industry in recent years due to the shifting of consumer preferences and a greater focus on wellness and self-care. In this age of individual autonomy, consumers actively look for products that fit with their lifestyles, values, and personal accounts. Multimedia marketing is a powerful tool that personal care brands use to communicate not only the features of their products but also their core principles that connect with their target audience. It has an innovative effect on the personal care products industry, changing how companies interact with their target audience, raising brand awareness, and increasing revenue. As consumers are constantly exposed to a vast amount of multimedia content, personal care brands must understand how consumers view and interact with their advertising if they have to stand out in a highly competitive marketplace. In the personal care industry, multimedia marketing includes a broad variety of material, such as eye-catching commercials, engaging social media campaigns, influencer partnerships, and interactive online experiences. These components help to build a brand image that promotes consumer perception, preferences, and loyalty in addition to the product itself.

Multimedia integration is becoming crucial for personal care product marketing strategies as consumers depend more and more on digital channels for information and purchase. The need to interact with a variety of audiences, convey brand values, and present the advantages of the product attractively and educationally is what is driving this evolution.

Theoretical review

The literature on this topic spans various dimensions, from the psychological underpinnings of consumer behaviour to the technological aspects of digital marketing. Previous studies have explored the role of social media influencers in shaping consumer attitudes, and the effectiveness of targeted digital ads in driving sales. Wenya Zhang, Wei Zhang, and Tugrul U. Daim (2023) investigated customer purchase intention in online social media marketing: A case study on TikTok. According to the study's results, customer purchase intention strongly correlates with both utilitarian and subjective value. The relationship between perceived value and buy intention is mediated by emotional pleasure, and the relationships between perceived worth and emotional pleasure and between emotional pleasure and purchase intention are positively moderated by flow experience. The literature on buyer intentions and online social media marketing is expanded by this study. Man Lai Cheung, Guilherme Pires, Philip. Rosenberger. (2020) studied how consumer brand engagement and brand knowledge are affected by social media marketing components such as entertainment, customization, interaction, electronic word-of-mouth (EWOM), and trendiness. According to the findings, trendiness, electronic word-of-mouth, and interactivity are the main factors that directly affect consumer brand engagement, which in turn improves brand awareness and brand knowledge. This is in contrast to the non-significant findings on the impact of customization and entertainment on consumer engagement with brands. Hong Quin, Daniel Alan Peak, Victor Prybutok. (2020) extended a study that looks into how much users' opinions and purchasing habits might be influenced by mobile augmented reality (MAR) apps. It investigates user experience empirically and looks at how customer perceptions of accuracy, simplicity of use, and emotional and utilitarian fulfilment are affected. Results show that there is a substantial correlation between MAR app use and perceptions of satisfaction and usefulness. Customers tend to have a more favourable affective response when they think the MAR app featured entertaining, helpful, and aiding in the acquisition of information. Marta Oliveira and Teresa Fernandes (2020) researched social media engagement with luxury brands.

Most studies highlight the significant influence of social media marketing on consumer behaviour, including purchase intention, satisfaction (Noviani et al. (2022) impact (Manzoor et al. ,2020) engagement, brand trust and brand loyalty (Ebrahim,2019, Hung et al. (2018)). Zhang et al. (2023) emphasize TikTok's role in influencing customer purchase intentions through perceived value and emotional pleasure. Zhang et al. (2023) point out how emotional pleasure mediates between perceived value and purchase intention. Quin et al. (2020) explore the influence of Mobile Augmented Reality (MAR) on decision-making. Kim et al. (2008) examines how retail channel features (online, catalogue, and physical) affect consumer perceptions and purchases. Drummond et al. (2020) study digital engagement strategies for social media marketing capacity. Cheung et al. (2020) highlight how SMM components like e-WOM influence consumer-brand engagement and satisfaction. Cao et al. (2021) show that media richness moderates engagement behaviours. Doyle et al. (2020) finds that content type (e.g., athletic performance) impacts consumer interaction on Instagram. Mou and Boxin (2020) examine user-generated versus sponsored content in the beauty industry. Javed et al. (2022) apply the AISAS model to show how influencers affect decision-making. Panigyarkis et al. (2019) use self-brand connection theory to explore the relationship between SMM and brand attachment. Schivinski (2021) develops a typology of cognitive rules for social media engagement.

The study comes to the view that brand self-expression and consumer involvement both taken from the original model have a major impact on social media interaction with luxury companies. This, in turn, predicts formerly unstudied outcomes like brand image and loyalty. These studies provide valuable insights into the strategies that can enhance customer satisfaction and highlight challenges marketers face in the ever-evolving digital landscape.

Research gap and rationale of the study

Research in the field of consumer satisfaction with multimedia marketing channels in personal care products has primarily focused on identifying its impact on brand awareness and isolated aspects of marketing strategies or single strategies like social media or email marketing without considering the synergic impact of an integrated multimedia approach. Furthermore, while customer satisfaction is frequently measured, its direct relationship with other critical factors like engagement and purchase intention remains unexplored. This gap is significant as understanding these relationships is crucial for developing effective marketing strategies that not only attract customers but also foster long-term loyalty and enhance brand reputation. Therefore, this study aims to fill this gap by investigating how various multimedia marketing channels collectively influence customer satisfaction, engagement, purchase intention, and brand reputation in the personal care sector. This research will provide

valuable insights for marketers to optimize their strategies, ultimately leading to improved customer experiences and stronger brand equity.

The rationale behind the research is rooted in the dynamic environment of digital marketing and the increasing importance of personal care goods in customers' daily lives, it is crucial for firms looking to gain a competitive advantage to comprehend how multimedia marketing methods impact consumers' decision-making processes. This study looks at how engagement, purchase intent, and brand reputation interact to identify the fundamental processes influencing consumer behaviour in the personal care industry. Hence the study is titled Customer Satisfaction of Multimedia Marketing Channels in Personal Care Products.

Statement of the problem

The positive impact of multimedia channels in boosting consumer satisfaction for personal care goods is still not well known in the quickly changing marketing landscape. The personal care sector is characterized by intense competition and a wide range of products to meet the varying needs and tastes of consumers. To reach and engage their audience, brands heavily invest in multi-media marketing, utilizing a combination of traditional and digital platforms. It is not extensively documented, yet, how much these initiatives contribute to higher customer satisfaction. Understanding how different multimedia marketing techniques affect consumer engagement, purchase intention, and brand reputation in this particular industry is crucial.

Even with the widespread use of multimedia marketing, organizations frequently encounter difficulties in crafting coherent and captivating storylines that connect with consumers on various media. This discrepancy may cause customers' experiences to become fragmented, which would ultimately lower satisfaction levels. Furthermore, while the effects of individual marketing channels have been thoroughly examined, little is known about how several channels interact and how this affects consumer behaviour as a whole. This information gap is especially important for personal care items, as brand credibility, product efficacy, and emotional connection are all major determinants of customer decisions.

The problem is further compounded by the evolving expectations of modern consumers, who seek personalized and interactive experiences. Traditional metrics of success, such as reach and frequency, are no longer sufficient. Instead, marketers need to focus on deeper engagement metrics, such as customer involvement, loyalty, and advocacy. Understanding how multimedia marketing can drive these outcomes is essential for developing strategies that not only attract but also retain customers in the long term.

Therefore, this study seeks to address these gaps by examining the relationship between multimedia marketing channels and customer satisfaction in the personal care products industry. It will explore how engagement, purchase intention, and brand reputation mediate this relationship, providing a comprehensive view of the factors that drive consumer satisfaction. The insights gained from this research will be invaluable for marketers looking to refine their multimedia strategies, ensuring they deliver cohesive and impactful marketing experiences that enhance customer satisfaction and brand loyalty. Hence the study is titled “Customer Satisfaction of Multimedia Marketing Channels in Personal Care Products.”

Objectives of the study

- To identify and evaluate the most preferred multimedia marketing channels in personal care products.
- To identify and evaluate the most influencing factors that lead to the purchase of personal care products through multimedia marketing channels.
- To evaluate consumer satisfaction concerning variables such as consumer engagement, purchase intent, and brand reputation.
- To analyse overall satisfaction with multimedia marketing and classify customers based on Net Promoter Score.

Scope and significance of the study

The scope of the study revolves around investigating the customer satisfaction of multimedia marketing channels in the personal care products industry, with a primary focus on engagement, purchase intent, and brand reputation. The diverse nature of multimedia marketing, encompassing varied channels such as videos, social media, influencers, and more, provides an intricate landscape for understanding how consumers interact with and interpret information about personal care products. Examining the purchase intent provides valuable insights into the likelihood of customers purchasing personal care products based on their exposure to multimedia marketing. The study aims to uncover the impact of various promotional strategies on shaping consumer preferences, influencing purchasing decisions, and ultimately contributing to brand success within the competitive personal care market.

Significantly, this research seeks to explore the nuanced dynamics of consumer engagement with multimedia content in the personal care sector. Understanding the extent to which individuals actively participate in, share, and respond to multimedia marketing efforts sheds light on the interactive elements that resonate with consumers. Furthermore, assessing the impact of multimedia marketing channels on brand reputation is important for maintaining a positive image in the eyes of consumers. Positive brand perception can lead to increased trust, loyalty, and advocacy, while negative perceptions can result in loss of customers and damage to brand credibility. In essence, this study seeks to clear the intricate connections between engagement, purchase intent, and brand reputation within the field of multimedia marketing channels for personal care products.

Hypotheses

H0: There is no significant difference in customer preference among various multimedia marketing channels for personal care products

H0: There is no significant difference in mean ranks of factors influencing the purchase of personal care products through multimedia marketing channels.

H0: There is no significant difference in consumer engagement, purchase intent, and brand reputation based on the age of the respondents.

Research methodology

This study's research approach uses an analytical and descriptive design to assess customer satisfaction with multimedia marketing channels for personal care products. While secondary data is gathered from reliable publications and websites, primary data is gathered using online questionnaires given to a sample of 147 consumers who have engaged with advertisements for personal care products. Convenience sampling is used in the sample selection process to guarantee a diversified representation. To ascertain satisfaction variations among marketing channels, data analysis employs the Friedman and Kruskal-Wallis tests. Additionally, the Net Promoter Score (NPS) is utilized to assess overall consumer attitude and loyalty. On a scale of 0-10, respondents would be categorized as Promoters who score 9 or 10, Passives scores (7-8), or Detractors (0-6), and the NPS would be calculated by subtracting the percentage of Detractors, from the percentage of Promoters. This method offers a thorough grasp of consumer views regarding personal care items and efficient marketing channels.

Limitations of the study

- The study is conducted for a period of six months.
- The degree of accuracy is limited to the period of study.
- The accuracy of primary data is also a constraint for the study.
- Rapid changes in market conditions and consumer preferences can affect the relevance of the study findings over time.
- Factors outside the scope of the study, such as economic conditions, and competitors, can influence customer satisfaction and behaviours.

Analysis and discussion of the results

The objectives were analysed using hypotheses on Customer Satisfaction of Multimedia Marketing Channels in Personal Care Products based on three variables such as consumer engagement, purchase intent, and brand reputation. Friedman Test and Kruskal Wallis Test were used for proper analysis and arriving at conclusions. Net Promoter Score is used for analysing the overall satisfaction rate.

H0: There is no significant difference in customer preference among various multimedia marketing channels for personal care products.

Table 1: Statement showing Mean Rank and Table showing Test Statistics

Multimedia marketing channels	Mean rank	N	Chi-Square	df	Asymp.Sig
Television	3.02	147	371.806	8	.000*
YouTube	3.17				
Instagram	3.47				
Facebook	4.21				
Twitter	5.93				
News websites	5.53				
Branded websites	6.09				
Blogs	6.78				
Influencer collaborations	6.80				

Friedman Test

It is evident from Table 1 that the customer preference among various multimedia marketing channels for personal care products shows that the lowest mean on the multimedia marketing channels is for television (3.02) followed by YouTube (3.17) in the matrix. variable having rank one should have the lowest mean. it may be concluded that television is the most preferred multimedia marketing channel according to customer's preference. This mean rank variation is statistically significant at a 5 percent level of significance. (The value of the Chi-Square is 371.806 with $p.000 < .05$). so the null hypotheses is rejected with the conclusion that there is a significant difference in customer preference among various multimedia marketing channels for personal care products.

H0: There is no significant difference in mean ranks of factors influencing the purchase of personal care products through multimedia marketing channels.

Table 2: Statement of Mean Rank and Test Statistics

Factors	Mean Rank	N	Chi-Square	df	Asymp. Sig
Price	2.62	147	962.592	12	.000*
Brand Reputation	4.24				
Multimedia Advertisements	5.50				
Recommendations from friends and family	5.37				
Product Reviews	5.97				
Packaging	7.78				
Ingredients	7.74				
Effectiveness	8.24				
Visual Appeal	9.70				
Clear and concise product information	9.62				
Customer Reviews	10.74				
Educational Content	10.94				
Offers and discounts	2.54				

Friedman Test

It is evident from Table 2 that the factors influencing the purchase of personal care products through multimedia marketing channels show that the lowest mean on the factors is for offers and discounts (2.54) followed by price (2.62) in the matrix. Variable having rank one should have the lowest mean. It may be concluded that offers and discounts are the most important factor influencing the purchase of personal care products through multimedia marketing channels. This mean rank variation is statistically significant at a 5 percent level of significance. (The value of the Chi-Square is 962.592 with $p.000 < .05$). so the null hypotheses is rejected with the conclusion that

there is significant difference in the mean rank of factors influencing the purchase of personal care products through multimedia marketing channels.

H0: There is no significant difference in purchase intent, customer engagement, and brand reputation based on the age of the respondents.

Table 3: Test statistics on purchase intent based on the age of respondents

Variable	Age of the respondents	N	Mean Rank	Chi-Square	df	Sig.
Purchase Intent	Less than 20	4	105.25			
	20-30	86	63.83			
	30-40	30	94.42	15.899	4	.003*
	40-50	19	85.42			
	50-60	8	64.00			

a. Kruskal Wallis H Test b. Grouping Variable: Age of the Respondents

Table 3 shows the Purchase Intent based on the age of the respondents. The age-based analysis shows that all factors at 5 percent level of significance is less than 0.05, the null hypotheses is rejected with the conclusion that there is significant difference in purchase intent based on the age of the respondents. ($p.03 < .05$).

Table 4: Test statistics on customer engagement based on the age of the respondents

Variable	Age of the respondents	N	Mean Rank	Chi-Square	df	Sig.
Customer Engagement	Less than 20	4	69.50			
	20-30	86	62.02			
	30-40	30	96.13	19.360	4	.001*
	40-50	19	93.87			
	50-60	8	74.81			

a. Kruskal Wallis H Test b. Grouping Variable: Age of the Respondents

Table 4 shows the significance value of customer engagement based on age of the respondents. The analysis shows that all factors at 5 percent level of significance is less than 0.05, the null hypotheses is rejected with the conclusion that there is a significant difference in customer engagement based on age of the respondents. ($p.01 < .05$).

Table 5: Test statistics on brand reputation based on the age of the respondents

Variable	Age of the respondents	N	Mean Rank	Chi-Square	df	Sig.
Brand Reputation	Less than 20	4	84.38			
	20-30	86	62.79			
	30-40	30	99.52	18.071	4	.001*
	40-50	19	83.05			
	50-60	8	72.13			

a. Kruskal Wallis H Test b. Grouping Variable: Age of the Respondents

Table 5 shows the significance value of the brand reputation based on the age of the respondents. The analysis shows that all the factors at 5 percent level of significance are less than 0.05, the null hypotheses is rejected with the conclusion that there is a significant difference in brand reputation based on the age of the respondents. ($p.01 < .05$).

Observation based on overall analysis

Table 6: Customer satisfaction of multimedia marketing channels for personal care products

Customer categories	Percentage
Detractors	22
Passives	71
Promoters	7
Total	100
NPS	-15

Source: Primary data

Table 6 Portrayed analyses based on Net Promoter Score which measures the satisfaction of the customers. Customers are divided into three detractors, passives and promoters. Only 7 percentage are loyal and around 71 percentage need special care to retain in the customer category and 22 percentage are not loyal and wont stick on to the product or their opinion.

Conclusion:

The study on customer satisfaction of multimedia marketing channels in personal care products underscores the pivotal role of multimedia marketing channels in driving customer satisfaction within the personal care products industry. On analysing the customer's preference for receiving personal care product advertisements, television is the most preferred multimedia marketing channel. Offers and discounts are the most important factors in analysing the factors influencing the purchase decision of personal care products via multimedia marketing channels. On analysing the satisfaction of customers with multimedia marketing channels for personal care products based on Net Promoter Score, it was observed that 22% of the respondents are detractors who are dissatisfied with the multimedia marketing channels, and may even discourage others from doing so. 71% of the respondents are passives who are satisfied with the multimedia marketing channels, but they may not be fully engaged or enthusiastic as promoters and they may or may not recommend the channels to others. The rest 7% of the respondents are promoters who are highly satisfied, loyal, and enthusiastic customers who could recommend others about the multimedia marketing channels for personal care products. It is observed that there is a significant difference in purchase intent, customer engagement, and brand reputation based on the age of the respondents.

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Marketing Strategies and SME Firm Performance During Uncertainty- A Conceptual Framework

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Abstract

This study aims to investigate the different marketing strategy (MS) connection with the performance of small and medium enterprises (SMEs) during periods of uncertainty. More specifically, the study explores the key components of MS, how these influence SME firm performance, and how uncertainty acts as a moderator between the relationship. A conceptual framework is developed on the basis of the review of present literature on MS, SME firm performance, and uncertain time period. The framework identifies key components of marketing strategies, as what SMEs are selling- product, how much they charge- price, where they sell it- distribution, and how they advertise it- promotion, and explored their impact on SME firm performance variables like sales, market share, return on advertising spends etc. In addition to this, uncertainty's role as a moderator on marketing strategies with SME firm performance is explored. The literature review suggests a positive link between marketing strategies and SME firm performance. Though, this relationship may be influenced by the level of uncertainty present. During periods of high uncertainty, the effectiveness of certain marketing strategies may be more or less impactful on the SME firm performance. Furthermore, as the study is literature review based thus limited by its dependance on existing literature and the conceptual nature of its framework. Empirical study is required in order to confirm findings along with more real understanding of present relationship in between different marketing strategies, SME performance, and uncertain time period. The study's findings showcase practical implications for those SMEs who are interested in improving their performance during uncertain times. By implementing effective marketing strategies, SMEs can increase its competitiveness, market share, and profitability. However, it is also important to study the specific type of the SME business and the level of uncertainty present in the market while implementing different marketing strategies.

Keywords: firm performance, marketing strategy, SME, uncertainty.

Introduction

The small and medium size enterprises (SMEs) are crucial contributors in the economic growth worldwide (Srinivas, 2013; Nadaf & Kadakol, 2017). These businesses play a particularly significant role in developing countries (Nganga, 2011). Globally, SMEs are major sources of employment and economic development, accounting for approximately 90% of global businesses and over half of worldwide job opportunities (World Bank, 2024; Knight, 2000). By considering the SMEs important role playing for the growth of Indian economy, their effective performance is crucial for the country's development. However, these firms often face significant challenges, particularly in periods of uncertainty, which can impact SME performance and their long-term sustainability (Alberti et al., 2018).

This underscores the importance of studying marketing strategies and SMEs firm performance especially during uncertain time.

The relation between marketing strategies (MS) and the SMEs performance has been a subject of considerable scholarly attention (Barney, 1991; Porter, 1985). Previous research has generally established a positive relationship among effective marketing strategies and firm outcomes (Coviello & Sinkovics, 2003). However, the impact of uncertainty on this relationship remains a relatively understudied area (Hill & Jones, 2016).

The present study aims towards exploring of the MS relationship with SME firm performance, along with the moderating role of uncertainty. Through examining these factors, this study seeks to present valuable understanding for SMEs searching to navigate challenging market conditions along with improvement in their overall performance. To provide initial grounding for the proposed framework, preliminary empirical work was conducted using data from 135 SMEs. This analysis revealed significant effects of uncertainty as a moderator on the relationships between marketing strategies (specifically, promotion and product development) and SMEs performance and indicated that the intensive levels of environmental uncertainty amplify the promotion strategies effect on SMEs performance positively, suggesting that effective promotion is particularly crucial in unpredictable markets. Conversely, the analysis revealed that uncertainty has the inverse moderating effect upon product development-performance relationship, implying that the returns on product innovation may be diminished in

uncertain environments. These initial empirical findings offer preliminary support for the framework's core premise that the effectiveness of marketing strategies is contingent upon the level of environmental uncertainty.

Literature Review

This section reviews the relevant literature and is organized as follows: Firstly, the literature on marketing strategies is reviewed, exploring key components and their impact on firm outcomes. Secondly, the concept of environmental uncertainty and its various dimensions are discussed. Thirdly, the literature on SME firm performance is examined, considering relevant performance indicators. Finally, the review synthesizes existing research on the interplay between these three factors with focus on the moderating role of uncertainty in the marketing strategy-performance link.

Marketing Strategy

The present literature shows the importance of SMEs marketing strategies towards its enhanced firm performance. A significant body of research has examined the factors that constitutes marketing strategies.

Cooper (1984) examines the relationship between new product strategies and performance. He identifies four key components of new product strategy: product type, target market, technology, and process orientation. Performance was assessed based on sales, profit, and success rates and conclude that it is closely linked with the new product strategy, and firms from various industries adopt different strategies.

Greenley (1989) explored the marketing strategy concept along with its underlying components. Through a literature review, the researcher identifies two levels of marketing strategy: long-range marketing planning (tactical planning) within operational planning, and corporate strategy. To gain a deeper understanding of marketing strategy, Greenley proposed a third level consisting of market and product positioning, 4Ps, market entry, and timing as five different components. The author cautioned that focusing on these components within the marketing context could potentially lead to confusion with existing knowledge about marketing strategy.

Doole et al. (2006) conduct a study by using the tool of semi structured interviews on 250 SMEs situated in UK's Yorkshire and Humber region and finding suggest that marketing strategies related with product, price, place and promotion are among 17 identified vital processes and practices with activities linked to the performance of SMEs export. Researchers primarily related success to export marketing strategy which consists of generation, management and dissemination of knowledge, External relationships and networks, product strategy and pricing strategy.

The study carried out by O'Dwyer et al. in 2009, identify that the marketing strategies related with innovation act as a strong tool to navigate changing conditions of market for SMEs. The research also suggest that SMEs uses a number of marketing strategies including cost leadership, differentiation and niche strategies for better firm performance. The result leads to effective targeting and reaching to target customers, developing unique value propositions, and able to react in changing market condition.

The study titled "An investigation of marketing strategy, business environment and performance of construction SMEs in China" by Yan & Chew (2011), illustrate the marketing strategies in two categories as relationship and competitive marketing strategies. Relationship marketing strategy deals with resources related with networking and alliances while the deployment of capabilities and resources is dealt by competitive marketing strategies. Both kind of MS leads to SME firm performance

Trivedi (2013) in his study on SMEs marketing strategies identify that SMEs are implementing different innovative marketing strategies for increasing the performances. Various innovative marketing strategies used by SMEs includes use of digital modes for advertisement including world wide web, using mobile applications as a service tool for their customers and customer relationship management, improved customer feedback including digital channels as per their available resources and individual competences.

Idris and Momani (2013) empirically examine the effect of environmental dynamism on comprehensiveness marketing strategy and firm performance. The comprehensiveness marketing strategy studied with 5 items and shows that the marketing strategy comprehensiveness affected the performance of organisation significantly.

Uncertainty

Jauch and Kraft (1986) acknowledges that March and Simon (1958) are among the first to recognize the significance of uncertainty within organizations. By comparing selected analysts' perspectives on environmental uncertainty, they highlight the classical view, which attributed uncertainty primarily to external factors (March &

Simon, 1958). These analysts suggests that the external environment influences a firm's decisions, structure, and performance.

Milliken (1987) emphasize the importance of clear definitions and measurements for environmental uncertainty to avoid confusion among organizational administrators. The researcher identifies three distinct perceived environmental uncertainty as state, effect, and response uncertainty. These three were different based on the information lacking in the administrator's perception. The lack of understanding about the nature of environmental conditions was defined as state uncertainty. Effect uncertainty arises when administrators are unsure about the potential impact of environmental changes on the organization. Response uncertainty occurs when administrators are unclear about available response options or the potential outcomes of their choices.

Miller (1992) classify the uncertainties faced by globally operating firms in three different categories. One category devised as environment uncertainties in general which further consist of factors related with country's politics, policies of the government, factors at the macro-economic level, factors related with society, and factors related to nature. The second uncertainty category relates with industry which further encompass factors related to input, product, and competitive markets. The last as firm-specific uncertainty which further contains factors related with operations, firms liabilities, R&D, availability of credit facility, and organization behavior.

Courtney et al. (1997) proposes the framework which present the uncertainty at 4 different levels and named as, "clear enough future," "alternate futures," "range of futures," and "true ambiguity." They also outline three postures as "shaping, adapting, reserving the right to play" and 3 strategic moves as "big bets, options and hedges, no regret moves" as a comprehensive approach to manage uncertainty. This provides a valuable tool for making strategic decisions at different uncertainty levels.

Simangunsong et al. (2012) investigate various uncertainty sources that impact the performance of Indonesian SMEs in Yogyakarta. The theoretical framework categorize uncertainty into three levels: internal organizational, supply chain, and external. Internal organizational uncertainties include "product characteristics, manufacturing processes, control and response challenges, decision complexity, organizational structure, human behavior, and IT complexity". Supply chain uncertainties encompass "end-customer demand, demand amplification, supplier factors, parallel integration, lead time gaps, and chain configuration." External uncertainties consist of environmental factors (political, government policy, macroeconomic) and disruptions (man-made or natural disasters).

Sniazhko (2019) conduct international business literature review to explore the concept of uncertainty. The author developed a framework of uncertainty with 13 dimensions, categorized into "environmental, industry, and firm uncertainty". Environmental uncertainty included "economic, political, governmental, cultural, and discontinuous factors." Industry uncertainty encompassed "input, demand, competition, and technological factors." Firm uncertainty covered "behavioral, research and development, operating, and previous experience factors."

Cascaldi et al. (2023) explores the comprehensive overview of existing measures of uncertainty, risk, and volatility, clarifying their conceptual differences. It summarizes the construction of these measures, their relative advantages, and their impact on financial markets and economic outcomes. While increased uncertainty is often linked to negative real and financial results, the extent of these effects and the interpretation of transmission channels are significantly influenced by identification factors.

Sme Firm Performance

Richard et al. (2009) explores the firm performance in 3 different measures as "financial performance, product market performance and shareholder return." SME performance consisting profits, returns on investment (ROI) and returns on assets (ROA) included in financial performance. The market performance based on product, consist of sales, market share etc while the last one "shareholder return" consists of "total shareholder return and economic value addition."

Adewale et al. (2013) investigates the marketing strategy effect on business performance from selected Nigerian SMEs. The finding showed that marketing strategy (i.e marketing mix, packaging and after sales service) are significantly predicting firm performance ("profitability, market share, return on investment, and expansion").

Dzisi and Ofosu (2014) in their research on Ghanaian SMEs investigate the marketing strategies and firm performance relationship, focusing on "profitability, brand awareness, and market share". The study poses a positive correlation between marketing strategies and Ghanaian firm performance. By examining traditional and non-traditional marketing practices, the authors suggest a stronger association between SME firm performance and traditional marketing strategies compared to non-traditional ones in Ghana.

Sopha et al. (2020) in their study take returns on sales, profitability and sales growth as the SME firm performance indicators. This was adopted from Merschmann and Thonemann (2011). The study also explores the uncertainty indicators as “internal organizational uncertainty, internal supply chain uncertainty and external uncertainty.”

Sharfaei et al. (2023) explores that to achieve performance goal the SME must navigate from market uncertainty. The study provides valuable insights for international SMEs operating in developing markets. By leveraging comprehensive knowledge of market uncertainty, these SMEs can enhance their performance. The empirical findings reinforce the idea that understanding the effects of uncertainty is crucial for achieving high performance, especially in developing markets, which are often characterized by ambiguity.

Marketing Strategy, Firm Performance And Uncertainty

Hanna et al. (1975) proposes that firms should adjust their MS in response to the evolving American business environment, characterized by resource scarcity. They highlight key changes in the legal, political, consumer, and competitive landscapes and suggested short-term strategies such as adjusting product mix, pricing, promotion, and distribution channels.

Shama (1978) presents a conceptual framework examining the interconnectedness of economic changes, firm marketing strategies, and consumer behavior. The author defines economic change as stagflation, a combination of shortages, inflation, and recession. Through two complementary surveys, the study investigates the impact of stagflation on both firm marketing activities and consumer responses. The findings reveals that consumer reactions to marketing strategies differed significantly between stagflation and pre-stagflation periods. To effectively manage marketing during stagflation, organizations should consider adjusting product offerings, pricing, distribution channels, and promotional activities, with a particular focus on pricing strategy.

Kotha and Nair (1995) investigate the influence of strategy along with environment on firm performance. The findings reveals that both strategy and environmental factors significantly impact profitability, while environmental variables also influence firm growth.

Cass and Julian (2003) investigate the effect of environmental factors and export marketing mix strategies on Australian export firms' performance. The study finds that environmental factors including intensity of competition, political-legal factors, customer exposure, and channel accessibility, significantly influence both export marketing mix strategies and managerial environmental scanning. While environmental scanning led to better export marketing performance, adapting marketing mix strategies was not directly associated with improved export performance.

Koksal and Ozgul (2007) explored the impact of marketing strategies on firm performance during the 2000-2001 economic crisis on Turkish companies. Firm performance measure by “sales volume, market share, and profitability.” The research reflects that relying solely on price changes to increase sales volume and profit is not effective. However, strategies such as training sales staff, investing in research and development, entering foreign markets long-term, and engaging in customer communication through promotion positively influence firm performance. Reducing prices and quality, on the other hand, can negatively impact performance.

Idris and Momani (2013) empirically tested the environmental dynamism impact on “marketing strategy comprehensiveness and organizational performance”. The study shows that two items Intensity and frequency of change constitutes environmental dynamism and significantly affected the SME performance. Additionally, marketing strategy implementation is directly affected by environmental dynamism.

On basis of review of literature, Chin et al. (2014) develop a conceptual model examining the environmental uncertainty moderation on the external integration and firm performance relationship in manufacturing SMEs of Malaysia. Environmental uncertainty was categorized into demand and technological uncertainty with company threats. External integration encompassed supplier relationships and customer relationships. The study finds that environment uncertainty adverse effects of on firm performance can be lessen with external integration.

Hadi and Supardi (2020) conduct a study on SMEs in the developing tourism center of Yogyakarta, Indonesia, to investigate revitalization strategies post-COVID-19. Using the business model canvas (BMC), the study identifies eight key strategies as “value proposition, key activities, customer relationships, customer segments, key partners, channels, cost structure, and revenue streams.” By prioritizing specific areas and products, the study aimed to develop effective revitalization strategies for SMEs in the region.

Conceptual Model

The study suggests a conceptual model and shown in Fig. 1 to explain how environment uncertainty moderating the relationship between marketing strategies and SME firm performance which indicates three constructs. First,

the marketing strategies which is considered as independent variable, second, the SME firm performance which is considered as dependent variable and the third, uncertainty which moderates the relationship among marketing strategies and SME performance. The framework postulates that, the effectiveness of different marketing strategies is dependent upon the level of environmental uncertainty faced by SMEs.

Marketing Strategies Construct

Marketing strategies consists the set of planned activities assumed by SMEs to attract, retain, and grow its customer base. This study focuses on the traditional marketing mix elements, often referred to as the 4Ps:

Product: This refers to the goods/services offered by SME, including features, quality, branding, and packaging. Effective product strategies involve developing offerings that meet customer needs and differentiate the SME from competitors (Cooper, 1984).

Price: Price represents the monetary value exchanged for the product or service. Pricing strategies involve setting prices that are competitive yet profitable, considering factors such as cost, demand, and competitor pricing (Doole et al., 2006).

Place (Distribution): The channels by which the product/service is provided to customers. Place strategies involve actions regarding distribution channels, logistics, and retail presence (Doole et al., 2006).

Promotion: Promotion means all communication activities used to notify, convince, and making the customers to remember about the SME's offerings. Advertisement, PR, sales promotions, and digital marketing are part of promotion (Trivedi, 2013).

Sme Firm Performance Construct

Firm performance reflects the overall success of the SME to achieve organisational objectives. This study considers several key performance indicators:

Sales: The total revenue generated from sales of products/services.

Market Share: The market percentage controlled by the SME.

Return on Advertising Spend (ROAS): A measure of the effectiveness of advertising campaigns.

Profitability (ROA, ROI): Measures of the SME's profitability and return on investment.

Uncertainty Construct

Environmental uncertainty means the level by which the external environment is unpredictable and hard to forecast (Milliken, 1987). This study considers different dimensions of uncertainty:

Firm Specific/Internal: operating uncertainty, R&D uncertainty, credit uncertainty, manufacturing uncertainty - machine breakdown, labor problem (Sniazhko, 2019).

Market Uncertainty: Unpredictability in customer demand, competitor actions, and market trends (Simangunsong et al., 2012).

Supply Chain Uncertainty: Suppliers uncertainty - suppliers related issues like problem with quality, availability of supply/suppliers (Simangunsong et al., 2012).

Technological Uncertainty: Rapid changes in technology that can impact the SME's products, processes, or competitive landscape (Simangunsong et al., 2012).

Competitive Uncertainty: Unpredictability in the actions of competitors (Miller, 1992).

Environmental Uncertainty: Unpredictability arising from broader economic, political, social, or regulatory factors (Miller, 1992).

Constructs In-Between Relationship

The framework proposes that each marketing mix elements (“product, price, place, and promotion”) has a direct relationship with SME firm performance. However, these relationships are moderated by the level of environmental uncertainty.

Effective marketing strategies are generally expected to positively influence SME firm performance and shows direct effect. For example, developing innovative products, setting competitive prices, ensuring product availability, and implementing effective promotion campaigns can all contribute to increased sales, market share, and profitability (Adewale et al., 2013; Dzisi and Ofosu, 2014).

Environmental uncertainty is hypothesized to moderate the marketing strategies and SME firm performance relationship. The framework suggests that, effectiveness of different marketing strategies changes on the basis of uncertainty level. For example, under highly

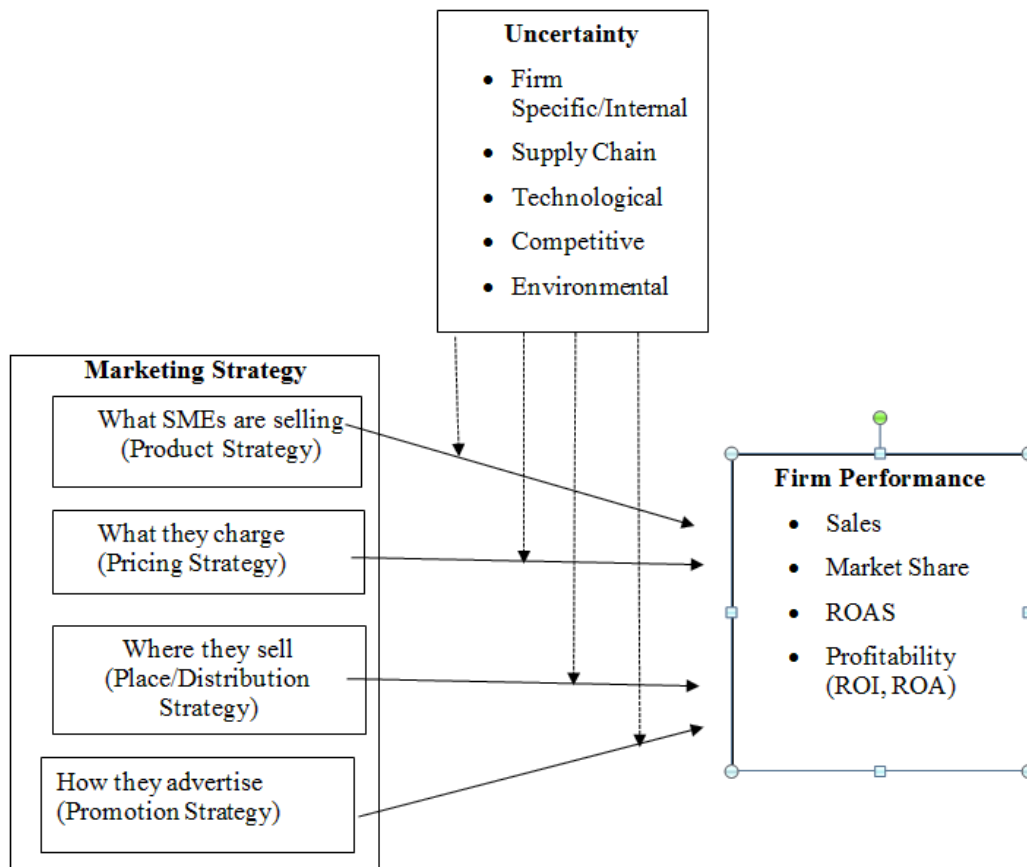


Fig. 1: Conceptual Model Source: Authors own based on literature review

This conceptual model offers a foundation for understanding how marketing strategies, SME performance, and environmental uncertainty interact.

Conclusion and Future Research

The research paper extensively reviews the marketing strategies literature and highlight that the different marketing strategies affects the SME firm performance positively and adverse effects of various uncertainty can be neutralized with the effective use of MS for SME firm performance. Efforts have been attempted to check the uncertainty moderation on the marketing strategies and SME firm performance relation. During high uncertain periods, the effectiveness of certain marketing strategies may be more or less impactful on the SME firm performance. It suggests that SMEs need to adapt their marketing strategies to the level of uncertainty they face in order to maximize their performance.

In terms of limitations as the study is literature review based thus limited by its dependance on existing literature and the conceptual nature of its framework. Additionally, a smaller number of researches have been done which

shows the moderating role of different uncertainties on marketing strategy implementation and SME firm performance relationship.

Empirical research is required to confirm the findings with more depth understanding about different marketing strategies, SME firm performance, and uncertain time period relations. The proposed propositions offer testable statements that can be empirically investigated in future research. Also, the study did not examine any specific marketing strategies that may be most effective at the different levels of uncertain environment. Thus, a more comprehensive study, including a larger sample size and a wider range of industries, would allow for more robust statistical analysis. Specifically, future research should examine the individual and combined effects of the various dimensions of uncertainty on marketing mix strategies and SME performance relationships with presentation of the full statistical results, including interaction plots and detailed regression diagnostics in order to enhance the understanding of these complex dynamics.

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Evaluation of Post-Merger Performance of Select Bse- Listed Indian Companies – A Systematic Study Using Data Envelopment Analysis

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Abstract

This paper tries to find the post-merger impact in comparison with pre-merger period on BSE-listed 50 companies or decision-making units (DMUs) those underwent merger between 01.04.2013 to 31.03.2014 with its 5 years pre-period and post-period average data by applying standard Data Envelopment Analysis (DEA) in a specific input-output combination. Input oriented DEA model is used here to analyze the impact in post-merger scenario on different parameters like efficiency score, return to scale, ranking etc. The results of the study find that due to the merger CCR scores of the DMUs deteriorated during post-merger period in comparison with pre-merger period but the scale efficiency improved in some of the DMUs which is a positive sign for those DMUs. But the ranking of the DMUs according to PTE scores deteriorated after the merger in comparison with pre-merger period.

Keywords: BSE, DEA, Efficiency Measurement, Scale measurement, Merger.

Introduction

One of the effective and useful method for assessing a company's or DMUs performance by a non-parametric method after the merger is Data Envelopment Analysis (DEA). The DEA offers important insights into the operational and financial synergies produced by M&As by comparing the efficiency of combined entities against their pre-merger counterparts and industry peers. In order to examine how mergers affect a firm's performance, this study uses DEA, with a particular focus on [aspects such as productivity, scale efficiency, or technical efficiency]. This study evaluates the long-term impacts of M&As on firm performance using a comprehensive dataset of 50 mergers from the BSE database over five years prior to and five years following the merger year. The study's conclusions refine our understanding of the efficiency gains and losses connected to merger activity, adding to the body of knowledge already available on M&As. Corporate strategists, decision-makers, and investors looking to minimize risks and maximize merger outcomes should take note of the significant implications our research holds for them.

Literature Review

Impact of mergers and acquisitions (M&A) specifically on the profitability on the banking sector of Malaysia was analysed by using a three-stage data envelopment analysis (DEA) was conducted by Sufian (2009). Various parametric and non-parametric tests were employed to investigate shifts in the banking system's efficiency before and after the merger. Finally, panel regression analysis was used to assess the banks' effectiveness while accounting for contextual factors. The analysis of seven merger scenarios revealed that the acquiring bank's profit efficiency increased in six of them.

Variety of statistical techniques, including paired sample t-tests, DEA, and t-statistics, used by Lai et al. (2015) to examine performance of Malaysia's banking sector after 2000. Researchers found that there had been no discernible improvement in the combined banks' performance or efficiency.

This research paper was investigated by Nguyen et al., (2022) to find the efficiency levels of 30 Vietnamese commercial banking institutions those was merged from 2011 to 2019 using a specific DEA approach. After that by using a specific regression, this paper indicates that mergers and acquisitions have a detrimental impact on bank efficiency.

This article by Wanke et al., (2017) conducts an analysis on M&A in South African banking institutions to calculate the impact of specific factors on the resulting virtual merged banks' efficiency ratings, a network DEA approach is used. The impact of specific variables relating to the bank's origin and kind is investigated using a series of robust regression that handle dependent variables bounded in 0 and 1 that is Tobit, Simplex, and Beta. The results showed that bank type and origin have an impact on virtual efficiency. The study concluded that scale and harmony effects are insignificant because of South Africa's oligopolistic banking system.

In this study Halkos and Tzeremes (2013) utilized a specific DEA procedure to estimate the short-term impact of M&A on operational efficiency enhancements of potential 45 banking industry of Greek between 2007 and 2011. It was revealed that the majority of proposed bank mergers did not yield short-term operating efficiency advantages in the year preceding and following the time of the Greek economic crisis. However, the results from 2011 indicated that most bank M&A could lead to short-term operational efficiency benefits. In the end, the empirical results confirmed the idea that efficient bank M&A is not always guaranteed by the merger or acquisition of other efficient banks.

After comparing the banks' pre- and post-merger efficiency in the three years prior to and following the merger, Jayaraman et al. (2014) used DEA to analyze the impact and effectiveness of Indian banking sector following M&A. In order to determine the precise effects of the merger, this study made a comparison between the banks those are already merged with the non-merged banks. The closeness of banks to the efficient frontier was ascertained by interval estimation. According to the research, the combined banks' technical efficiency first declined after the merger but then improved in the third year. Additionally, the study discovered that during the early stages of a merger, there was no discernible effect of M&A on the combined banks' profitability and operating expenses.

The article by Lin et al. (2020) recommended handling mergers and acquisitions (M&A) matching by DEA approach. Technical and scale efficiency measures were considered in order to establish reliable matching degrees between target and acquiring companies. In particular, the scale return of the combined decision-making units (DMUs) was ascertained using a traditional DEA model, whereas a reverse DEA model was developed to evaluate technical efficiency. An optimization model was then developed to generate comparable outcomes with the goal of improving DMU performance. To illustrate the suggested strategy, an analysis of M&A matching in Turkish energy companies was carried out, which revealed that scale efficiency and technical efficiency have a major impact on M&A matching practices.

The research examined the cost effectiveness of the banking industry by analysing secondary data from CMIE Prowess covering the period from 2010 to 2015 for specific banks in India by Silambarasan and Azhagaiah (2016). The analysis was conducted by using descriptive statistics and DEA methodology, and the outcome/result of the study refute the notion that there is no significant variation in the cost effectiveness of the sample banks based on the methodologies employed. Consequently, the study indicates a satisfactory overall level of efficiency during the evaluation period, with average efficiency ranging from 0.94 to 1 under CRS and from 0.75 to 1 under VRS. The results demonstrate that minimizing investment in equity in favour of increased loan and advance creation is the most efficient approach for enhancing the operational efficiency of underperforming banking companies.

This research conducted a practical evaluation of the consolidation of commercial banks in Gulf countries by Gattoufi et al., (2009). The study utilized DEA to assess the effect of M&A on the operational efficiency of banks participating in the consolidation. During the period of 2003-2007, the study examined 42 commercial banks, 10 of which were engaged in consolidation activities. The primary finding was that, there is a favourable impact of M&A on the commercial banks' performance. Additionally, the majority of banks those underwent M&A experienced an improvement in their performance surpassing the average companies/banks achieved, thus enhancing their performance at a faster than the market scenario.

This research by Bai et al., (2019) intertwines resampling DEA with the prospective benefits of mergers model to preliminarily assess efficiency enhancements of 3 notable M&A strategies namely, regional M&A, megamerger, and an alliance among the 'strong' and 'weak' railway bureaus within China's railway domain during the years 2011–2015. The findings indicate that geographically relevant M&As outperform the other two categories in generating efficiency improvements, owing to the unique nature of the railway industry – characterized by network economics. A well-executed M&A can induce a so-called 'stimulant' effect in the immediate term, yet as the 'stimulant's power' diminishes with time, the impact of the M&A will gradually wane. At this juncture, it becomes especially crucial for policymakers to implement a series of advantageous regulations. Ultimately, the empirical evidence illustrates the notion that a merger involving two (whether efficient or not) DMUs does not guarantee positive benefits from the view point of efficiency.

This paper by Singh (2009) offers a sapience into the effectiveness of combinations in the Indian Banking System by examining the effectiveness benefits of less than 10 mergers among many listed marketable banks in India over the period 2000- 2001 till date and anatomized the recent mergers (involving both private and nationalized banks) by using the DEA. They anatomized the profit effectiveness and cost effectiveness of the acquiring bank to see whether there have been earnings from connection and it was found that while the combinations do not impact the cost and profit effectiveness in an adverse manner and whatever loss that happed originally was recovered snappily.

The effectiveness of M&A among publicly traded companies in Brazil assessed by Junior et al., (2013) and found that the emergence of synergy gains by using models with multiple objectives from Goal Programming and Data Envelopment Analysis (GPDEA) method, using different indicators of accounting as input and output variables. These models enable the analysis and categorization of M&A based on the efficiency attained in these kinds of procedures. When traditional models were applied, a few of the M&A cases under analysis were incorrectly thought to be efficient. Furthermore, the GPDEA was shown to be more successful than classical models, as it was expected. Nevertheless, only a small percentage of the cases examined were found to be successful.

This study used an empirical analysis of 20 M&A transactions in the US commercial banking sector by Rahman et al., (2016) to examine marketing efficiency as a proxy for post-merger performance. Efficiency is measured using Data Envelopment Analysis (DEA), which uses two input variable and two output variables. The findings showed that, despite their tiny impact, M&A transactions do improve the combined companies' marketing effectiveness.

In order to gauge the M&A impact on the financial performance Jena and Sanyal (2024) examined the bank mergers between 2006 and 2018 happened in India. Four Indian banks were chosen as a sample, SBI, Bank of Baroda, HDFC Bank, and Kotak Mahindra Bank and their market capitalization data was taken. Financial performance efficiency was assessed in this paper by comparing five years of pre- merger and post-merger data. Throughout in this research, the writers took into account seven important factors those affecting Indian banks' performance. For measuring efficiency over time, DEA, a non-parametric technique, is employed and the study demonstrates that acquisitions and mergers have a favourable effect on improving financial efficiency.

Objectives of The Study

The objectives of the study is;

- To assess the impact of the merger on the asset management and control on the expenses to maximise operating cash flows and net sales of the acquirer companies (DMUs) in the post-merger time in comparison with the pre-merger time.
- To find out efficient and inefficient companies in the sample data with the present input and output mix.
- To find out the scale of operations before and after the merger.
- To find out the position (Ranking) of the DMUs before and after the merger to judge companies' situation in both the periods.

Methodology and Model Used In The Study

Data Envelopment Analysis (DEA) is a fairly new “data acquainted” non-parametric performance assessment technique to assess the performance of a set of data termed as Decision Making Units (DMUs) which analyse single/multiple inputs with single/multiple outputs. The description of a DMU is general and flexible. The DEA has used a varied range of operations in recent years to evaluate the performances of many different types of realities involved in many different activities in many different settings in many different nations. Efficient DMUs' are assessed using the identical input and output data of varied DMUs. DEA, is first designed by Charnes et al. (1978), constructs an efficient frontier by identifying the best practice DMUs from a common data set. Frontier takes in multiple inputs and provides multiple outputs. The proximity to the frontier determines efficiency. DMUs those are closest to the frontier line are termed as efficient unit and those farther away from the frontier line are inefficient units.

Model of The Study

Various DEA models have been created in the DEA literature since 1978. There are two techniques for this namely, radial and non-radial. Differences exist in the characterisation of inputs and outputs. There are two widely recognised basic DEA models that is CCR model which is called after Charnes, Cooper, and Rhodes, 1978 and the BCC model which is called after Banker, Charnes, and Cooper, 1984. Both of the models are radial measures of efficiency and have two different types those are input-oriented model and output-oriented model. Input-oriented technical model attempts to reduce input quantities as much as feasible while maintaining current level of output, whereas output-oriented technical efficiency aims to maximise output levels using current level of inputs.

Different terminologies used in CCR and BCC Model

The input-oriented BCC model and the input-oriented CCR model, two of the most well-liked and frequently applied basic DEA models, were used in this study to estimate efficiencies. Pure technical efficiency (PTE) is measured by the BCC model, whereas overall technical efficiency (OTE) is measured by the CCR model. Scale efficiency (SE) is measured by OTE and PTE. SE equals OTE divided by PTE. Therefore, three types of efficiencies namely OTE, PTE, and SE can be found using the CCR and BCC models.

Overall Technical Efficiency or OTE, also known as CCR efficiency, is based on constant returns-to-scale (CRS). This concept measures the inefficiency resulting from an incorrect combination of input-output configuration, encompassing operational and scale inefficiency.

Pure Technical Efficiency or PTE also known as BCC efficiency under the variable returns-to-scale (VRS) where the assumption defines efficiency regardless of operating scale or inefficiency caused by managerial underperformance. Since the VRS frontier is closer to the piecewise boundary locations that are observed to be inefficient PTE, it is always greater than or equal to OTE. A DMU is said to be operating at the maximum productive scale size, or 100% scale efficiency, if it obtains perfect scores (100%) for both the CCR and BCC.

Scale Efficiency (SE) determines whether a DMU is in the appropriate size for operation. It is mainly the link between a company's production cost per unit and output volume. So, scale efficiency (SE) cannot be more than one and is calculated as the CCR score divided by the BCC score.

Mathematical Formulation of CCR and BCC Models:

CCR Model

Assumption has been made that there are n DMUs to evaluate [DMU_j (j = 1, 2, 3, 4, ..., n)]. DMUs [x_{ij} (i = 1, 2, 3, 4, ..., m)] consume m different inputs of identical character, resulting in s' different outputs of identical type for all DMUS [y_{rj} (r = 1, 2, 3, 4, ..., s)]. Assume x_{ij} and y_{rj} are positive (x_{ij} > 0 and y_{rj} > 0). Furthermore, each DMU is considered to have at least one positive input and one positive output value. Given the data, the efficiency of DMU_b can be measured using the following formulation.

$$\begin{aligned} & \text{Min } \theta_b - \varepsilon \left(\sum_{i=1}^m s_i^- + \sum_{r=1}^s s_r^+ \right) \\ & \text{Subject to } (\theta, \lambda_j, s_i^-, s_r^+) \end{aligned}$$

Subject to

$$\begin{aligned} & \sum_{j=1}^n x_{ij} \lambda_j + s_i^- = \theta_b x_{ib} \quad i = 1, 2, 3, 4, \dots, m. \\ & \sum_{j=1}^n y_{rj} \lambda_j - s_r^+ = y_{rb} \quad r = 1, 2, 3, 4, \dots, s \\ & \lambda_j \geq 0 \quad j = 1, 2, 3, 4, \dots, n \end{aligned}$$

$$s_i^-, s_r^+ \geq 0 \text{ for all } i \text{ and } r.$$

Where,

x_{ij} = Amount of input of 'i' utilized by the 'j'th DMU

y_{rj} = Amount of output of 'r' produced by the 'j'th DMU

x_{ib} = Amount of input of 'i' utilized by DMU_b

y_{rb} = Amount of output of 'r' produced by DMU_b

θ_b = efficiency score of DMU 'b' being evaluated

λ s represent the dual variables which identify benchmarks for inefficient units.

Slack variables: s_i^- (input slacks), s_r^+ (output slacks)

$\varepsilon > 0$ refers to a non-Archimedean element that is smaller than any real number and can be accommodated without specifying its value.

The input-oriented CCR model (envelopment or dual version) described above is utilised to estimate OTE in this study. The primal and dual DEA programs are relative. Multiplier or Primal DEA programs are those that use input and output weights. The DEA program that involves DMU weights is known as the Envelopment or Dual DEA program.

It is the reverse of the output maximising multiplier program. In the dual form, the maximum number of constraints is limited to the number of inputs and outputs, but in the primal form, the number of constraints is determined by the number of DMUs being assessed.

The mathematical program above calculates the efficiency score (θ) of a specific DMU_b. To obtain the efficiency score of other DMUs, the same procedure must be followed for each DMU, i.e., 'n' optimisations for each DMU_j. DMUs with $\theta = 1$ are inefficient, whereas those with $\theta = 1$ are efficient and on the frontier line. Some frontier or boundary points may be 'weekly efficient' because they have non-zero slacks in inputs and/or outputs.

BCC Model

The BCC model is a significant extension of the CCR concept. It evaluates technical efficiency rather than pure technical efficiency, indicating inefficiency caused by managerial underperformance. The BCC model differs to some extent from the CCR model with an additional constraint in the above mentioned CCR model. This constraint is known as convexity constraint. It evaluates the efficiency under VRS.

n

$$\sum_{j=1}^n \lambda_j = 1$$

j = 1

A DMU is BCC efficient if the optimal solution of the above two-phase procedure satisfies both the following conditions:

a) $\theta = 1$; and b) All slacks are zero.

DEA Input-Output Variables, Data Collection & Study Period

DEA Input-Output Variables Used

Selection of the input and output variables is the most vital stage to perform/run DEA model. The variables have an impact on the efficiency scores. To put it another way, changing the variables will cause the efficiency scores to vary while keeping the DMUs constant. It is determined by a variety of factors, including the study's objective and the accessibility of the data, among others. In the current study, DEA rankings for 50 DMUs are calculated one at a time using the "Stata 17" application. For the DEA analysis, the input variable is 1) Total Assets, and the two output variables are 1) OCF and 2) Net Sales.

Total Assets: The total assets of a company are defined as the sum of its current and non-current assets as of the last day of the accounting period.

Operating cash flow: The value of operating cash flow is calculated by subtracting all non-cash, non-operating expenses and incomes from the "net profit before tax and extra ordinary items," but before deducting cash inflow or outflow resulting from changes in working capital. Variations in working capital are always factored into the cash flow from operating activities. A rise in working capital results in cash constraints. Thus, when determining net cash from operating activities, an increase in working capital is regarded as a cash outflow. In a similar vein, cash is released whenever working capital drops. Therefore, when determining net cash from operating activities, a decrease in working capital is regarded as an inflow of cash.

Net Sales: Net sales are the total amount of money received from the sale of goods, non-financial services, mining, building, utilities (such as gas, electricity, and water), trading, employment, and after-sale services. It also includes any export income and fiscal benefits received by the companies.

Data Collection & Study Period

All the input output values are measured in terms of Indian rupees collected from Prowess database in merger and acquisition section from all the companies' merger between 01.04.2013-31.03,2014. Pre-merger input and output data are obtained after averaging five years annual data from the accounting year 2008-2009 to 2012-2013. Post-merger input and output data are obtained after averaging five years annual data from the accounting year 2014-2015 to 2018-2019 and the base year or merger year is considered as 2013-2014 (01.04.2013-31.03,2014) which is considered as zero.

Results and Discussions

DEA efficiency Score analysis:

This section examines and compares the substance of efficiency scores derived using CCR and BCC models before and after the merger. DEA scores are calculated using 'Stata 17' software. Table I illustrates OTE and its two components, PTE and SE, for each of the 50 DMUs. Efficiency scores are calculated to two decimals. According to the table, 23 DMUs experienced efficiency gains and 26 DMUs experienced efficiency declines during the post-merger time in comparison to the pre-merger time, and 1 DMU remained unchanged from a CCR perspective after the merger, indicating that inefficiency increased in the post-merger time due to an incorrect input-output mix.

Table-1: Efficiency Scores and RTS of the Companies

SRL NO.	DMU	PRE-MERGER				POST-MERGER			
		OTE	PTE	SE	RTS	OTE	PTE	SE	RTS
1	A I A Engineering Ltd.	92.10%	92.11%	99.99%	1	97.75%	97.75%	100.00%	1
2	A P L Apollo Tubes Ltd.	85.20%	85.31%	99.87%	1	100.00%	100%	100.00%	0
3	Allcargo Gati Ltd.	41.76%	41.77%	99.98%	1	21.80%	21.80%	99.99%	1
4	Ambuja Cements Ltd.	89.55%	100.00%	89.55%	-1	44.19%	44.19%	100.00%	1
5	Ashok Leyland Ltd.	52.80%	71.09%	74.27%	-1	100.00%	100%	100.00%	-1
6	Aurionpro Solutions Ltd.	38.84%	39.21%	99.06%	1	44.52%	44.52%	99.99%	1
7	Balkrishna Industries Ltd.	83.50%	83.66%	99.81%	-1	100.00%	100%	100.00%	0
8	Bharti Airtel Ltd.	79.80%	100.00%	79.80%	-1	100.00%	100%	100.00%	-1
9	Birla Corporation Ltd.	63.48%	63.55%	99.89%	-1	32.27%	32.27%	100.00%	-1
10	Birlasoft Ltd.	71.16%	71.25%	99.87%	1	73.75%	73.75%	100.00%	1
11	C G Power & Indl. Solutions Ltd.	99.16%	100.00%	99.16%	-1	31.39%	31.39%	99.99%	-1
12	Delta Corp Ltd.	37.71%	37.93%	99.42%	1	42.32%	42.32%	100.00%	1
13	E I D-Parry (India) Ltd.	29.97%	30.24%	99.11%	-1	28.09%	28.09%	100.01%	-1
14	Glenmark Pharmaceuticals Ltd.	43.66%	43.68%	99.95%	1	67.23%	67.23%	100.00%	-1
15	Godrej Agrovet Ltd.	100.00%	100.00%	100.00%	0	91.76%	91.76%	100.00%	-1
16	Granules India Ltd.	70.73%	70.84%	99.84%	1	72.90%	72.90%	100.00%	1
17	Grindwell Norton Ltd.	94.53%	94.58%	99.95%	1	94.82%	94.82%	100.00%	1
18	Hindustan National Glass & Inds. Ltd.	40.04%	41.57%	96.32%	1	64.03%	64.03%	100.00%	1
19	Hindustan National Glass & Inds. Ltd.	44.79%	44.91%	99.73%	-1	30.08%	30.08%	99.99%	-1
20	India Cements Ltd.	46.79%	46.91%	99.74%	-1	37.11%	37.11%	99.99%	1
21	J T E K T India Ltd.	76.34%	76.96%	99.19%	-1	93.63%	93.63%	100.00%	1
22	Macrotech Developers Ltd.	14.39%	14.45%	99.58%	1	52.57%	52.57%	100.00%	-1
23	Mahindra Holidays & Resorts India Ltd	37.64%	37.71%	99.81%	1	27.35%	27.35%	100.01%	1
24	Maruti Suzuki India Ltd.	74.07%	100.00%	74.07%	-1	100.00%	100%	100.00%	0
25	Mphasis Ltd.	100.00%	100.00%	100.00%	0	74.58%	74.58%	100.00%	1
26	P I Industries Ltd.	82.40%	82.42%	99.98%	1	80.48%	80.48%	100.00%	1
27	P V R Inox Ltd.	47.99%	48.10%	99.77%	1	81.45%	81.45%	100.00%	1
28	Peninsula Land Ltd.	39.10%	39.14%	99.90%	1	2.93%	2.93%	99.93%	1
29	Pfizer Ltd.	47.02%	47.04%	99.96%	1	64.96%	64.96%	100.01%	1
30	Polo Queen Indl. & Fintech Ltd.	24.60%	27.60%	89.13%	1	18.15%	18.15%	100.00%	1
31	Polycab India Ltd.	70.20%	78.89%	88.98%	-1	92.65%	92.65%	100.00%	-1
32	Rane (Madras) Ltd.	89.43%	89.65%	99.75%	1	87.65%	87.65%	100.00%	1
33	Reliance Infrastructure Ltd.	23.92%	28.45%	84.08%	-1	19.35%	19.35%	99.99%	-1
34	Restile Ceramics Ltd.	11.92%	13.08%	91.13%	1	22.24%	22.24%	100.02%	1
35	Sandhar Technologies Ltd.	100.00%	100.00%	100.00%	0	100.00%	100%	100.00%	0
36	Simbhaoli Sugars Ltd.	15.50%	15.94%	97.24%	1	16.74%	16.74%	100.02%	1
37	Smiths & Founders (India) Ltd.	36.77%	100.00%	36.77%	1	100.00%	100%	100.00%	1
38	Steel Exchange India Ltd.	64.73%	64.99%	99.60%	-1	39.33%	39.33%	99.99%	1
39	Sunteck Realty Ltd.	9.45%	9.79%	96.53%	1	36.34%	36.34%	99.99%	1
40	Syngene International Ltd.	76.49%	76.72%	99.70%	1	75.76%	75.76%	100.01%	1
41	Tata Consumer Products Ltd.	24.39%	25.56%	95.42%	-1	45.05%	45.05%	99.99%	-1
42	Tata Steel Ltd.	54.29%	67.65%	80.25%	-1	95.30%	95.30%	100.00%	-1
43	Tech Mahindra Ltd.	89.59%	94.20%	95.11%	-1	92.89%	92.89%	100.00%	-1
44	Tilaknagar Industries Ltd.	52.76%	52.91%	99.72%	1	15.92%	15.92%	99.99%	1
45	Tribhovanadas Bhimji Zaveri Ltd.	100.00%	100.00%	100.00%	0	60.62%	60.62%	100.00%	1
46	Trident Ltd.	60.73%	61.05%	99.48%	-1	69.41%	69.41%	99.99%	1
47	United Spirits Ltd.	46.50%	47.97%	96.94%	-1	42.59%	42.59%	99.99%	-1
48	Wipro Ltd.	81.05%	100.00%	81.05%	-1	81.97%	81.97%	99.99%	-1
49	Zee Media Corp. Ltd.	68.99%	69.17%	99.74%	1	50.36%	50.36%	100.00%	1
50	Zydus Lifesciences Ltd.	67.78%	67.78%	100.00%	1	66.86%	66.86%	100.00%	-1

Source: Data collected from Prowess IQ and compiled by the Authors using STATA17 Software

Where, 1= IRS = Increasing Return-to-scale, 0= CRS = Constant Return-to-scale, -1= DRS =Decreasing return-

to-scale.

Efficient and Inefficient Companies:

The DMUs are divided into two categories using the DEA methodology: efficient (efficiency score = 1 or 100%) DMUs and inefficient (efficiency score < 1) DMUs. Accordingly, based on their CCR and BCC efficiency scores, 50 chosen DMUs are divided into efficient and inefficient categories in this section. Three groups comprise the companies (Table-II). It is discovered that only one company (Sandhar Technologies Ltd.) is completely technical and scale efficient in both pre-merger time and post-merger time. In the pre-merger time Godrej Agrovet Ltd., Mphasis Ltd. & Tribhovandas Zaveri Ltd. are both technical and scale efficient DMUs and DMUs like Ambuja Cements Ltd., Bharti Airtel Ltd., C G Power & Indl. Solutions Ltd., Maruti Suzuki India Ltd., Smiths & Founders (India) Ltd., Wipro Ltd. are found to be technical Efficient but not Scale Efficient.

In the post-merger period APL apollo Tubes Ltd., Ashok Leyland Ltd., Balkrishna Industries Ltd., Bharti Airtel Ltd., Maruti Suzuki India Ltd., Smiths & Founders (India) Ltd. are found as technical and scale efficient DMUs and other 34 DMUs are both technical and scale inefficient.

Table-2: Efficient and Inefficient Companies in Pre and Post Merger

Efficiency	Both in Pre and Post-merger	Only in Pre -merger	Only in Post- merger
Both Technical and Scale Efficient DMUs PTE = SE=1 i.e. OTE=1	1. Sandhar Technologies Ltd.	Godrej Agrovet Ltd. Mphasis Ltd. Tribhovandas Bhimji Zaveri Ltd.	APL apollo Tubes Ltd. Ashok Leyland Ltd. Balkrishna Industries Ltd. Bharti Airtel Ltd. Maruti Suzuki India Ltd. Smiths & Founders (India) Ltd.
Technical Efficient but not Scale Efficient DMUs PTE = 1, SE <1 i.e. OTE < 1	None	Ambuja Cements Ltd. Bharti Airtel Ltd. C G Power & Indl. Solutions Ltd. Maruti Suzuki India Ltd. Smiths & Founders (India) Ltd. Wipro Ltd.	None
Both Technical and Scale Inefficient DMUs OTE<1, PTE < 1, SE <1	34 companies		

Data collected from Prowess IQ and compiled by the Authors using STATA17 Software

Scale Analysis:

In case of several sample companies, scale inefficiency has an impact on overall technical efficiency. The issue of scale inefficiencies is explained by examining the companies' returns-to-scale (RTS) in before and after the merger periods. The details of returns-to-scale is provided in Table III for each of the DMU where it is found that in pre-merger period 26 DMUs are operating in increasing returns to scale, 4 DMUs are operating in constant returns to scale and 20 DMUs are operating in decreasing returns to scale but after the merger 29 DMUs are operating in increasing returns to scale, 4 DMUs are operating in constant returns to scale which is same before the merger and 17 DMUs are operating in decreasing returns to scale. DRS is the primary cause of scale inefficiency in both the pre- merger time and post-merger time. However, the number has reduced in the post-merger time. The reason for such DRS could be unregulated asset management by the companies. As a result, these organisations' greatest option for improving OTE is to make effective use of their assets. The findings show that most DMUs continue to operate at the improper scale even after mergers, though the number has declined in the post-merger period.

Table-3: DMUs and its Returns-to-Scale during Pre and Post-Merger period

Returns to Scale	Pre-merger	Post-merger
Number of DMUs in IRS	26	29
Number of DMUs in CRS	4	4
Number of DMUs in DRS	20	17
Total	50	50

Source: Data collected from Prowess IQ and compiled by the Authors using STATA17 Software

Where, RTS = Returns-to-scale, IRS (1) = Increasing Returns-to-scale, CRS (0) = Constant Returns-to-scale, DRS (-1) =Decreasing returns-to-scale.

Analysis of Ranking of the DMUs:

Ranking method is a common strategy in DEA. In this study, rankings were based on PTE score. By evaluating the ranking of the selected DMUs shown in table IV, it can be inferred that certain companies that were less efficient before a merger showed improved efficiency after the merger, while others with higher efficiency before the merger experienced a decrease in efficiency afterward. This table also shows that the DMUs with the same PTE received the same rank. For example, during the pre-merger time period, rank 1 was allocated to 10 DMUs based on this approach, and the second ranked DMU was given rank 11 because there were 10 DMUs in rank 1. During the post-merger period, 6 DMUs were assigned rank 1 based on this approach. However, because rank 1 has 6 DMUs, the second-ranked DMU has been assigned rank 7.

Table-4: Ranking of companies Pre and Post the Merger

DMUs	Pre-merger Rank	Post-merger Rank
A I A Engineering Ltd.	13	8
A P L Apollo Tubes Ltd.	15	1
Allcargo Gati Ltd.	37	45
Ambuja Cements Ltd.	1	33
Ashok Leyland Ltd.	22	1
Aurionpro Solutions Ltd.	39	32
Balkrishna Industries Ltd.	16	1
Bharti Airtel Ltd.	1	7
Birla Corporation Ltd.	28	39
Birlasoft Ltd.	21	21
C G Power & Indl. Solutions Ltd.	1	40
Delta Corp Ltd.	41	35
E I D-Parry (India) Ltd.	43	42
Glenmark Pharmaceuticals Ltd.	36	24
Godrej Agrovet Ltd.	1	14
Granules India Ltd.	23	22
Grindwell Norton Ltd.	11	10
Hindustan Mills Ltd.	38	27
Hindusthan National Glass & Inds. Ltd.	35	41
India Cements Ltd.	34	37
J T E K T India Ltd.	19	11
Macrotech Developers Ltd.	48	29
Mahindra Holidays & Resorts India Ltd.	42	43
Maruti Suzuki India Ltd.	1	1
Mphasis Ltd.	1	20

DMUs	Pre-merger Rank	Post-merger Rank
P I Industries Ltd.	17	18
P V R Inox Ltd.	31	17
Peninsula Land Ltd.	40	50
Pfizer Ltd.	33	26
Polo Queen Indl. & Fintech Ltd.	45	47
Polycab India Ltd.	18	13
Rane (Madras) Ltd.	14	15
Reliance Infrastructure Ltd.	44	46
Restile Ceramics Ltd.	49	44
Sandhar Technologies Ltd.	1	1
Simbhaoli Sugars Ltd.	47	48
Smiths & Founders (India) Ltd.	1	1
Steel Exchange India Ltd.	27	36
Sunteck Realty Ltd.	50	38
Syngene International Ltd.	20	19
Tata Consumer Products Ltd.	46	31
Tata Steel Ltd.	26	9
Tech Mahindra Ltd.	12	12
Tilaknagar Industries Ltd.	30	49
Tribhovandas Bhimji Zaveri Ltd.	1	28
Trident Ltd.	29	23
United Spirits Ltd.	32	34
Wipro Ltd.	1	16
Zee Media Corp. Ltd.	24	30
Zydus Lifesciences Ltd.	25	25

Source: Data collected from Prowess IQ and compiled by the Authors using STATA17 Software

Super-efficiency analysis:

Due to inconsistency in the results to allocate specific ranks to the DMUs through STATA Software again the PTE scores were analyzed in another software that is EMS in Table V where specific ranking is allocated to the DMUs in both pre-merger time and post-merger time. It is found that after the merger 22 DMUs improved their efficiency to control their asset management, 4 DMUs remain same in both the pre-merger time and post-merger time and 24 DMUs could not control their asset management after the merger.

Table-5: Ranking of companies before and After the Merger (With Super efficiency)

DMUs	Pre-merger Rank	Post-merger Rank	DMUs	Pre-merger Rank	Post-merger Rank
A I A Engineering Ltd.	8	13	P I Industries Ltd.	18	17
A P L Apollo Tubes Ltd.	4	15	P V R Inox Ltd.	17	31
Allcargo Gati Ltd.	45	37	Peninsula Land Ltd.	50	40
Ambuja Cements Ltd.	33	9	Pfizer Ltd.	26	33
Ashok Leyland Ltd.	7	22	Polo Queen Indl. & Fintech Ltd.	47	45
Aurionpro Solutions Ltd.	32	39	Polycab India Ltd.	13	18
Balkrishna Industries Ltd.	5	16	Rane (Madras) Ltd.	15	14
Bharti Airtel Ltd.	1	1	Reliance Infrastructure Ltd.	46	44
Birla Corporation Ltd.	39	28	Restile Ceramics Ltd.	44	49
Birlasoft Ltd.	21	21	Sandhar Technologies Ltd.	6	10
C G Power & Indl. Solutions Ltd.	40	5	Simbhaoli Sugars Ltd.	48	47
Delta Corp Ltd.	35	41	Smiths & Founders (India) Ltd.	3	2
E I D-Parry (India) Ltd.	42	43	Steel Exchange India Ltd.	36	27
Glenmark Pharmaceuticals Ltd.	24	36	Suntech Realty Ltd.	38	50
Godrej Agrovet Ltd.	14	4	Syngene International Ltd.	19	20
Granules India Ltd.	22	23	Tata Consumer Products Ltd.	31	46
Grindwell Norton Ltd.	10	11	Tata Steel Ltd.	9	26
Hindustan Mills Ltd.	27	38	Tech Mahindra Ltd.	12	12
Hindusthan National Glass & Inds. Ltd.	41	35	Tilaknagar Industries Ltd.	49	30
India Cements Ltd.	37	34	Tribhovandas Bhimji Zaveri Ltd.	28	7
J T E K T India Ltd.	11	19	Trident Ltd.	23	29
Macrotech Developers Ltd.	29	48	United Spirits Ltd.	34	32
Mahindra Holidays & Resorts India Ltd.	43	42	Wipro Ltd.	16	8
Maruti Suzuki India Ltd.	2	3	Zee Media Corp. Ltd.	30	24
Mphasis Ltd.	20	6	Zydus Lifesciences Ltd.	25	25

Source: Data collected from Prowess IQ and compiled by the Authors using EMS Software

Findings of the Study

It is evident that as per OTE i.e., CCR efficiency, 23 DMUs have experienced efficiency gain and 26 DMUs have experienced decline in efficiency during post-merger time as compared to pre-merger time and 1 DMU remain unaltered after the merger which indicates that after the merger inefficiency increases due to wrong input-output mix in post-merger period.

Evident results found from Table: II that number of technical and scale efficient DMUs increases in the post-merger period (6 DMUs) in comparison with pre-merger period (3 DMUs). Scale of operations improved slightly after the merger which is shown in Table: III which depicts improvements in the scale efficiencies.

It is also found from Table: III that most DMUs continue to operate at the improper scale even after mergers, though the number has declined in the post-merger era.

In the Ranking method after the inconsistent result in the STATA 17 software it is found that some organisations with lower efficiency levels during the pre-merger period had greater efficiency levels in the post-merger period, and vice versa. After inconsistency in the ranking in Table: IV, super-efficiency score is calculated by EMS software which depicts (Table: V) that after the merger 22 DMUs improved their efficiency, i.e., those DMUs control their asset management in efficient manner, position in 4 DMUs remain same in both the pre and post-merger period and 24 DMUs could not control their asset management after the merger.

Overall, it is found that CCR efficiency decreases in post-merger period. Number of efficient companies increases in post-merger period based on their CCR and BCC scores, Scale efficiency increases in post-merger period. Ranking of the individual companies decreases in post-merger period in comparison with pre-merger period.

Limitations of the Study

Key restriction of this study is that it was conducted on using a sample of 50 DMUs from the BSE database that belongs from Indian stock market for a certain accounting year, starting from 1 April 2013 to 31 March 2014. Secondly, more input-output mix/ combinations may provide a broader understanding of the input-oriented result. Consideration of an output-oriented mix can also explain maximisation of net sales and/or OCF.

Scope for Further Research

In this research paper data of acquirer companies that are listed in BSE are analysed. If more data were gathered from different stock exchange over a long time, then results may be much more exploratory and enticing. The output-oriented maximisation theory is not explored here. In the future, if the analysis will conduct on more companies over a longer period in varied database or stock markets, such as the NSE, with diverse input-output mixes then there is an ideal chance to see a variety of findings.

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Evolving Trends: The Impact of Information Technology on Everyday Library Usage

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Abstract

In today's digital age, libraries are experiencing a, including the rise of online resources, digital libraries, and mobile technologies, this profound transformation in the way they deliver services and engage with patrons. This paper explores the changing landscape of information technology and its effect on the daily operations and usage patterns of libraries. Through an analysis of recent trends and developments study aims to highlight the evolving role of libraries in facilitating access to information in an increasingly interconnected world.

Drawing upon a comprehensive review of existing literature and case studies, the paper examines how libraries have adapted their services and infrastructure to meet the evolving needs and preferences of users. It investigates the shift towards digital collections, the integration of cutting-edge technologies such as artificial intelligence and machine learning, and the emergence of new modes of interaction between patrons and library staff.

Furthermore, this paper discusses the challenges and opportunities presented by these changing trends, including issues related to digital literacy, information access, and privacy concerns. By analyzing the impact of information technology on everyday library use, this research seeks to provide insights into how libraries can continue to serve as vital community hubs in an era of rapid technological advancement.

This paper underscores the importance of ongoing innovation and adaptation in libraries to ensure they remain relevant and responsive to the evolving information needs of their users. Through strategic investment in technology and a commitment to user-centered design, libraries can continue to fulfill their mission of providing equitable access to information and knowledge for all members of society.

Keywords: Information Technology, Libraries, Everyday Use, New IT Trends, Impact on library usage

Introduction

In this IT era, marked by the rapid evolution of information technology, libraries are undergoing significant transformations in their daily operations and interactions with users. The explosion of digital resources, advancements in communication technologies, and changing user preferences have all contributed to reshaping the role of libraries in society. This preface sets the stage for exploring the dynamic landscape of library usage in the face of evolving information trends.

Libraries have long been regarded as repositories of knowledge, serving as hubs for learning, research, and community engagement. However, with the advent of the digital age, the traditional functions of libraries have expanded beyond their physical limitations. Today, libraries are not only physical spaces housing books and periodicals but also virtual gateways to vast repositories of digital information accessible from anywhere with an internet connection.

The transition towards digitalization has revolutionized the way people access and interacts with information. Online databases, e-books, and multimedia resources have become integral components of library collections, offering patrons unprecedented opportunities to explore diverse topics and perspectives. Moreover, the proliferation of Smartphone, tablets, and other mobile devices has enabled users to access library resources on the go, blurring the boundaries between traditional and digital library services.

Amidst these changes, libraries are faced with the dual challenge of meeting the evolving needs of their patrons while navigating the complexities of an increasingly digital landscape. From enhancing digital literacy skills to ensuring equitable access to information for all members of society, libraries play a crucial role in bridging the digital divide and promoting lifelong learning.

This paper aims to explore the changing trends in information technology and their impact on everyday library usage. By examining recent developments, challenges, and opportunities in the field, we seek to gain insights into how libraries can adapt and innovate to remain relevant in the digital age. Through a comprehensive analysis of literature, case studies, and empirical research, we aim to shed light on the dynamic interplay between technology and libraries and its implications for the future of information access and dissemination.

New Trends in Information Generation and Access:

In the ever-evolving landscape of information technology, several notable trends are shaping the generation and access of information. These trends reflect advancements in technology, changes in user behavior, and the evolving nature of information itself. Understanding these trends is crucial for libraries and information professionals to effectively meet the needs of their patrons and stay abreast of developments in the field. Here are some key trends:

Big Data and Data Analytics: With the exponential growth of digital data, organizations are increasingly leveraging big data analytics to extract valuable insights and make data-driven decisions. This trend extends to libraries, where data analytics tools are being used to analyze usage patterns, improve collection development strategies, and personalize services for patrons.

Artificial Intelligence (AI) and Machine Learning: AI and machine learning technologies are revolutionizing how information is processed, organized, and accessed. In libraries, AI-powered chatbots and virtual assistants are being deployed to provide instant assistance to users, while machine learning algorithms are used to enhance search and recommendation systems, making it easier for patrons to discover relevant resources.

Open Access and Open Science: There is a growing movement towards open access publishing and open science initiatives, aimed at making research outputs freely accessible to the public. Libraries are playing a central role in supporting open access by facilitating the dissemination of scholarly publications, advocating for open access policies, and providing platforms for hosting institutional repositories.

Remote Access and Mobile Technologies: The proliferation of mobile devices and ubiquitous internet connectivity has transformed how users access information. Libraries are adapting to this trend by offering mobile-friendly interfaces, developing apps for accessing library resources, and providing remote access to digital collections, ensuring that patrons can engage with library services anytime, anywhere.

Digital Humanities and Computational Research: Digital humanities and computational research methods are gaining prominence in academia, allowing scholars to explore large-scale datasets and conduct innovative interdisciplinary research. Libraries are embracing this trend by offering support for digital scholarship initiatives, providing access to specialized tools and resources, and facilitating collaborations between researchers from different disciplines.

Privacy and Ethical Considerations: As concerns about data privacy and ethics continue to mount, there is a growing emphasis on ensuring the responsible use of information technologies. Libraries are proactively addressing these concerns by implementing privacy-enhancing technologies, advocating for user privacy rights, and promoting ethical guidelines for data management and use.

These trends underscore the dynamic nature of information generation and access in the digital age, presenting both opportunities and challenges for libraries and information professionals. By staying attuned to these trends and embracing innovative approaches, libraries can continue to fulfill their mission of providing equitable access to information and supporting lifelong learning in diverse communities.

The evolving trends in information generation and access have a profound impact on the physical usage of libraries. While the digital age has transformed the way users access information, it has also reshaped the role and function of physical library spaces. Here are some ways in which these trends affect library physical usage:

Digital Curation and Collection Development: Libraries can employ rigorous digital curation practices to selectively acquire, organize, and maintain digital resources that align with their collection development policies and the needs of their users. By focusing on high-quality, authoritative content, libraries can ensure that their digital collections remain relevant and valuable to patrons amidst the abundance of online information.

Information Literacy Education: Empowering patrons with information literacy skills is crucial for navigating the vast sea of digital information effectively and responsibly. Libraries can offer workshops, training sessions, and online tutorials to teach users how to critically evaluate information, distinguish between reliable and unreliable sources, and ethically use digital resources.

Personalized Recommendation Services: Leveraging technology such as machine learning algorithms, libraries can develop personalized recommendation services that suggest relevant resources to users based on their interests, preferences, and past usage patterns. By tailoring recommendations to individual users, libraries can help patrons discover new digital resources that meet their specific information needs.

Partnerships and Collaborations: Collaborating with other libraries, educational institutions, publishers, and technology companies can help libraries expand their digital offerings, share resources, and leverage economies of scale to overcome the challenges of digital information overload. Partnerships can also facilitate access to specialized digital collections and services that may be beyond the scope of individual libraries.

User-Centered Design: Adopting a user-centered approach to digital service design can enhance the usability and accessibility of library digital platforms and resources. Libraries should solicit feedback from users, conduct usability testing, and iteratively improve their digital interfaces to ensure that they meet the needs and preferences of diverse user groups.

Promotion of Open Access and Open Educational Resources (OER): Supporting open access publishing and the use of OER can help libraries expand access to scholarly information and educational materials while mitigating the costs associated with traditional subscription-based models. Libraries can advocate for open access policies, provide guidance on copyright and licensing issues, and host institutional repositories to disseminate scholarly works produced by their communities.

Continuous Professional Development: Library staff need to stay informed about emerging trends and best practices in digital librarianship through continuous professional development activities such as workshops, conferences, and online courses. Equipping library professionals with the knowledge and skills they need to navigate the digital landscape effectively is essential for addressing the challenges of digital information explosion.

By adopting a multifaceted approach that combines digital curation, information literacy education, technology integration, collaboration, and professional development, libraries can overcome the challenges posed by the digital information explosion and continue to fulfill their mission of providing equitable access to information in the digital age.

The challenges presented by the digital information explosion are significant but not insurmountable for libraries. By adopting proactive strategies and embracing innovation, libraries can effectively navigate the complexities of the digital landscape and continue to serve as vital resources for their communities. There are some key observations include:

Adaptation to Technological Change: Libraries must adapt to the rapid pace of technological change by embracing digital transformation and integrating technology into their services and operations. This includes digitizing collections, offering online access to resources, and leveraging digital tools for information management and dissemination.

Promotion of Digital Literacy: Digital literacy education is essential for empowering patrons to navigate the abundance of digital information critically and responsibly. Libraries play a crucial role in providing digital literacy training and resources to help users develop the skills they need to effectively find, evaluate, and use digital information.

Collaboration and Partnerships: Collaboration and partnerships with other libraries, educational institutions, publishers, and technology companies can enhance libraries' capacity to address the challenges of digital information overload. By sharing resources, expertise, and best practices, libraries can leverage collective efforts to expand access to digital resources and services.

User-Centered Approach: Libraries should adopt a user-centered approach to design and service delivery, ensuring that digital platforms and resources are tailored to meet the diverse needs and preferences of their patrons. Soliciting feedback from users, conducting usability testing, and continuously improving digital interfaces are essential for enhancing user satisfaction and engagement.

Advocacy for Open Access: Libraries can advocate for open access publishing and the use of open educational resources to expand access to information while promoting equitable and sustainable models of knowledge dissemination. By advocating for open access policies, supporting the creation and dissemination of open content, and providing guidance on copyright and licensing issues, libraries can contribute to a more inclusive and accessible information ecosystem.

Libraries have a critical role to play in addressing the challenges posed by the digital information explosion and ensuring that all members of society have equitable access to information in the digital age. Through proactive adaptation, collaboration, and advocacy, libraries can continue to fulfill their mission of promoting lifelong learning, intellectual freedom, and access to knowledge for all.

Libraries offer a wealth of online facilities for information access, catering to the evolving needs of patrons. Here are some common online resources and services available through libraries:

Digital Libraries: Many libraries provide access to digital collections of eBooks, audio books, academic papers, and historical documents. These resources can often be accessed remotely using library cards or institutional logins.

Online Catalogs: Libraries maintain online catalogs where users can search for physical and digital resources available in the library's collection. These catalogs often include advanced search options and filters to help users find materials efficiently.

Databases and Research Tools: Libraries subscribe to various databases covering a wide range of subjects, including academic journals, newspapers, magazines, and specialized collections. These databases provide access to scholarly articles, reference materials, and other research resources.

Reference Services: Many libraries offer online reference services, allowing patrons to ask questions, seek research assistance, or request help finding specific information. These services may include live chat, email support, or virtual reference desks staffed by librarians.

Online Learning Platforms: Libraries may provide access to online learning platforms and educational resources, such as language learning programs, skill development courses, and test preparation materials.

Interlibrary Loan Services: Through interlibrary loan services, patrons can request materials not available in their local library's collection. Many libraries facilitate interlibrary loan requests online, making it easier for users to access a broader range of resources.

Digital Archives and Special Collections: Libraries often digitize unique materials from their collections, such as rare books, manuscripts, photographs, and oral histories. These digital archives and special collections can be accessed online, allowing users to explore valuable cultural and historical resources.

Library Websites and Portals: Library websites serve as gateways to online resources and services, providing information about library hours, policies, events, and online tools. Users can often access library resources, manage their accounts, and renew materials through library websites or online portals.

Libraries continue to adapt and expand their online offerings to meet the needs of patrons in the digital age, ensuring access to information and resources regardless of location or physical presence

Conclusion:

The digital information explosion presents both challenges and opportunities for libraries in the modern era. As technology continues to evolve rapidly, libraries must adapt to meet the changing needs and preferences of their patrons while navigating the complexities of the digital landscape. Despite these challenges, libraries are well-positioned to play a central role in promoting access to information, fostering digital literacy, and supporting lifelong learning in diverse communities.

By embracing digital transformation, adopting a user-centered approach, and leveraging collaboration and partnerships, libraries can effectively overcome the challenges posed by the digital information explosion. Through proactive strategies such as digital curation, information literacy education, and advocacy for open access, libraries can continue to serve as vital resources for their communities, providing equitable access to information and promoting intellectual freedom and discovery.

As we look to the future, it is clear that libraries will remain essential institutions in the digital age, serving as trusted guardians of knowledge and culture. By embracing innovation, embracing change, and staying true to their mission of serving the public good, libraries can continue to thrive and evolve as dynamic hubs for learning, creativity, and community engagement in the 21st century and beyond.

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Green HRM and Organisational Sustainability- A Conceptual Framework for Strategic Fit

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Abstract

Purpose– Green human resource management (HRM) is attracting much attention from practitioners and scholars worldwide. The present study offers a thorough literature review to fill a gap in having a conceptual framework of the strategic fit of Green HRM and organizational sustainability. This paper's goals are to:

- To understand the concept of Green HRM from various perspectives, methodologies, and contexts.
- Establish the key areas of concern for green HRM.
- Recognise the relationship between organisational sustainability and green HRM.
- Outline a strategic fit approach.

Design/methodology/approach– The study employs a methodical approach to literature review. Eight Green HRM focal areas drawn from the body of existing literature have been utilised to divide up the articles that were selected.

Findings– Over the previous 12 years, there has been an enormous spike in research having a special focus on Green HRM. Fifty articles in all underwent review. Most of these studies used quantitative research techniques and were conducted in underdeveloped nations. However, gaps were identified regarding having a conceptual framework of Green HRM and organizational sustainability in terms of a strategic fit.

Limitation of The Paper– This paper's subject is restricted to examining scholarly works based on an online search in peer-reviewed credible publications using the terms Green Human Resource, Green Recruitment, Green Performance Management, Green Compensation and Reward, and Green Training and Development. During the review of the paper, the researcher has excluded other academic materials like books and conference papers.

Originality/value– The study gives a structural overview of publications between 2010 and early 2023. To understand the paradoxes of sustainability and its strategic fit approach, the researchers have considered articles published before 2010. This review delivers an improved comprehension of the status of recent research, trends, and possible future directions in the area of green human resource management.

Keywords: Green human resource management, green training and development, green recruitment.

Introduction

Organisations are incorporating pro-environmental behaviours and activities at greater rates in response to growing global environmental concerns thus helping these organisations become more viable and sustainable. Green management practices strengthen employee awareness of environmental issues and open avenues for their overall growth as professionals. Green human resource management refers to selecting suitable workers with a proper blend of expertise in sustainable development and awareness of topics like having a sustainable world and making optimum use of limited resources. Performance appraisal, personal development, and selection are some of the areas where green HRM practices are developed and put into practice. Transforming HR procedures to embrace green initiatives whenever feasible and turning them into a routine that aligns with strategic policies is necessary. Blended green initiatives are part of corporate social responsibility (CSR) and human resources practices. A significant number of organisations should take the lead in implementing green initiatives in their strategic policy-making and HR functional departments. Global corporations are more willing to adopt green initiatives throughout their organisations than create new workspaces.

Therefore, by first looking at the direct impacts of GHRM on organisation sustainability and then looking into the indirect mechanism through which GHRM can influence sustainability, this research seeks to fill in the gaps in

the literature. In this regard, the present study offers a thorough literature review to fill a gap in having a conceptual framework of strategic fit of Green HRM and Organizational Sustainability. This paper's objectives are to:

- To understand the concept of Green HRM from various perspectives, methodologies, and contexts.
- Establish the key areas of concern for green HRM.
- Recognise the relationship between organisational sustainability and green HRM.
- Outline a strategic fit approach.

Green HRM has been the primary emphasis of this study, which is based on an evaluation of the literature. Fifty articles in all were reviewed. Almost all of these studies used quantitative research techniques and took place in underdeveloped countries. However, gaps were identified regarding having a conceptual framework of Green HRM and organizational sustainability. The findings of such literature help in identifying opportunities for comprehending organisational complexity and developing proactive and beneficial techniques for managing tensions to advance the sustainability of the company and its HRM systems. The researchers presented the key features of the paradox perspective, related it with HRM theories, and discussed how it can guide future research on tensions in HRM from a novel paradox perspective.

Green HRM incorporates ecological sustainability standards with performance management, training and development, recruiting and selection, and reward systems for organisations (Renwick, 2008). Green HR initiatives enhance work efficiency, cut operating costs, and improve employee engagement as well as retention. By minimising carbon footprints, these benefits contribute to the creation of organisational sustainability and competitive advantages (Geetu, 2014). It has the power to satisfy the needs of prospective customers while considering the needs of future generations. A company's approach that generates value in line with the long-term preservation, maintenance, and enhancement of the financial, environmental, and social capital is referred to as sustainable growth. A study was conducted to investigate the link between HR factors and the perceived ecological performance of employees in different business organisations. The outcomes of the research suggested that companies carry out energy audits, enforce paperless processes, recycle, and encourage their employees to make contributions to greener practices and organisational sustainability (Kozica, 2012). An organisation with an eco-aware workforce tends to make more inspired decisions, have a tighter budget, and have higher employee retention (Paallavi, 2016). One of the most pressing social concerns nowadays is environmental conservation (Hahn, 2014). The conventional HRM functions have been replaced by online HRM activities due to digitalization and e-human resource management, which has made the corporate world faster and more efficient. In addition to expecting the best and quickest return on investment, businesses engaging in green initiatives and corporate social responsibility (CSR) also promote other advantages like reduced production costs, enhanced productivity, and higher profitability (Roy & Khastagir, 2016). Higher GHRM practice levels have been linked to increased profitability (Obeidat, 2018), financial performance of the enterprises (Perramon, 2014; Miroshnychenko, 2017), and efficiency. These findings strengthen the economic pillar of sustainability. However, it has been determined from the literature that rewards, performance, job description, and green selection were not found to be important factors. According to Opata and Arulrajah (2014), the term "green HRM" refers to any HRM activity that minimises carbon emissions. Examples of such practices encompass the creation and analysis of green jobs, green HR approach, green hiring and selection, onboarding, training, growth, green appraisal of performance, green compensation, and employee relations. According to Chaudhary (2018), an organization's ability to successfully carry out GHRM depends on how well its people incorporate their environmental competencies with social requirements, organisational objectives, and ecological considerations.

The idea of GHRM has a major impact on HRM processes and procedures related to employee behaviour, organisational operations, green staffing, and strategic management. HR planning, job analysis, and work design are the first steps towards implementing GHRM. Employee relations and strategic HRM are the subsequent steps in the HRM components. The biggest hurdle for HR professionals is having an in-depth comprehension of GHRM along with how to use it in the real world for transforming their companies into green organisations.

Enterprises eventually perform better ecologically as a result of this possible endeavour. This study is undertaken to explore the principles, requirements, advantages, procedures, and difficulties that HR professionals and management encounter while implementing GHRM within an organisation.

Definitional Perspectives of Green HRM

To put organisational practices into context, it is important to comprehend the range of definitions and indicative descriptions related to green human resource management. Table 1 displays a few typical definitions of Green Human Resource Management (GHRM) that were found in the literature review.

Table:1

Kozica & Kaiser, 2012	They observed that flexible HRM depends on several frameworks and follows various views, including managerial and nonmanagerial perspectives, in their paper, 'A Sustainability Perspective on Flexible HRM: How to Cope with Paradoxes of Contingent Work'.
Renwick, 2013	According to the study, environmental administration benefits from green human resource management (GHRM).
Opatha, 2014	Green HRM focuses on organization sustainability by successfully developing and implementing all HR activities.
Masri & Jaaron, 2017	From their study, it was found that Green Human Resources Management (GHRM) addresses environment-related issues.
Nejati et al., 2017	With the help of green HRM, organisations can hire experienced, dedicated, and environmentally mindful workers who can help them reduce their carbon footprint by making good use of existing assets like video conferencing, job sharing, telecommunications tools, and less paper printing.
Zaid et al., 2018	Green hiring (GH), green training and engagement (GTI), and green performance management and compensation (GPC) are three aspects of the GHRM bundle that jointly impact the performance of manufacturing organisations.
Tang, 2018	Several environmental policies and practices, including green performance management, green hiring and selection, green training, green compensation and benefits, and green involvement, contribute to the concept of "greening human resources."
Wikhamn, 2019	GHRM refers to "the adoption of HRM strategies and practices that enable the achievement of financial, social, and sustainable development objectives with an impact inside and outside the organisation."
Ansari, Farrukh & Raza, 2021	Organizations can utilize green HR practices to motivate staff to adopt environmentally beneficial habits.
Fernández, 2021	There needs to be more research to aid the effective implementation of various environmental policies. Leadership style has been identified as a critical aspect in creating environmental policies. This research focuses on understanding how organizations might adopt various environmental postures, which will assist managers in developing a strategy that better meets their environmental objectives. Organizations can adopt green HRM practices to their environmental strategic goals to effectively implement green-growth plans.
Ogiemwonyi & Harun, 2021	They found in their study that young green consumers exhibit great concern for the environment.
AlHosani & Rashid, 2022	Managers and other staff members may be encouraged to embrace sustainable construction via the Green Reward and Compensation Schemes' incentives and non-financial recognitions. This could stimulate the groups to take proactive steps in favour of the environment.
Shaha Faisal, 2023	A vast range of definitions, variables, and instruments are available for measuring GHRM.

Source: Literature Review

As the indicative definitions imply, GHRM involves a variety of organizational practices and strategies for which a wide range of approaches are available.

Organizational HR Practices

The organization's leadership sustainability and strategic management are the other dimensions. Green HR is an approach for integrating eco-friendly concepts into HR practices that increase employee engagement, promote cost-effective leadership, and boost organisational sustainability. The primary objectives of training and

development should include HRM knowledge, experience, abilities, attitudes, behaviour, and practices (Shaban, 2019). The theoretical framework of GHRM comprises all the activities and associated with improving, creating, putting into practice, and repairing systems to raise employees' awareness of the environment and become more environmentally conscious in their working methods (Mehta and Chugan, 2015). The goal of GHRM is to change workers' behaviours, attitudes, and performance so that they can become more appropriate from an environmental standpoint. Deshwal (2015) stated that the goal of GHRM is to foster the path of resource optimisation for sustainability.

GHRM aims to use as little paper as possible and promote the adoption of Low Carbon Technology (LCT). It concerns comprehensive organizational processes comprising employee behaviour, leadership, and organizational sustainability. GHRM primarily focuses on converting regular employees into green-oriented behavioural employees. This aims at ensuring the organization's sustainability by implementing environmentally friendly policies and practices. This entails putting into practice the HR departments' hiring, selection, green training, and development processes (Ford, 2012). According to Pham et al.'s (2019) research, using green HRM practices boosts both economic sustainability and encouraging wellness. From a green perspective, the organisational HR practices can be summed up as Figure 1 suggests.

HR practices connected to Green perspective:

Figure: 1



Source: Literature Review and Author's Analysis

GHRM refers to all operations and practices that facilitate improving, designing, implementing, and correcting systems to grow employees up to a green and environment-friendly working style approach (Mehta and Chugan, 2015). GHRM policy supports the efficient use of resources to achieve long-term sustainability (Deshwal, 2015). Sub-functional specificity can be seen as follows.

Green HR Planning: Green HR planning focuses on recruiting employees who have experience in the field of environment (Renwick et al, 2013).

Green Recruitment and selection: All organizations should have a sustainable recruitment strategy as part of their efforts to minimize their carbon footprint. Organizations should choose individuals with prior expertise and knowledge of green practices during hiring. Organizations must seek out people with new viewpoints and ideas (Renwick, 2013).

Green Training and Development: It includes information, activities, and skills needed to teach staff members how to minimize waste, use organizational resources wisely, utilize Low Carbon Technology for energy usage, and minimize those aspects that affect the environment. The HR training and development plan should highlight reduced environmental risks and ecological scarcity, which ought to be created with all levels of employees in mind. The literature research revealed that environmental training is closely linked to the integration of green management and activities in an organization.

Green Performance Management System (GPMS): Green Performance management system enhances environmental performance (Renwick, 2013).

Green Pay and Reward: Green abilities should be integrated into compensation plans. Changes should be undertaken to employee wage structures to reward them for acquiring green skills and fulfilling responsibilities (Deshwal, 2015). From the literature, it has been identified all companies must include both financial and non-financial recognition for employees (Renwick, 2013).

Green Involvement: Green involvement is an important element in an organisation to improve environmental performance by minimizing wastage (Renwick, Redman & Maguire, 2013). From the literature review, it was found that there are four aspects for evaluating green involvement (GI).

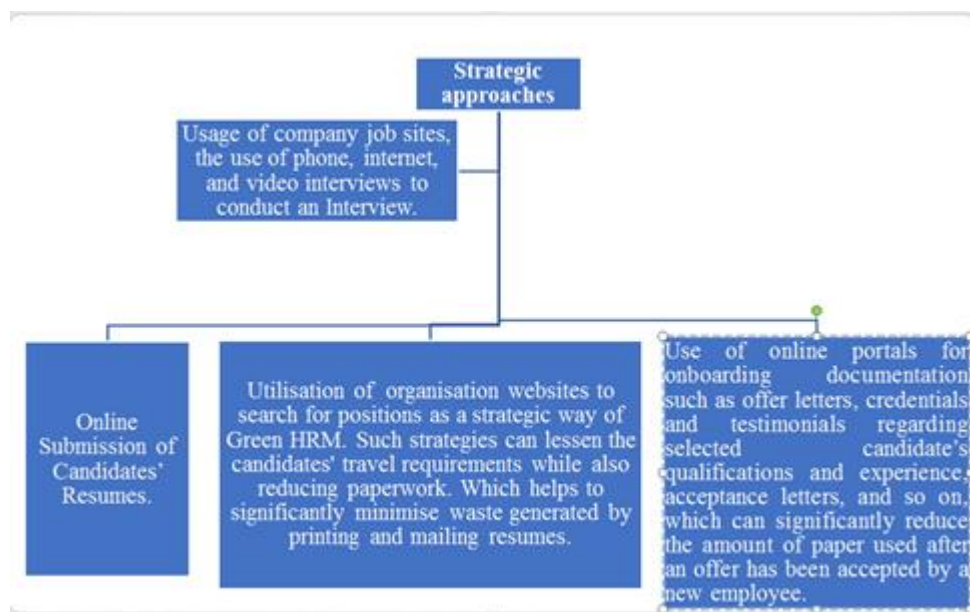
- Implementation of Green practices.
- A clear green vision.
- Multiple communication channels.
- Green Learning Environment.

Green Organizational Culture: GHRM embraces more than just hiring, developing, and keeping environmentally conscious workers. As it fosters an extensive green organisational culture, it is far more comprehensive. Employees start to show good conduct and become self-concerned about the company's green goals once an environmental concern has become deeply ingrained in organisational culture. The top management has to give environmental concerns a top priority in their objectives if they seek to create a green company culture. Regularly providing feedback to employees related to their environmental performance is vital, and it is crucial to address instances of inadequate efficiency (Renwick, 2016). To increase participation, motivation, and involvement, managers should provide employees with the autonomy to explore new ideas and take fresh approaches to improvement (Daily, 2001).

Green Job Design and Analysis: Organizations that care about the environment must create new job positions dedicated to dealing with the organization's environmental issues. Job descriptions must include various job aspects and responsibilities connected to the environment, whereas specifications must include the job's social and technical requirements (Redman & Maguire, 2013).

Examples of the strategic approaches adopted by the organizations to implement Green HRM as outlined in extant literature can be conceptualized as indicated in Figure 2

Figure: 2



Source: Author's interpretation from literature review

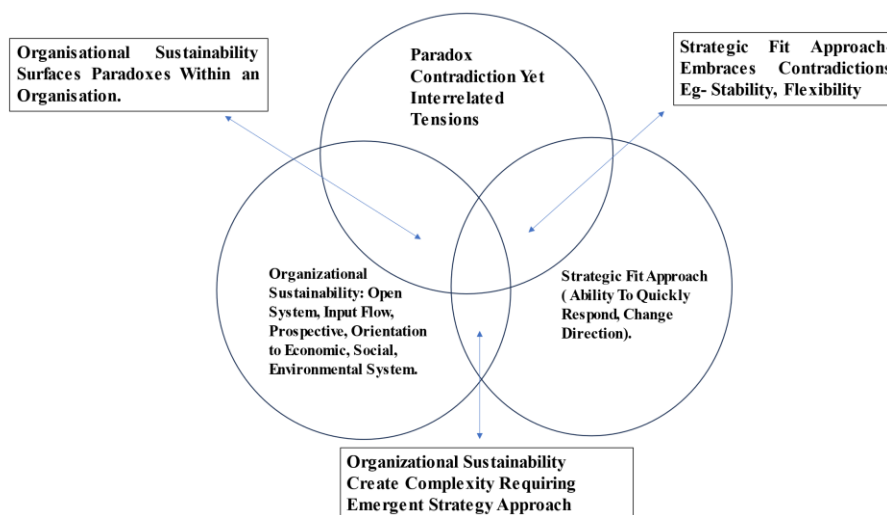
The paradoxes of sustainability in organizations

The sustainability paradox deals with how the internal dynamics of sustainability play out or how individuals inside organizations understand and put sustainability into practice (Crowther, 2008). The word "paradox" has been defined in various ways in management literature. 'A paradox comprises two opposed or contradictory statements (Poole, 1989). According to Lewis 2000, organizational stakeholders' perceptions of conflicts may be connected to how widespread paradoxes are. According to the paradox theory, if organizations can manage the opposing poles of each contradiction, ignoring one side of a dilemma perpetuates a vicious cycle because doing so makes the other side necessary again (Lewis, 2000). When organizational players attempt to choose between the two poles, this limits the creative force buried in the conflict (Sundaramurthy, 2003). On the other hand, it is claimed that by seeing them as possible sources of creativity and knowledge, generating positive solutions may aid organizational members in managing those conflicts (Kolk and Perego, 2014). A paradox framework can also be used to better comprehend environmental sustainability in general, which includes the economic, social, and ecological aspects of organizational sustainability. Environmental sustainability and the general concept of organizational sustainability—which includes the economic, social, and ecological aspects, can be understood better by using a paradox framework. Researchers have observed that businesses pursuing environmental policies must contend with paradoxical tensions, such as:

- (i) the existence of divergent viewpoints within the organizations regarding the degree to which extent environmental sustainability should be incorporated into business processes; ii) organizational members' propensity to address environmental issues may be limited by corporate practices or the organization's culture. iii) managing organizational conflicts, and decision-making in the face of great ambiguity, and iv) organizational sustainability becomes more complex without knowledge (Margolis, Elfenbein, & Walsh, 2010).

Based on the above findings, a framework of paradoxical tensions is presented in Figure 3.

Figure No. 3 Paradoxical Tensions



Source: Literature Review and Author's Analysis

Applying Paradox Theory to Green HRM Research and Practice

Organizations can explore the nature of tensions, rising complexity, and changing organizational environment through paradox theory (Ehnert, 2014). Diverse demands from internal and external stakeholders have been made to jointly accomplish several objectives, such as profit maximisation, long-term organisational viability, and social legitimacy, and to be evaluated according to various criteria, such as economic, ecological, and social (Ehnert, 2014). An expanding population, evolving labour markets, a lack of skill, growing rivalry, and accelerated work are the causes of these challenges. Due to the "contradictory elements that exist simultaneously and persist over time" that Organisational Tensions possess, they have evolved into paradoxes (Smith, 2011). A paradox is defined as "elements, or dualities, that are oppositional to one another yet are also synergistic and interrelated within a larger system" (Lewis, 2011). Tensions arise when a paradox's two opposing poles are in contrast because its logical elements will become inconsistent or even ludicrous (Lewis and Smith, 2011).

The following are the three HRM paradoxes identified from the review of the literature:

The first paradox is that several stakeholders, both internal and external, have presented conflicting demands to concurrently accomplish numerous goals. This dilemma relates to the economic rationality of human resource utilisation without affecting the continuous growth of the HR base. An actual illustration of this contradiction is when personnel is used effectively and economically to maximize the organizational financial return while also protecting the health and well-being of the workers.

The second contradiction is the efficiency-responsibility paradox, which involves being socially responsible and achieving efficiency while also renewing the HR base. Effective use of Human Resources and care for workers' health encourages employees of an organization to participate in CSR activities even outside of hours of operation.

The third paradox, known as the "present-future paradox," is associated with examining the conditions, values, and demands of workforce development both now and in the future. One illustration is the use of flexible employment arrangements (part-time, short-term contracts) to minimize expenses and maximize financial performance while concurrently investing in the advancement of future human resources.

After developing an understanding of organizational green HR practices and paradoxical tensions, an attempt has been made to see the relationship of GHRM and sustainability in terms of a strategic fit.

Ehnert (2014) explores the conflicts that organisations encounter in a dynamic and complicated setting by utilising the paradox theory. Due to the ageing population, a wide range of internal and external stakeholders have established divergent demands to simultaneously achieve multiple goals — profit maximisation, long-term organisational viability, and social legitimacy — and be evaluated along different (e.g., economic, ecological, social) dimensions (Ehnert, 2014). From the literature, it has been identified that GHRM promises potential benefits for both organizations and employees. The practice of Green HRM improves not only organizational performance but also financial performance and contributes to employee well-being within an organization (Lanoie 2008; Crotty and Rodgers 2012). Numerous studies have been done connecting sustainability to various HR issues, such as the detrimental effects of downsizing and talent management (Boudreau & Ramstad, 2005). The long-term viability of human resources has grown in importance for all organisations. (Pfeffer, 2010).

Sustainability and GHRM – Strategic Fit

A new word in human resource management, sustainable HRM, responds to a desire for organizations that report on their sustainability operations to show more outstanding commitment (Ehnert, 2016). From the literature review, it has been identified that various human resource tasks are practiced within an organization to promote organizational sustainability. Green behaviour of employees such as: Environmental Orientation, Green participation in Decision making, Green Innovation, Green Empowerment, can be effectively carried out with the aid of green competency-building practices and green motivation, which improves organizational sustainability.

This indicates a strong relationship between GHRM and organisational sustainability as outlined in Figure 4.

The concept of "sustainability and HRM strategic fit" refers to the compatibility of an organization's HRM plans with its sustainability objectives. Supporting the organization's sustainability goals entails incorporating environmental, social, and ethical factors into HR practices. Here's a closer look at how to establish strategic alignment between HRM and sustainability:

Recruitment and Selection: It emphasizes the Inclusion of sustainability values and selection criteria in the hiring process. People who understand the company's commitment to sustainability and who have the knowledge and attitude to support ecologically and socially responsible practices.

Training & Development: Organisations must offer staff training and development opportunities that inform them of sustainability initiatives, practices, and aspirations. It contributes to developing a workforce that is informed about environmental concerns and capable of implementing sustainable practices.

Performance Management: Performance evaluation and feedback systems should align with sustainability goals. It calls for employing targets for sustainability performance and recognizing staff for their support of green initiatives.

Compensation & Rewards: Creating compensation and incentive schemes that honour and encourage sustainability-related actions is important. This might involve bonuses or other rewards connected to reaching sustainability goals.

Employee Engagement: It means participation in decision-making and environmental initiatives with staff. Employee engagement increases motivation to support the organization's sustainability objectives.

Workplace Policies: Create and disseminate HR policies that help the environment, such as supporting remote work to cut down on commutes, promoting waste reduction, and putting energy-saving measures in place can be instrumental.

Diversity & Inclusion: Encourage an inclusive, varied staff that represents the company's dedication to social responsibility and helps in alignment. Adopt varied viewpoints to improve innovation and problem-solving about sustainability-related issues.

Organisations should think about the following actions to ensure a strategic fit between sustainability and HRM strategies:

Assessment: From the literature it has been found that there are areas for improvement and gaps in organizations' present HRM and sustainability initiatives.

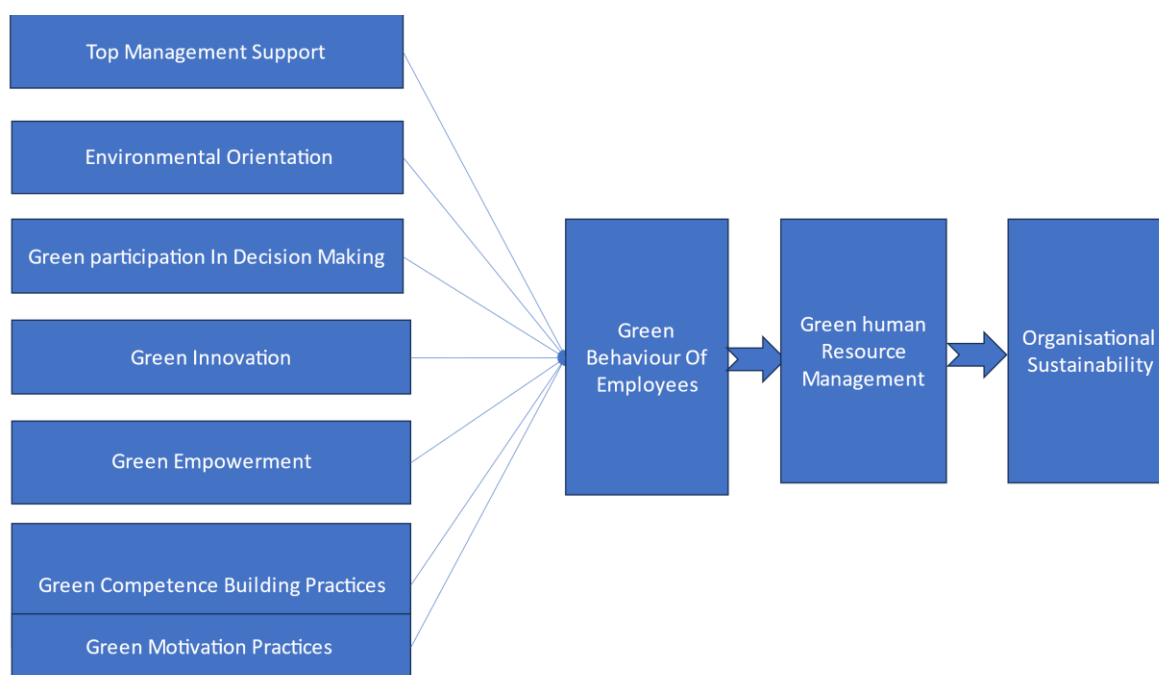
Integration: Integrating sustainability concerns into the current HRM procedures, guidelines, and practices.

Collaboration: Encourage cooperation between the sustainability and HR departments to guarantee alignment and successful implementation.

Measurement: Establish metrics and key performance indicators (KPIs) to gauge the success of sustainability-focused HRM efforts and assess their effects.

Continuous Improvement: Reviewing and updating sustainability-focused HRM plans is essential to make the organisations sustainable.

Figure 4 GHRM and Organizational Sustainability



Source: Literature Review and Author's Analysis

By cutting down on environmental waste and redesigning HR products, methods, and processes, green HR primarily focuses on preserving and safeguarding natural resources and promoting organisational and environmental sustainability. As a result, efficiency improves, and costs are decreased. Among the results were online job interviews, job sharing, teleconferences, recycling, online training, and the creation of ecologically friendly workplaces. As society becomes more environmentally aware, corporations are finally integrating green initiatives into their regular working settings (Renwick, 2013). Enterprises can create green HR initiatives to promote the sustainable use of resources inside the organisation with the help of environmentally friendly HR initiatives. These procedures lead to greater efficiency, lower costs, and happier workers, as shown in Figure 5.

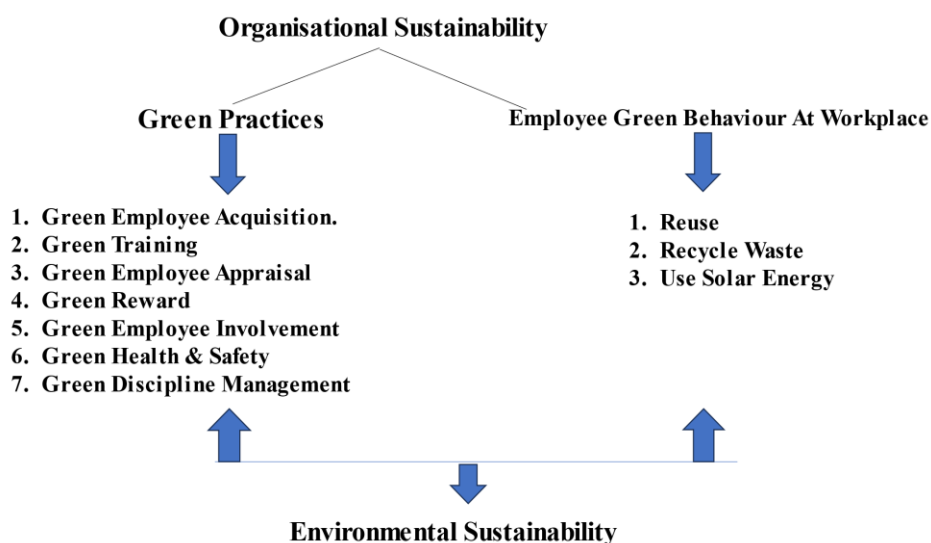
Figure: 5



Source: Literature Review and Author's analysis

Sustainability is one of the most urgent issues facing everyone right now (Olawumi,2018). The workplace green behaviour of employees acts as a key element in the context of social resilience. Green workplace environments can guarantee employee happiness and well-being by promoting a safe and healthy work environment. To that extent, organizational sustainability needs to be integrated with environmental sustainability, as indicated in the Conceptual Framework presented in Figure 6. This framework captures the gap in extant literature and contributes to the void in integration.

Figure 6



Source: By Literature Review and Author's analysis

Conclusions and Implications

A review of the literature indicates the associations between employee empowerment and clear HR policies, strategic management, top management, leadership, and leaders' conduct, as well as environmental awareness raising, teamwork, and enabling. The study indicates that, despite the numerous obstacles that HR professionals encounter when pursuing new situations, they still need to keep the environment foremost when developing HR strategies (analysis, formulation, and implementation) and HR policies that correlate with environmental management. This study attempts to help academics, researchers, and scholars in determining the GHRM topics that require further attention for investigation and analysis. Consequently, future research ought to be proactive about looking into and testing GHRM, and other aspects of GHRM practices in multiple industries.

The current study offers an original perspective on HRM tensions. It creates opportunities for comprehending their complexity and developing proactive and beneficial techniques for managing tensions to advance the sustainability of the company and its HRM systems. The researchers presented the key features of the paradox perspective, related it with HRM theories, and discussed how it can guide future research on tensions in HRM from a novel paradox perspective.

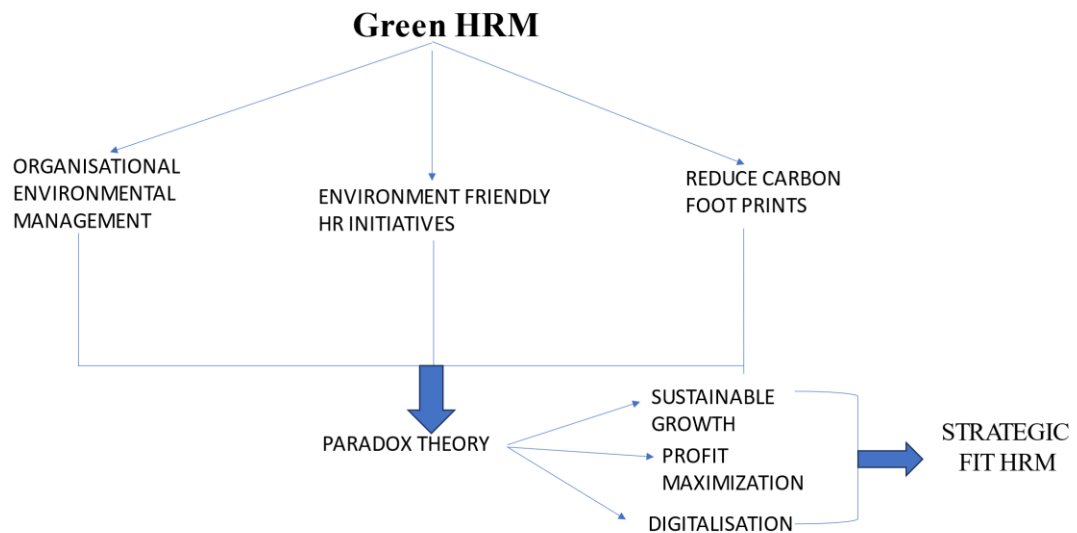


Figure 7 (conclusive Framework)

Source: Author's analysis

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A Study on Effectiveness of Employee Welfare Measures With Reference To Synergy Green Industries Limited: A Review

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Abstract

This study examines the effectiveness of employee welfare measures implemented at Synergy Green Industries Limited, with the aim of evaluating their impact on employee satisfaction, productivity and overall organizational performance. Employee well-being includes activities that enhance employee well-being, safety, and morale, which can increase engagement and loyalty. In this context, research evaluates specific welfare measures provided by Synergy Green Industries, such as health and safety programs, financial benefits, work-life balance initiatives, recreational activities and professional development opportunities.

Using a mixed-methods approach, this study collected data through employee surveys, interviews, and review of organizational records. Quantitative data from surveys provided a quantifiable perspective on employee satisfaction, while qualitative insights from interviews explored deeper understandings of well-being measures and their direct impact on work performance. Analysis of the data collected highlighted both strengths and areas for improvement in the company's welfare initiatives. Findings show a strong relationship between well-being measures and increased job satisfaction, reduced absenteeism and improved employee retention rates. In addition, employees who benefited from welfare programs reported higher levels of motivation and alignment with organizational goals.

This research highlights the importance of strategic well-being programs as a means of fostering a positive work environment and suggests that companies can achieve better results by prioritizing employee well-being. Recommendations for Synergy Green Industries include improving existing welfare measures, particularly in health and career development, and regular assessments to meet the emerging needs of employees. This study provides valuable insights for corporate policy makers, HR professionals and organizational leaders, illustrating that inclusive investment.

Keywords: Employee Welfare, Employee Benefits, Employee satisfaction, Employee engagement, Employee Retention, Work life balance

Introduction

Meaning of Employee Welfare:

Employee welfare refers to "efforts to make the lives of workers more livable".

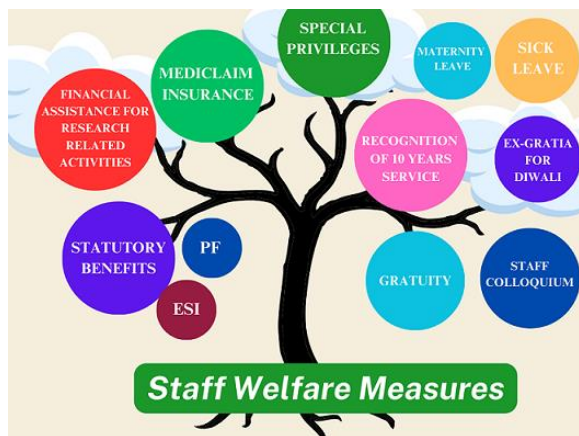


Fig. 1 Welfare Measures [24]

Definition of Employee Welfare:

According to Todd "employee welfare means anything done for the comfort and improvement, intellectual or social, of the employees over and above the wages paid which is not a necessity of the industry.

The term "employee welfare" refers to various services, allowances and facilities provided by employers to their employees. Welfare measures can be of any type or size; No money required. This includes things like stipend, accommodation, transportation, health insurance and food. Employee welfare includes monitoring of working conditions, promotion of industrial harmony through development of health infrastructure, industrial relations and insurance against sickness, accident and unemployment for workers' families. The firm enriches the quality of life for its employees by providing such excellent benefits.

Employee welfare is defined as "efforts to make the lives of workers worthwhile". Employee welfare is a broad term that refers to various services, benefits and facilities provided to employees and companies. The employer enriches the quality of life for the employees by providing such extensive fringe benefits.

Employee welfare is an important aspect of industrial relations, an added dimension, giving satisfaction to the worker in a way that a better wage cannot. It has gained further importance due to the growth of industrialization and mechanization. Industrial workers cannot cope with the pace of modern life with minimum subsistence facilities. He needs extra stimulation to keep body and soul together. Employers have also realized the importance of their role in providing these additional facilities. And yet, no matter how reasonable the demands of the workers, they cannot meet them. They are primarily concerned with the viability of the enterprise. Although proven to contribute to employee welfare, manufacturing efficiency, it is costly. Each employer places varying degrees of importance on employee well-being depending on its priorities.

The basic features of Employee Welfare are as follows:

- Employee welfare includes various amenities, services and facilities provided to workers to improve their health, efficiency, economic upliftment and social status.
- There are welfare measures in addition to regular wages and other financial benefits available to employees due to legal provisions and collective bargaining
- Employee welfare schemes are flexible and ever-changing. New welfare measures are added to those existing from time to time.
- Welfare measures can be implemented by employers, government, employees or any social or charitable organization.
- The objective of Employee welfare is to develop the whole personality of the workers.

Importance of Employee Welfare:

Enhanced Productivity: When employees feel valued and supported, they are more motivated and engaged, which improves focus, efficiency and output in their work.

Employee Retention and Loyalty: Welfare measures encourage employee appreciation, which reduces turnover rates. A supportive environment can increase loyalty, reduce the costs and disruptions associated with frequent employee turnover.

Better health and safety: Health and safety measures, such as access to medical facilities, safe working conditions and wellness programs, prevent workplace accidents and reduce absenteeism, ensuring a healthier, more reliable workforce.

Higher job satisfaction: Employee wellness programs including recreational activities, educational support, and flexible work arrangements to improve employee job satisfaction by helping employees maintain a healthy work-life balance.

Positive Work Culture: A strong wellness program contributes to a supportive and inclusive organizational culture, where employees feel their well-being is a priority. This creates team spirit and collaboration, enhancing the overall workplace environment.

Enhanced Company Reputation: Organizations known for their strong employee welfare policies attract top talent and gain a positive reputation. It helps create a brand that people want to work for and do business with.

Legal Compliance: Implementing welfare measures also ensures that organizations comply with labor laws, reducing the risk of legal issues and fines.

Scope of Employee Welfare Measures:

The scope of employee welfare includes statutory and non-statutory welfare facilities. These facilities which are also increasing day by day and most of the employee Welfare facilities are widely accepted by society. The overall employee welfare's aim is to reduce the stress and strain of industrial workers.



Fig. 2 Employee Benefits [25]

Type of Employee welfare

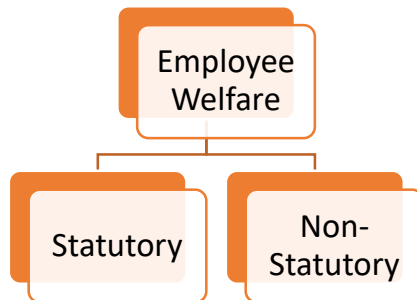


Fig. 3 Types of Employee Welfare

Statutory (Intra-Mural) Welfare Measures

These are welfare measures required by law to ensure the basic health, safety and well-being of employees at the workplace. They usually include:

- Health and safety facilities: safe working conditions, first aid kits, fire protection and emergency exits.
- Clean drinking water: Providing safe and clean drinking water on site.
- Toilet and Sanitation Facilities: Access to clean and hygienic toilets and washrooms.
- Workplace ergonomics: proper seating, ventilation, lighting and reduced exposure to workplace hazards.
- Maternity and paternity benefits: leave and benefits for pregnant and new parents.
- Regulation of working hours: Adherence to rules for working hours, overtime and break time.

Non-Statutory (Extra-Mural) Welfare Measures

These are additional, optional benefits offered by organizations based on goodwill, industry standards, or competitive practices. They vary from company to company and may include:

- Medical Benefits: Health insurance, wellness program and regular health checkups.

- Housing facilities: Assistance with accommodation, including company accommodation or rent allowances.
- Transportation Services: Travel options such as company buses, carpooling services or travel allowances.
- Educational Assistance: Scholarships, training programs or skill development courses for employees or their children.
- Recreational facilities: Access to gyms, sports facilities or social clubs.
- Financial Assistance: Loans, advance payments or support during financial emergencies.
- Childcare Support: On-site crèche or daycare services for employees with children.
- Career growth opportunities: mentoring, leadership programs and internal promotions.
- Employee Assistance Program (EAP): Counseling services, mental health support and stress management workshops.

About Company (Synergy Green Industries Limited)

One of India's leading state-of-the-art foundries installed with the country's largest semi-automated fast loop moulding line for large size castings, produces SG Iron, Grey Iron and Steel castings for wind turbines, wind gear box and general engineering industries like mining, pumps & plastic injection parts in the weight range of 3 to 30 metric tons with a capacity of 30,000 MT.

Objectives:

- To study effectiveness of welfare facilities amongst employees.
- To study satisfaction level of the employees about the welfare facilities.
- To study the impact of employee welfare on employee's performance.
- To analyze the welfare measures and its relationship with employee's commitment to Synergy Green Industries Limited.
- To study opinion about the various welfare measures provided to the employees.

Brief Review of Literature:

Jayashree et al. (2023), [1] study gave information about an in-depth analysis of employee welfare programs in a specific corporate entity. Research examines the relationship between well-being measures and employee satisfaction, productivity and overall organizational performance. The authors employ a mixed methods approach combining quantitative surveys and qualitative interviews to evaluate the effectiveness of these measures. Strength of the study is the detailed exploration of various welfare initiatives such as health benefits, work-life balance programs, and career development opportunities and their impact on employee morale and retention. Findings indicate that the implementation of such welfare measures positively affects employee engagement, which in turn improves productivity and loyalty. However, this study could have benefited from a larger sample size and the inclusion of comparative data from other companies in similar industries. The scope of the research is limited to one institution, which may affect the findings. Additionally, while the paper is clear and well-organized, few areas may have explored the broader implications of these welfare measures on company culture and long-term sustainability. Overall, this paper provides valuable insights into the role of employee well-being in organizational success and provides actionable recommendations for companies looking to enhance their HR practices.

Nagkumari and Pujitha (2021) [2] article analysis provides a comprehensive analysis of welfare measures in the manufacturing sector. How various welfare initiatives affect employee satisfaction, motivation and overall productivity? Article mainly focuses on manufacturing firms as the primary subject of study. The authors present an in-depth review of the types of welfare measures implemented in manufacturing industries, including health and safety programs, financial benefits, work-life balance initiatives, and professional development opportunities. Research emphasizes the importance of these measures in enhancing both individual employee well-being and organizational performance. Using a survey-based approach, the study collects data from employees at various manufacturing companies to assess their perceptions and experiences of these welfare programs. Article is its empirical approach, which provides substantial evidence supporting the positive correlation between employee well-being measures and improved job satisfaction and productivity. The authors also discuss how such programs contribute to reducing absenteeism and turnover rates, highlighting their strategic importance for manufacturing

firms aiming to retain skilled workers in highly competitive markets. This article could benefit from further exploration of the economic implications of implementing comprehensive welfare programs in manufacturing firms, particularly for smaller organizations with limited resources. In addition, while the study included a range of well-being measures, a deeper examination of how these programs are tailored to different employee populations (eg, gender, age, and experience level) would have added value to the findings. Finally, Nagkumari and Poojita's study makes a valuable contribution to the literature on employee well-being, providing insights into how manufacturing firms can optimize their HR practices for enhanced employee engagement and organizational performance. This article is a useful resource for HR practitioners and researchers interested in understanding the effectiveness of welfare programs in the industrial sector.

Nawaz's (2019) [4] study undergoes examining the impact of employee welfare measures in a specific manufacturing sector in Adugodi, India. This paper focuses on understanding how various welfare facilities, including health care, safety measures, housing and recreational activities, contribute to employee satisfaction, motivation and overall productivity. The study uses a survey-based approach to collect data from employees working in manufacturing units, to assess their perceptions of the welfare measures provided by their employers. Nawaz highlighted that effective welfare measures are positively correlated with job satisfaction, lower turnover rates and employee morale. Findings indicate that employees who feel supported by welfare facilities show higher engagement and are more likely to stay with their employers for a long time. The study is its focus on a specific geographical and industrial context, which focuses on the reality of welfare measures in the Indian manufacturing sector. This study could benefit from a larger sample size and comparable data from other regions or industries for more effective results. Study additional provides information about deeper exploration of the financial impact on businesses will provide a more holistic understanding of the cost-benefit balance of employee welfare initiatives. Nawaz's paper provides valuable insights for business and human resource professionals seeking to optimize employee well-being in manufacturing industries, particularly in emerging economies.

Chatterjee, Wadhwa and Patel's (2018) [6] study examine the role of employee welfare initiatives to improve job performance in the healthcare sector. This cross-sectional descriptive study focuses on private hospitals and their research centers, investigating how welfare programs, such as health benefits, work-life balance policies, and professional development opportunities, influence employee motivation, job satisfaction, and productivity. A significant positive correlation was found between well-structured well-being measures and improved staff performance, with hospital staff reporting higher levels of engagement and effectiveness when providing comprehensive well-being support. A notable strength of this study is its focus on the health care sector, which is often underexplored in well-being-related research. However, the scope of the study is limited by its reliance on a single industry and sample size, which may not fully represent broader employee well-being trends. Additionally, while studies highlight the importance of employee well-being in improving organizational outcomes, employers may benefit from a more detailed analysis of the financial implications. Overall, this paper provides useful insights for hospital administrators and human resource professionals who seek to increase employee satisfaction and performance through targeted well-being initiatives.

Vadnala, M. and Kumari, P.B.P., (2017) [8] This study examines the functioning of the Human Resource (HR) Department at Bharat Heavy Electricals Limited (BHEL), Ramachandrapuram, Hyderabad, by examining the contribution of employees and their views on HR activities. Employees were directly interviewed and data was collected through questionnaires. The main focus of the study was to understand how employee welfare programs affect job satisfaction. Employee welfare refers to basic welfare and support provided by the organization to keep the employees motivated. The objective of this study was to assess employee satisfaction with welfare facilities and to suggest improvements. The research involved 100 employees from various departments and the data was analyzed using percentage analysis and correlation methods.

Nithyavathi, K., (2016) [9] Most workers in the textile industry feel safe at work and believe that safety measures help reduce the impact of accidents. The study also shows that many employees are satisfied with the welfare measures offered, such as support programs and facilities. However, there are areas that can be improved to further satisfy employees. Some workers were not satisfied with the transport facilities, rest house conditions and time arrangements. Management can focus on these issues to increase satisfaction levels. This study suggests that, in the future, researchers can explore textile safety and welfare in the state at large to find ways to improve these measures for employee satisfaction.

Manasa, B.R. and Krishnanaik, C.N., (2015) [10] Employee welfare includes various efforts by employers to improve the quality of life of their employees, beyond just paying wages. These welfare measures aim to keep employees relaxed, motivated and happy. Welfare schemes can be divided into two types: intra-mural and extra-mural. Intra-mural plans are required by law and focus on employee health and safety, such as safe working conditions. Extra-mural plans are optional and vary by institution; May include additional benefits based on the employer's generosity and willingness to support employees. The main objective of employee welfare is to

improve the overall well-being and job satisfaction of employees. This paper analyzes both types of welfare schemes and their impact on employee satisfaction in Thandur and Adilabad units of Cement Corporation of India, with special focus on layoff benefits and welfare measures for temporary employees.

Patro, C.S., (2015) [11] Employees are essential for the success and growth of any organization, so their welfare is very important. In recent years, both public and private organizations have offered benefits to help employees and increase their productivity. Employee welfare services may include housing, free medical care, retirement benefits, education support for employees and their families, and loan options. If organizations expect high performance from employees without taking care of their needs, it can lead to poor results. Providing these benefits helps motivate employees. This study compares how satisfied employees are with welfare measures in both the public and private sectors and examines how these benefits affect their work performance.

Ramana, T.V. and Reddy, E.L., (2015) [12] Employee welfare is an effort to provide the employees with comfort, intellectual growth and social needs beyond just their wages. Organizations provide these benefits to keep employees motivated and satisfied. Welfare programs are divided into two types: intra-mural and extra-mural. Intra-mural programs are legally required benefits related to employee health and safety, such as safe working conditions. Extra-mural programs are optional and vary by institution, including extra benefits such as sports, cultural events, library and travel leaves. These benefits show the care and generosity of the organization towards the employees. Welfare programs aim to improve the quality of life of employees and make them feel valued. This study examines both the types of welfare programs and their impact on employee satisfaction in South Central Railway. These findings show that extra-mural programs such as sports and cultural activities are generally positive, while some intra-mural facilities such as protective clothing, crutches, toilets and drinking water, need to be improved to better satisfy employees.

Lalitha and Priyanka's (2014) [15] paper provides an insightful examination of welfare measures in the IT sector. The authors explore mandatory and voluntary welfare measures and evaluate their impact on employee satisfaction and productivity. This study is its focus on the specific needs of IT employees, who often face high stress and long work hours. Analyzing welfare schemes such as health benefits, work-life balance initiatives and recreational facilities, the authors show the positive effects of these measures on reducing burnout and increasing job satisfaction. Their findings show that when organizations invest in comprehensive wellness solutions, employees tend to show higher engagement and loyalty, which is critical in a fast-paced industry like IT. The study also highlighted areas where IT companies could improve, such as more flexible work options and mental health support. However, one limitation is that the research relies heavily on surveys, which may not capture the full depth of employee experiences. The paper provides valuable recommendations for IT companies in terms of enhancing employee well-being and ultimately organizational performance.

Pawar, I.A., (2013) [18] VSP is one of the top steel producers in the country. For any organization, employees are the key to growth and success, so the HR department should focus on meeting their essential needs. Welfare measures include two types: statutory measures (required by law) and non-statutory measures (additional facilities provided for the comfort and support of employees). The main objective of these welfare measures is to help the organization achieve its objectives. When employees feel supported by these benefits, they feel more committed and perform their best work. This article examines how effective these welfare measures are in VSP through a detailed case study.

Van De Voorde, K., Paauwe, J. and Van Veldhoven, M. (2012) [22] There is a lack of consensus on the role of employee well-being in the human resource management-organizational performance relationship. This review examines which of the competing approaches—'mutual gains' or 'adversarial effects'—is more appropriate to describe this role of employee well-being. In addition, this review examines whether study quality, such as measurement of key variables, level of analysis, and study design, affects study outcomes. The author included 36 reviews quantitative studies published from 1995 to May 2010. Employee well-being is described using three dimensions: happiness, health, and relationships. The main findings are that employee happiness and relational well-being are congruent with organizational performance (mutual benefit perspective), but health-related well-being appears to act as a conflicting effect. Directions for future research and theoretical development are suggested.

Venugopal, D., Bhaskar, T., Principal, V.I.C.E. and Usha, P., (2011) [23] In research authors found that employees in industrial cluster of Chittoor district are availing statutory welfare measures like recreational, medical, educational, housing, transport, sanitation, safety and workers compensation, ESI, sickness, P.F and maternity benefits. But these industries have to provide some more welfare facilities like gratuity, pension, welfare fund to their employees, so that they can retain the employees and the quality of their working life. They also identified that organizations maintain a smooth relationship between employees and management, which leads to success in the efforts of the organization.

Conclusion:

The study of the effectiveness of employee welfare measures at Synergy Green Industries Limited highlights the important role that welfare programs play in increasing employee satisfaction, motivation and productivity. Research has shown that employees generally respond positively to both statutory and non-statutory welfare measures, which create a supportive work environment and strengthen an organization's culture. On the other hand, the study also identified specific areas for improvement, such as upgrading existing health and safety facilities and expanding recreation and support services to better align with employee needs. For this paper researcher identified twenty five different articles/papers and reviewed thirteen amongst those for study. Findings suggest that by investing in comprehensive wellness initiatives, Synergy Green Industries can increase employee morale and commitment, which are critical to long-term organizational success. The study highlights the importance of periodically reviewing and adapting welfare measures to ensure relevance and effectiveness. Future research could build on this foundation by examining the impact of advanced welfare programs and comparing them to industry benchmarks. Overall, this study emphasizes that effective employee welfare measures are key to creating a motivated workforce and a resilient organization.

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Impact of State Special Economic Zone (SEZ) Act/Policy on Investment – A State Level Analysis in India

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Abstract

Special Economic Zones (SEZs) are considered as a model for economic growth and development. The central SEZ Act, 2005 is the mother act to govern and regulate SEZs in India. In addition, state governments are allowed to make their own SEZ Act and policy to prescribe state-specific SEZ law for better regulation of SEZs. SEZ developers and units, both enjoy certain fiscal and non-fiscal benefits provided by both central and state SEZ Act and policy. All the states in India have not enacted state SEZ Act/Policy. In this backdrop, this paper identifies regional disparity among state-wise investment in SEZs. Further, this paper identifies the impact of the state SEZ Act and policy on the investment of the respective state. Panel data regression (Random Effect Model) is used on the available data for the period 2011-12 to 2022-23. The study reveals that state level SEZ Act and/or policy is quite a significant variable in bringing investment in a state in India.

Keywords: Special Economic Zone; SEZ Investment; State-wise SEZ Investment; State SEZ Act; SEZ Policy

Introduction

Special Economic Zone (SEZ) is a demarcated area within the national boundary of a country specifically designed to expedite economic development. India is the first country in Asia to set-up Export Processing Zone (EPZ) as early as in 1965 in Kandla, Gujarat. Motivated by the China's success story in SEZ, the central government set up another six SEZ till 1990 in different parts of the country. All these EPZs were multi-product EPZ and primarily aimed to enhance India's export of goods and services. In 1994, the central government allowed state government(s) and private entities to set-up and operate EPZ. In the year 2000, all the EPZs were converted to SEZs. The primary difference between EPZ and SEZ is that the former one is dedicated industrial estate and the latter one is an industrial township. To invite more private investment and have a stable policy framework, the government enacted SEZ Act, 2005 which came into force in 2006.

SEZs enjoys both fiscal and non-fiscal benefits provided by central and state governments. Fiscal benefits include exemption from payment of income tax, upfront exemption from payment of Goods and Service Tax (GST), exemption from excise and customs duty, inter alia. Non-fiscal benefits are single window clearance, dedicated payment gateway, easy clearance of goods from ports, among others. The central benefits are same for all states.

One of the major objectives of SEZ Act is to bring investment from domestic as well as foreign sources. The government was predictable that the SEZ Act will trigger a large flow of foreign and domestic investment in infrastructure and productive capacity (C&AG Performance Audit, 2014), leading to generation of additional economic activity and creation of employment opportunities. State governments also intended to take most of the benefits of SEZ scheme for enhancement of state's socio-economic condition through increased employment prospects and industrial development. Many state governments have developed State SEZ Policies in accordance with Government of India (GoI) recommendations for SEZs to offer a thorough framework for the development, operation, and sustainability of the SEZ in the State.

After the enactment of SEZ Act, 2005, SEZs started mushrooming in India. By the end of 31st March, 2024, 280 SEZs were operational in the country, including 7 central and 12 state government / private sector SEZs which were set-up prior to the enactment of SEZ

Act, 2005. The total investment attracted by these SEZs till 31st December, 2023 is shown in Table 1. The investment increased by more than 160 times during the period 2006 to 2023. The central government invested heavily on EPZs in the early days. Apart from the seven central SEZs which were set up before SEZ Act came into force, the central government has not invested any amount on any new SEZs notified under the SEZ Act, 2005. Moreover, after the introduction of SEZ Act, no SEZs has been developed by central government.

Table 1: Investment in SEZ as on 31.12.2023

(Figures in INR)				
Investment	Central Government SEZs	State/Pvt. SEZs set up before 2006	SEZs notified under the SEZ Act, 2005	Total
Investment (as on February, 2006)	2,279.20 Cr.	1,756.31 Cr.	-	4,035.51 Cr.
Incremental Investment	29,694.45 Cr.	12,459.77 Cr.	6,46,723.84 Cr.	6,88,878 Cr.
Total Investment (As on 31 st December, 2023)	31,973.65 Cr.	14,216.08 Cr.	6,46,723.84 Cr.	6,92,914 Cr.

(Source: Fact Sheet on SEZ as on 30.04.2024 available at www.sezindia.nic.in)

SEZ Act, 2005 very explicitly stated that SEZs can be developed either by central government or state governments or private sectors or any combinations thereof . Between February 2006 and December 2023, investment in SEZs surged from INR 4,036 crores to INR 6,92,914 crores. This increase is mainly made by private players after the enactment of SEZ Act in 2006. However, when we see the state-wise investment data, we find asymmetric SEZ investment among the states. Only 16 states in India have attracted SEZ investment as on 31st March, 2023 . Among these, only 3 states account for 62% of total investment. These states are Gujarat, Karnataka, and Maharashtra. Likewise, none of the north eastern states or Himalayan states have received any investment in SEZ scheme. Now the obvious questions come, that, if central government benefits in respect of SEZs are same to all states, then why there is difference in investment among states? Does state SEZ Act or Policy have any impact in bringing investment in SEZ?

This paper addresses the above questions. Section 2 discusses about the present status of state-wise SEZ Act or Policy and asymmetric distribution of SEZ investment among states. Existing literatures and research objectives have been discussed in section 3. Period of study, research methods and source & collection of data is addressed in section 4, section 5 and section 6 respectively. Section 7 shows the analysis and interpretation of the result. Section 8 notes policy recommendation followed by conclusion at last section.

Current Status of State SEZ Act/Policy and Investment in SEZ

Not all the states in India have been able to attract investment in SEZ scheme. Reasons might be manifold. One probable reason is the state's willingness to attract investment in SEZ scheme. This willingness may be made by making dedicated state SEZ Act / Policy which many states have already made. This helps investor to understand state's exact stand on the SEZ issue. The states which have not formulate policy may have similar willingness but absence of written document makes it difficult to let investor know government's thinking. Absence of such document indicates policy instability for long run. It may be noted that, in addition to central SEZ Act, 2005 which has been given effect from 2006, many state governments have their own set of SEZ Act / Policy. Some of the states made policy even before the central SEZ Act was passed. Like, the state of West Bengal made the SEZ policy in 2001 and SEZ Act in 2003. Table 2 shows states having SEZ Act/policy with their year of enactment or implementation. While states like Maharashtra, Kerala, Karnataka, and Uttar Pradesh have SEZ policies, no Act(s) or Rule(s) relevant to SEZ have been passed in those states, which is an important point to note. These states account for 39% of operating SEZs in the country . On the other hand, despite having a decade old SEZ Act and Rules, states like West Bengal, Madhya Pradesh and Haryana, could not bring in much investment as expected. The state of West Bengal even after having an active SEZ Act and Policy did not give recommendation for set up SEZ in recent past.

Table 2: State-wise enactment details of SEZ Act and / or SEZ Policy

States	Year in which SEZ Policy was passed	Year in which SEZ Act was passed
Chandigarh	2005	No
Gujarat	No	2004
Haryana	2006	2006
Jharkhand	2003	No
Karnataka	2009	No
Kerala	2008	No
Madhya Pradesh	2001	2003

Maharashtra	2001	No
Punjab	2005	2009
Tamil Nadu	2003	2005
Uttar Pradesh	2007	No
West Bengal	2001	2003

(Source: Compiled from available data at <http://www.sezindia.nic.in/> and Lok Sabha Starred Question No. 483, for answer on 2nd April, 2018; Note: The word "No" above indicates that the state has not yet passed a separate SEZ Act. / Policy)

Another reason may be geographical location of state. Coastal states will have better investment opportunity for export of goods. Similarly states with availability of any particular mineral may attract investment. As SEZs primary thrust is to export, manufacturing SEZs shall tend to locate near port for easy transportation facility. However, service SEZs like, Information Technology / Information Technology enabled Services (IT/ITeS) SEZ, engineering service SEZ, financial service SEZ may not be located near port. These SEZs will locate where skilled labour and easy connectivity is established.

The third reason may be infrastructure facility. A state with higher infrastructure facility will have better likelihood to attract investment. Infrastructure facility includes, road connectivity, availability of port, power, banking services etc. Hence, taking all discussions together, it can be said that ability of a state to get investment in SEZ shall depend in more than one factor.

Only 16 states in the country had operational SEZs as on 31st December, 2022 . State-wise investment made in SEZs in India are given in Table 3. As stated in previous section, there are 16 states in India which have received SEZ investment as on 31st March, 2023. Out of these 16 states, only 11 states have either SEZ Act or Policy. It implies there are some states that has not formulated any SEZ Act or Policy but has received SEZ investment over a considerable period. This is depicted in Figure 1.

Figure 1: SEZ Act/Policy and SEZ Investment Matrix

		Investment Received	
		Yes	No
SEZ Act / Policy	Yes	11 States/UT ¹ Investment value Rs.5,41,146 crore as on 31.03.2023	1 State ²
	No	5 States ³ Investment value Rs.1,19,038 crore as on 31.03.2023	

(Source: Author's own compilation from state-wise investment data provided by SEZ Section, Dept. of Commerce, Govt. of India)

It is seen from the above figure that around 18% of SEZ investment as on 31st March, 2023 is in those 5 states which have not formulated any SEZ Act or Policy. These 5 states also comprise 27% and 26% of notified SEZs and Operational SEZs respectively of the country as on 31.12.2022 . Thus, it is evident that even if there is no state SEZ Act or Policy, some states are receiving investment in SEZs and that is quite significant. So having state SEZ Act or Policy is not the sole factor to attract investment in any state. This statement can again be validated by looking at the state of Jharkhand where even after having a SEZ Policy since 2003 no investment has been attracted. Thus, it can be said that there are some other factors, other than SEZ Act/Policy, which attracts investment in SEZs.

Further to test whether state SEZ Act/Policy has the sole effect in attracting investment, year-on-year growth in investment is analysed for those states which have formulated state SEZ Act/Policy. The result of the same is depicted in Table 4.

Data reveals that there is high volatility in year-on-year growth in investment. Even in some states, the investments have been withdrawn which is represented by negative figure in the table. While Karnataka recorded an average

growth rate of 30%, both Kerala and Maharashtra recorded 13% each. Except the state of Gujarat and Uttar Pradesh, the standard deviation in growth rates for all other states exceeds 8% and above; which indicates high uncertainty and volatility in investment. For the state of Karnataka and Kerala, the standard deviation remained 0.41 and 0.25 respectively. Hence within the state and among the states, there are deviations in respect of investment in SEZs. This again validates, having SEZ Act/Policy cannot be sole variable to bring investment in any state. There are other factors which also plays an important role in investment decision.

Combining the above observations, it is clear that a thorough review of literature shall help to identify investment attracting variable(s). Nevertheless, an analyse of each state's SEZ Act/Policy will be useful to check homogeneity among them and to check its effect on investment decision. [subsequently analysed].

Review of Literature and Research Objective

Previous studies have shown that private investment depends upon physical infrastructure (Krishna, M. J., & Venugopal, J., 2003), quality of governance (Aysan, A.F. et. al., 2006), government expenditure (Akinlo, T., & Oyeleke, O. J., 2018), economic uncertainty (Öge Güney, P., 2020), labour productivity (Stundziene, A. & Saboniene, A., 2019), low production cost and low labour wage (Nackhavong, K. & Thanitbenjasith, P., 2020) among others. Studies have also shown political stability (Kurecic, P. & Kokotovic, F., 2017) and fiscal reforms (Hasan, M.A. et. al., 1996) are the two most important factors determining investment inflows across states. It is worth to mention that factors like easy availability of port, natural resources, suitable weather conditions etc., also play a vital role in determining investment proposals (Chakraborty, T. et. al., 2017). Sharma, S.P. et.al (2015) in their study has found that operating in Domestic Tariff Area (DTA) has become more beneficial as compared to operating within SEZs especially after withdrawal of exemption for Minimum Alternate Tax (MAT) and Dividend Distribution Tax (DDT) for the SEZs. Naeem, S. et. al (2020) have suggested that competitiveness, not financial incentives, should be the basis for zone promotions; and for sustainable operations inside the zones, joint ventures and PPP should be promoted. Susanne, A. et al. (2023) have also stated that investment is attracted by an effective industrial infrastructure, strategic location, and service availability within the zones. Contrarily, fiscal incentives have a negligible impact on investment choices.

So, some factors are man-made and controllable while others are non-controllable. Disparities in investments in SEZs, among states and regions within the state, have been steadily increasing in past few years, in spite of high growth rates. The benefits of high growth rates did not reach to backward regions/states.

As on 31.12.2022, Tamil Nadu has highest number (50) of operational SEZs followed by Maharashtra (37), Telangana (36), Karnataka (34), Andhra Pradesh (25), Gujarat (21) & Kerala (20). These states account for 82% of total operating SEZs in country .

Thus, it is noted that any investment in SEZ is made after taking into account many factors, including benefits provided by state government through state SEZ Act and/or Policy. In this context, it is pertinent to check the impact of State SEZ Act/policy in bringing the investment to the State. Though various studies have already established the determinants of investment among states, no study has been found on investment determinants among states in relation to SEZs and the importance of SEZ Act/Policy thereof. As no studies has yet covered this aspect, there exist a research gap. This research gap is addressed by making the following research objective.

To study the impact of State SEZ Act and Policy on investment made in SEZs in the concerned State.

Table 3: State-wise Investment Made in Special Economic Zone (SEZs) in India (2011-12 to 2022-23)

State/UT	Investments# (in Rupees Crore)											
	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Andhra Pradesh	17,941	25,425	31,275	20,149	25,555	23,881	24,721	25,656	27,842	31,174	39,470	41,738
Chandigarh	229	213	228	260	282	349	368	382	390	398	438	552
Chhattisgarh	0	617	218	864	1,076	1,470	1,741	1,741	1,635	1,635	1,635	1,635
Goa	297	297	297	297	297	297	297	297	297	297	0	0
Gujarat	91,520	98,529	1,03,600	1,22,702	1,35,135	1,50,302	1,69,335	1,81,986	1,93,174	2,08,067	2,19,565	2,23,398
Haryana	6,166	6,426	7,022	7,331	9,988	9,499	11,218	12,286	12,988	14,319	14,287	14,616
Karnataka	9,073	11,910	29,810	37,967	37,967	54,460	62,582	75,016	97,496	1,04,489	1,05,911	1,06,650
Kerala	5,557	5,536	6,158	6,003	6,114	7,174	13,539	13,591	16,553	17,034	17,192	17,984
Madhya Pradesh	2,821	3,119	3,884	3,980	3,995	4,307	6,022	6,205	6,363	7,291	7,350	7,612
Maharashtra	21,919	32,939	39,898	47,997	48,127	51,429	57,899	60,276	67,195	72,235	75,571	79,718
Odisha	6,537	3,118	21,978	21,981	24,124	17,165	17,713	18,792	20,119	20,434	20,444	20,444
Punjab	529	551	560	673	679	837	866	921	934	940	961	983
Rajasthan	762	1,105	1,115	1,216	1,387	1,537	1,637	1,822	2,248	2,315	2,505	2,611
Tamil Nadu	27,485	33,871	37,168	41,487	48,476	56,037	61,578	56,803	62,997	66,157	64,903	54,908
Telangana	0	0	0	12,457	17,416	26,160	24,448	28,024	34,706	42,658	48,100	52,610
Uttar Pradesh	8,426	10,012	10,664	10,778	12,555	14,804	16,470	18,636	20,825	22,105	24,408	27,759
Uttarakhand	23	23	0	0	0	0	0	0	0	0	0	0
West Bengal	2,590	3,026	2,788	2,651	3,032	3,483	4,485	5,210	5,974	5,951	6,966	6966
India	2,01,875	2,36,717	2,96,663	3,38,794	3,76,494	4,23,189	4,74,917	5,07,644	5,71,735	6,17,499	6,49,706	6,60,184

(Source: Data Provided by SEZ Section, Dept. of Commerce) # Calculated on cumulative basis.

Table 4: Year-on-Year Percent growth in investment for the States having SEZ Act/Policy

States/UTs	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	Mean	S.D.
Chandigarh	(7%)	7%	14%	8%	24%	5%	4%	2%	2%	10%	26%	9%	9%
Gujarat	8%	5%	18%	10%	11%	13%	7%	6%	8%	6%	2%	9%	4%
Haryana	4%	9%	4%	36%	(5%)	18%	10%	6%	10%	0%	2%	9%	10%
Karnataka	31%	150%	27%	0%	43%	15%	20%	30%	7%	1%	1%	30%	41%
Kerala	0%	11%	(3%)	2%	17%	89%	0%	22%	3%	1%	5%	13%	25%
Madhya Pradesh	11%	25%	2%	0%	8%	40%	3%	3%	15%	1%	4%	10%	12%
Maharashtra	50%	21%	20%	0%	7%	13%	4%	11%	8%	5%	5%	13%	13%
Punjab	4%	2%	20%	1%	23%	3%	6%	1%	1%	2%	2%	6%	8%
Tamil Nadu	23%	10%	12%	17%	16%	10%	(8%)	11%	5%	(2%)	(15%)	7%	11%
Uttar Pradesh	19%	7%	1%	16%	18%	11%	13%	12%	6%	10%	14%	12%	5%
West Bengal	17%	(8%)	(5%)	14%	15%	29%	16%	15%	0%	17%	0%	10%	11%

(Source: Author's own computation from state-wise investment data provided by SEZ Section, Dept. of Commerce, Govt. of India; Note: Figures in bracket indicates negative growth)Period of Study

The study is based on the period from 2011-12 to 2022-23. Data for earlier periods were not available and thus could not be used.

Research Methods

Existing literature shows that there are broadly four factors which directly or indirectly affect the locational decision of investment. These are state of economy, labour, infrastructure and government policy. Each of these factors can be measured by a single or many variables. For the purpose of present study, the representative variables as shown in Table 5 have been taken against their factor. The reason for choosing these representative variables against their factor are given below.

Table 5: Investment attracting factors and their representative variables

Sl. No.	Factors	Representative Variables
1	Economy of the State	Per capita Net State Domestic Product (NSDP)
2	Labour	Availability of labour
3	Infrastructure	Availability of power
4	Government Policy	State specific SEZ Act/Policy

Per Capita Net State Domestic Product (NSDP): The net book value of all the finished products and services produced geographically inside a state over a specific time period is measured by the NSDP. When we divide the NSDP by the total population of the state we get per capita NSDP. The NSDP is regarded as a more accurate economic indicator than the GSDP since it includes information on the amount of money invested in maintaining and upgrading outdated machinery. The GDP level can rise due to an increase in depreciation alone, but this does not mean that the social and economic conditions of the nation have improved. NSDP thus serve as a production-based indicator of a state's economic health.

Availability of Labour: Industry location decisions are significantly influenced by the availability of an educated, competent workforce at competitive cost in a supportive labour environment (Parmar, C. K. & Ghosh, P. P., 2021). Hence, availability of labour represents the entire labour factor.

Availability of Power: A state's infrastructure is represented by many variables like road density, power shortage and average power production, rail network in state, number of bank branches in a state, cargo handled in port etc. Among these, for the present study, availability of power has been chosen. It is accepted that SEZs are mainly established for export of goods after manufacturing. Being a manufacturing unit, requirement of power is essential. Hence higher the power consumption, higher the production (may be assumed). Thus, availability of power represents the business infrastructure in that state.

State Specific SEZ Act/Policy: For the purpose of present study, State SEZ Act / Policy is the best representative of government policy. To attract investment in a state, if state makes a policy it indicates, there exist government policy and vice-versa. To understand the effect of State SEZ Act / Policy, only those states which have formulated any Act and/or Policy are being considered in the present study.

Decomposing State SEZ Act/Policy:

Next, to understand the degree of effectiveness of state SEZ Act / Policy, each of the policy have been decomposed. For this purpose, for every state, state SEZ Act/Policy has been analysed. After going through the Act/Policy, major components which work as stimulus to developer or unit to make investment, have been identified. These components vary from state to state. It is assumed that more the number of components in an Act/Policy, more the Act/policy is 'investment friendly'. As these components are qualitative sub-variables and to measure the impact of entire Act/Policy as a whole, an equal weight has been assigned to each component. Thus, the summation of components has been recognized as total score for that Act/Policy. The identified components of each state along with total score have been depicted in Table 6.

The present study is conducted with state SEZ investment, being dependent variable and other considered variables as independent variables (as shown in Table 5). The study is based on 11 states which has formulated state SEZ Act/Policy and received SEZ investment. Panel Data regression analysis method has been done to study the economic relationship using cross section series with a time dimension. The group of independent variables has been combined which represent investment potential. Thus, the model is given as follows:

Investment in SEZ = f (State Economy, Labour Measure, Infrastructure, State SEZ Act/Policy)

The estimated equation of the form is given by -

$$Y_{it} = \alpha_i + \beta x_{it} + \varepsilon_{it} \dots \dots \dots (1)$$

Where i represent the state and t represent the time for the dependent variable Y and independent variable x . α is the parameter specific to each state and does not vary with time. Taking following variables, after testing linearity, the regression equation is represented below:

$$INVT_{i,t} = \alpha + \beta_1 NSDP_{i,t} + \beta_2 AVALLB_{i,t} + \beta_3 ENERGY_{i,t} + \beta_4 SEZAP_{i,t} + \varepsilon_{i,t} \dots \dots (2)$$

Where $INVT$ represents SEZ investment, $NSDP$ represents Net State Domestic Product (Current Price), $AVALLB$ represents availability of labour, $ENERGY$ represents availability of power (net crore units), $SEZAP$ represents score in State SEZ Act/Policy and β_1 to β_4 are the parameters to be estimated.

Tools Used

The stated research method has been used using the Eviews-11 statistical programme. It is assumed that intercept is different for different states. Also, it is considered that time period does not have different intercept. Thus, the present study has only one-way effect.

Source and Collection of Data

Required Data	Source of Data
State-wise investment in SEZs	Data in respect of state-wise investment in SEZ provided by SEZ Section, Department of Commerce.
State-wise NSDP & availability of power	RBI Handbook of Statistics on Indian States 2022-23.
State-wise availability of labour	<u>Lok Sabha unstarred</u> question No. 2366 answered on 8 th July, 2019 and Employment Exchange Statistics 2018 to 2023, Directorate General of Employment.
State SEZ Act/Policy	Official website of SEZ, Govt. of India www.sezindia.nic.in [Accessed between May, 2024 to November, 2024] <u>Lok Sabha Starred</u> Question No. 483, answered on 2 nd April, 2018 ¹

Table 6: Decomposing State SEZ Act/Policy and Identification of Score

State SEZ Act/Policy Parameters										
States/UT	Single Point Clearance	Provision for collection of User Charges by the Developer or Co-developer	Exemption of Stamp Duty and Registration fees for Registration of Land and Loan/Credit Documents	Exemption of Electricity Duty	Exemption of 1% Labour Welfare Cess	One-time capital subsidy	Consolidated Return under various laws	Delegation of Power of Labour Commissioner to Development Commissioner	Interest Subsidy to MSME	Score
Chandigarh	×	×	✓	✓	×	×	×	×	×	2
Gujarat	✓	✓	✓	✓	×	×	✓	✓	×	6
Haryana	✓	×	✓	✓	×	×	×	×	×	3
Jharkhand	✓	×	✓	✓	×	×	×	×	×	3
Karnataka	✓	✓	✓	✓	✓	✓	✓	✓	×	8
Kerala	✓	×	✓	✓	×	×	×	×	×	3
Madhya Pradesh	✓	×	✓	✓	×	×	×	✓	×	4
Maharashtra	×	×	×	✓	×	×	×	×	×	1
Punjab	✓	✓	✓	✓	×	×	×	✓	×	5
Tamil Nadu	✓	×	×	×	×	×	×	×	×	1
Uttar Pradesh	✓	×	✓	✓	×	×	×	✓	✓	5
West Bengal	×	×	✓	✓	×	×	×	✓	×	3

(Source: Author's own compilation from various States' SEZ Act/Policy obtained from www.sezindia.nic.in)

Analysis and Interpretation of Result

Before moving for panel regression analysis, among all the explanatory variables, pair wise correlation test is conducted to check whether there exists any multicollinearity or not. The result of correlation is given in Table 7. Pair wise correlation matrix shows, investment in SEZ is positively related with state of the economy (11%), labour availability (7%), availability of energy (39%) and existence of SEZ Act/Policy (44%). As none of the pair among any of the variables is highly correlated (0.80<), it may be said that the problem of multi-collinearity does not exists

Table 7: Correlation Matrix

	INVT	NSDP	AVALLB	ENERGY	SEZAP
INVT	1.00				
NSDP	0.11	1.00			
AVALLB	0.07	-0.30**	1.00		
ENERGY	0.39**	0.19*	0.24*	1.00	
SEZAP	0.44**	0.12	-0.21	0.05	1.00

(Source: Author's own computation using Eviews 11; Notes: ** and * indicates correlation is significant at the 1% and 5% (2-tailed) respectively)

However, to check the severity of multicollinearity, Variance Inflation Factor (VIF) is computed as shown in Table 8. The VIF value for all variables is less than 10, and the tolerance value (1/VIF) is more than 0.10. This demonstrates that although multicollinearity exists, is not significant.

Table 8: VIF Computation

Variable	VIF	1/VIF
NSDP	4.84	0.207
AVALLB	2.38	0.420
ENERGY	5.69	0.176
SEZAP	1.81	0.552

(Source: Author's own computation using Eviews 11)

Next, the equation (2) is regressed in pooled model (OLS). The result of OLS model is shown in **Table 9**. The results validate that state of the economy, availability of labour in that state and infrastructure of the state does not have significant impact on investment made in SEZs in any state. However, it is significantly dependent on State SEZ Act/Policy. The effect of cross-section and time has also been tested through Breusch Pagan (BP) test and the results are reported in **Table 10**. The result of the test indicates that there exists only cross-section effect (p-value is less than 5%) and time has no effect. The p-value of combined effect comes to less than 5% and hence null hypothesis of BP test is rejected. Next the equation (2) is again estimated with Random Effect Model (REM). The result of REM is also shown in **Table 9**.

Table 9: Panel Data Regression Result

Dependent Variable = INVT			
Variables	OLS	Random Effect	Fixed Effect
NSDP	0.00 (0.00)	4.14 (0.00)	4.46 (0.00)
AVALLB	0.60 (0.82)	0.91 (0.81)	0.74 (0.92)
ENERGY	0.42 (0.12)	0.54 (0.47)	0.15 (1.09)
SEZAP	983.45*** (187.65)	930.15 *** (372.95)	-
Constant	-3884.74*** (1921.90)	-4021.09 *** (2804.76)	1812.88 (3711.08)
Observations	121	121	121
R squared	0.34	0.35	0.13

(Source: Author's own computation using Eviews 11. Notes: The symbols ***, **, and * denote significance at minimum 1%, 5%, and 10%, respectively. Standard errors are shown by figures in brackets.)

Table 10: Result of Breusch Pagan (BP) Test

Cross Section	Time	Both
27.45 (0.000)	0.766 (0.381)	26.78 (0.000)

(Source: Author's own computation using Eviews 11. Note: Figures in parenthesis are probability values.)

The REM confirms no significant influence is there of all the regressors, except SEZ Act/policy of state, on dependent variable. The coefficients of all the variables are positive; thus indicates, the positive effect of variables in bringing the investment in SEZs. The fixed effect model shows no significant impact of any of the regressors on investment. However, all the variables have a positive value. To check the suitability of model, Hausman Test is carried out with the null hypothesis that REM is appropriate than Fixed Effect Model (FEM). As the p-value of Hausman Test comes to more than 5%, null hypothesis is accepted and confirms that **REM is appropriate techniques in the present case**. The result of Hausman Test is given in **Table 11**.

Table 11: Result of Hausman Test

Chi-Sq. Statistic	Chi-Sq. d.f.	Prob
1.11	3	0.918

(Source: Author's own computation using Eviews 11)

Policy Recommendation

Based on analysis and interpretation of results in previous section, it is recommended to bring state SEZ Act and Policy by respective state governments. Further, State Governments may be encouraged to amend state SEZ Act/Policy to have more clarity on fiscal and non-fiscal benefits and to bring investment in SEZs.

Conclusion

The present study established that State SEZ Act/Policy has significant impact to bring SEZ investment in any state. However, state of the economy, infrastructure of the state and availability of labour though have positive impact in bringing SEZ investment, are not significant variables. Further, the study finds regional concentration of SEZ investment and more particularly in some developed and coastal states. As the basic objective of SEZ is to export of goods and services, selection of coastal states is justified for manufacturing sector. However, state of Odisha and West Bengal even after having coastal region could not bring much of investment in SEZs. States with no SEZ Act/Policy could not achieve much in bringing investment. States like Haryana, Telangana and Karnataka being technology hub and having skilled work-force have attracted large amount of investment in IT/ITeS sector.

The environmental, social, and governance (ESG) performance of a nation's industrial base can be improved via modern SEZs. In SEZs, controls and enforcement as well as support services (such as, health services, waste management, and renewable energy installations) can be offered more readily and affordably. High ESG standards are becoming a more important factor in new zones' competitiveness. The adoption of digital technology, advanced robotics, 3-D printing, big data, and the internet of things across industries is altering the manufacturing sector. SEZs will be significantly impacted by the falling weight of labor costs as an investment location factor.

The state government must be clear about its SEZ policy. Many of the decade old policy is neither updated nor replaced with time. Moreover, in the public domain the policy is not available vividly. The government's policy should be transparent and unambiguous. As land is subject matter of state government, it should provide all necessary support in acquisition and establishment of SEZ. Overlapping procedures for clearances in state government departments may be eliminated. This may be done only by clear operating/approval guideline or procedures. At last, target may be fixed by the respective government to bring SEZ investment in the comparative advantage industry.

Thus, the present study contributes to the policy makers who can reframe or design policies to attract investment decisions in SEZs of large corporates or MNCs. The study can further be elaborated by incorporating more microeconomic variables.

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Product Diversification Patterns In India-Asean Trade Post-Aifta

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Abstract

This study examines the patterns of product diversification in India-ASEAN trade relations during 2011-2019, focusing on the period following the implementation of the ASEAN-India Free Trade Agreement (AIFTA). Using the Gini-Hirschman Index (GHI) and correlation analysis, the research reveals significant asymmetries in the evolution of export and import diversification patterns. The findings demonstrate a concerning trend in export diversification, evidenced by a significant positive correlation ($r = 0.52$, $p < 0.001$) between export growth and concentration levels. This relationship suggests a structural tendency toward increased concentration as export volumes grow, particularly evident in major trading relationships such as with Singapore, where concentration in specific commodities persists at high levels (GHI: 60.21-72.31). Conversely, import relationships demonstrate a more favorable trajectory, characterized by a significant negative correlation ($r = -0.65$, $p < 0.001$) between import values and concentration levels. This pattern suggests that import relationships naturally diversify as they mature, exemplified by Thailand's consistently low GHI values (11.23-18.44) and Singapore's substantial improvement in import diversification (GHI declining from 51.61 to 21.26). The study identifies several critical barriers to export diversification, including structural impediments from established trade networks, market access barriers, and policy-related constraints. However, success stories like Indonesia's improvement in export diversification (GHI declining from 66.96 to 35.24) suggest that these barriers can be overcome with appropriate policy interventions. The research contributes to the literature on regional trade integration by highlighting the asymmetric impacts of trade agreements on export and import diversification. The findings suggest that while import diversification may progress naturally under liberalized trade regimes, export diversification requires more targeted and comprehensive policy interventions. The study proposes policy recommendations focusing on export promotion mechanisms, regulatory harmonization, supply chain integration, institutional support frameworks, and technology adoption to enhance trade diversification between India and ASEAN.

Keywords: Trade Diversification, ASEAN-India Free Trade Agreement, Export Concentration, Regional Integration, Product Diversification Index

Introduction

Background

India and the Association of Southeast Asian Nations (ASEAN) share a rich history of cultural, economic, and political interactions that have evolved significantly over the decades. Rooted in shared historical ties and geographical proximity, their trade relationship has matured into one of strategic importance. Established in 1967, ASEAN has transitioned from a modest regional agreement to a dynamic intergovernmental organization comprising ten Southeast Asian nations. Its objectives emphasize economic integration, political stability, and cultural exchange, aligning well with India's interests in the region.

India's engagement with ASEAN gained momentum with the introduction of the "Look East Policy" in 1991, marking a strategic shift in India's foreign relations. This policy aimed to strengthen economic ties with Southeast Asia, driven by the need to revive India's economy amidst a Balance of Payments crisis and the disintegration of the USSR. Over the years, the relationship deepened, with India becoming a sectoral dialogue partner in 1992, a full dialogue partner in 1996, and eventually a summit-level partner in 2002.

Key milestones include the signing of the ASEAN-India Framework Agreement on Comprehensive Economic Cooperation in 2003 and the implementation of the ASEAN-India Trade in Goods Agreement (AITIGA) in 2010 also known as ASEAN-India Free Trade Agreement (AIFTA). These agreements facilitated significant tariff reductions, boosting trade volumes. However, challenges like trade imbalances, high tariffs on Indian goods, and infrastructural barriers persist. The "Act East Policy," introduced in 2014, marked a further strategic enhancement, aiming to deepen India's engagement with ASEAN across economic, cultural, and security dimensions. Today, ASEAN is a vital partner for India, contributing significantly to its trade portfolio, while India plays a key role in

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ASEAN's economic diversification strategies, particularly in counterbalancing China's growing influence in the region. Despite current challenges, both entities continue to explore avenues for deeper integration, focusing on mutual benefits and sustainable growth.

Problem Statement

Despite the robust trade relations, there is an over-reliance on a narrow range of products or sectors within the India-ASEAN trade framework, creating significant vulnerabilities for both economies in dynamic and uncertain global markets. A substantial portion of trade is dominated by a few sectors such as petroleum products, electronic goods, and select agricultural commodities, leading to a high level of trade concentration (World Trade Organization, 2020). This concentration exposes both India and ASEAN countries to external shocks like price volatility, geopolitical disruptions, and sector-specific downturns. For instance, during the COVID-19 pandemic, economies heavily reliant on narrowly focused exports experienced sharp contractions in trade volumes (UNESCAP, 2021).

Such concentrated trade patterns hinder the development of broader economic capabilities, limiting opportunities for technological advancement and participation in high-value global supply chains (Balassa, 1982). Empirical studies have consistently demonstrated that diversifying export baskets contributes to enhanced economic resilience and improved growth trajectories, particularly for emerging economies (Imbs & Wacziarg, 2003; Cadot et al., 2011). While India's agricultural trade with ASEAN is comparatively diversified on the export side, imports remain more focused, potentially undermining long-term trade stability (Pandey, 2019). Additionally, limited diversification in sectors such as intermediate goods and high-value manufacturing highlights missed opportunities for deeper integration into ASEAN's dynamic regional supply chains (Mukherjee, 2016). Therefore, there is a pressing need for strategic diversification to ensure sustainable growth and economic resilience in India-ASEAN trade.

Objectives of the Study

The primary objective of this study is to examine the extent of diversification in the import and export of intensively traded commodities between India and ASEAN and to identify strategies to enhance this diversification post AFTA period. To achieve this, the study will analyze current trade patterns to determine the levels of commodity diversification or concentration, assessing whether trade is spread across a wide range of products or limited to a few key items. It will also evaluate historical trends to understand if diversification has progressed or stagnated over time, providing insights into the dynamics of trade evolution between the two regions. Additionally, the study aims to identify the barriers limiting diversification, such as policy constraints, infrastructural challenges, and market dynamics that may hinder the expansion into new commodity areas. By addressing these factors, the study seeks to propose strategic recommendations and actionable policies that can promote diversification, enhance trade resilience, and yield mutual economic benefits for both India and ASEAN member states.

Significance of the Study

This study holds significant importance for policymakers, businesses, and academia. For policymakers, understanding the risks associated with trade concentration can inform strategic decisions to invest in diversified sectors, enhancing economic resilience and sustainable growth. Businesses can benefit by identifying new market opportunities and adjusting their strategies to mitigate risks associated with sector-specific downturns. For academia, the study contributes to the literature on international trade diversification, providing empirical evidence on the India-ASEAN context.

By embracing diversification, both India and ASEAN can mitigate risks and enhance mutual economic complementarities, solidifying their roles as key players in a multipolar global economy. The study's insights can facilitate collaborative mechanisms that integrate trade facilitation, knowledge-sharing, and capacity-building initiatives, unlocking underexplored potential in India-ASEAN trade relations (OECD, 2021).

Literature Review

Historical Context of India-ASEAN Trade

The trade relationship between India and the Association of Southeast Asian Nations (ASEAN) has evolved significantly since the early 1990s. The establishment of the ASEAN-India Partnership in 1992 marked the beginning of formal economic engagement between the two regions. Initially characterized by limited trade

volumes, the partnership gained momentum with the signing of the ASEAN-India Framework Agreement on Comprehensive Economic Cooperation in 2003, which laid the groundwork for future trade liberalization efforts (ASEAN Secretariat, 2020).

A pivotal development was the implementation of the ASEAN-India Free Trade Agreement (AIFTA) in 2010, aiming to eliminate tariffs on over 80% of traded goods. This agreement substantially increased bilateral trade volumes, with studies documenting significant growth post-AIFTA (Chandran, 2015). However, scholars have noted that this growth has been concentrated in a few key sectors, including petroleum products, textiles, and machinery (World Bank, 2020; Banik & Kim, 2020). While ASEAN has become India's fourth-largest trading partner, the trade relationship often appears skewed, with ASEAN nations offering diversified imports compared to India's concentrated export structure (Pandey, 2019).

Historical analyses underscore that the foundation of India-ASEAN trade relations is rooted in geographical proximity, shared cultural heritage, and complementary economic structures (Das, 2014). Despite these favorable conditions, a consistent theme in the literature is the lack of diversification in traded commodities, which has limited the potential of bilateral trade to adapt to global economic shifts and exploit emerging opportunities (Kumar, 2019). Recent studies emphasize the need for policy interventions to expand trade into emerging sectors such as pharmaceuticals, digital technology, and renewable energy, which remain underexploited despite significant potential (Mukherjee & Bhattacharya, 2021; Gupta, 2019).

Theoretical Framework

Trade diversification is underpinned by several economic theories that link diversified trade portfolios with enhanced economic resilience and growth. Classical theories, such as Ricardo's theory of comparative advantage, advocate for specialization based on relative efficiency but also caution against the risks of over-reliance on a narrow range of exports (Ricardo, 1817). The Heckscher-Ohlin model suggests that nations export goods that intensively use their abundant factors, but as economies develop, they often seek to diversify their exports to mitigate risks associated with market volatility (Ohlin, 1933).

Modern theoretical frameworks, such as the "Stages of Diversification" proposed by Imbs and Wacziarg (2003), posit a non-linear relationship between economic development and diversification. In the early stages of development, economies tend to diversify their production and export structures, leading to increased economic stability and growth. As they reach higher income levels, a re-specialization in high-value-added sectors often occurs, leveraging advanced technologies and skills.

Hirschman's (1958) "Linkage Theory" further emphasizes that diversification creates forward and backward linkages within the economy, fostering industrialization and reducing vulnerability to sector-specific shocks. Cadot et al. (2011) formalized the relationship between export diversification and macroeconomic stability, demonstrating that countries with more diversified export baskets experience lower output volatility and higher long-term growth rates.

These theoretical perspectives provide a foundation for analyzing the India-ASEAN trade relationship, highlighting the importance of diversification in enhancing economic resilience, promoting sustainable growth, and integrating into global value chains.

Empirical Studies on Diversification

Empirical research consistently affirms the benefits of trade diversification for emerging economies. Imbs and Wacziarg (2003) found that diversification contributes to macroeconomic stability and is associated with higher income levels. Similarly, Cadot et al. (2011) provided evidence that countries with broader export bases are less susceptible to external economic shocks, underscoring the importance of diversification in the context of globalization.

In the context of India-ASEAN trade, several studies have analyzed trade patterns to identify challenges and opportunities for diversification. Mukherjee and Bhattacharya (2021) examined trade data and concluded that sectors such as pharmaceuticals, information technology services, and renewable energy technologies present significant untapped potential for diversification. Despite India's comparative advantages in these sectors, they remain underrepresented in trade with ASEAN countries.

Banik and Kim (2020) utilized the Revealed Comparative Advantage (RCA) index to assess India's export structure to ASEAN, finding a heavy reliance on traditional sectors like textiles and pharmaceuticals. They

highlighted the need for India to diversify its exports to include more value-added products and services. Similarly, Pandey (2019) observed that while ASEAN countries offer a diversified range of imports to India, India's exports to ASEAN remain concentrated, leading to trade imbalances and limiting the potential for deeper economic integration.

Challenges to diversification have also been documented. Kumar (2019) pointed out structural constraints such as inadequate infrastructure, regulatory barriers, and policy mismatches that hinder the expansion of trade into new sectors. Ghoshal and Ghosh (2019) emphasized that over-reliance on a limited set of products increases vulnerability to external shocks, as evidenced during global economic crises when concentrated economies faced sharper downturns.

Empirical studies suggest that enhancing trade facilitation measures, investing in capacity-building programs, and improving connectivity are critical to overcoming barriers to diversification (UNESCAP, 2021). Gupta (2019) argued that by leveraging digital technologies and participating in regional value chains, India could significantly diversify its exports and strengthen its trade position in the ASEAN region.

Overall, the literature converges on the necessity of moving beyond traditional sectors to harness the full potential of India-ASEAN trade relations. Diversification not only enhances economic resilience but also aligns with broader goals of sustainable development and integration into global value chains.

Research Methodology

Research Design

The study employs a quantitative approach to analyze the dynamics of India-ASEAN trade relations, particularly focusing on trade diversification. The study is based on secondary data spanning 2011 to 2019, sourced from the International Trade Center (ITC), Geneva: Bilateral trade data. The choice of 2011 as the starting year ensures the inclusion of the full effects of the ASEAN-India Free Trade Agreement (AIFTA) implemented in 2010. The study avoids 2020 onward to exclude pandemic-related anomalies in global trade patterns.

Data Analysis Techniques

For the entire study period GDP deflator will be used to convert nominal values into the real ones.

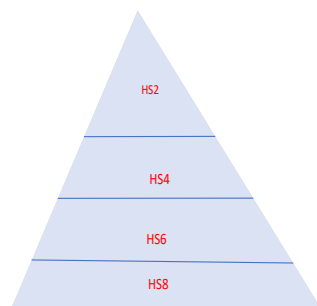
The formula of GDP deflator is as follows

$$GDP\ Deflator = \frac{Nominal\ GDP}{Real\ GDP} * 100$$

The formula to use GDP deflator to convert nominal values into a real value is as follows—

$$Real\ Value = \frac{Nominal\ Value}{GDP\ deflator} * 100$$

For the study, the commodities are chosen at HS 4-digit classification. The HS disaggregation level of commodities can be shown with the help of the following diagram



In the above diagram we can see that at further disaggregation level, the range of commodities under disaggregated classification goes wider and wider. The reason for choosing a higher aggregation level like HS 4 is because in such a case more commodity groups are covered and the analysis becomes more reflective. However, in HS 4 classification there are more than thousands of commodities or commodity groups so, practically tallying all the commodities is not feasible considering time and data constraints, so among the commodities, it is required to

choose only those commodities which reflected trade between India-ASEAN in a more promising way. Therefore, a proper choice mechanism requires for this purpose.

The mechanism that for the study is based on Yeates's (1997) Regional Intensity of Trade index. This index shows the intensity of trade between two parties for commodities relative to the rest of the world. The index lies between 0 and ∞ , suggesting an index greater than 1, intensive nature of trade.

The index is as follows

$$R_{ij}^k = \frac{X_{ij}^k / X_k^i}{X_{ij} / X^i}$$

Where X_{ijk} be country i 's exports of good k to country j , X_{ij} refers to country i 's all export to country j , X_{ik} refers to country i 's export of k to the world, X_i refers to country i 's export of all commodities aggregate to the world.

This index can be computed from the import side as well.

Those commodities are selected both from the import and export side, which have been showing consistently an index over 1 for the study period, meaning that for the particular commodity, the trade is intensive so the commodity chosen under the criteria will be reflective of trade intensity between India-ASEAN. The list of the selected commodities is provided in annexure 1.

For calculating product diversification, Gini-Hirschman Index (GHI) is calculated. This index quantifies the concentration level of products or markets in a country's trade. The index is calculated using the following formula:

$$GHI = 100 \sqrt{\sum_{j=1}^n \left(\frac{X_{jt}}{X_t} \right)^2}$$

Where X_{jt} is the export (or import) value of a specific product j in period t .

X_t is the total export (or import) value in period t .

The GHI ranges from a minimum value $100/\sqrt{n}$ where n is the number of different products or markets, to a maximum value of 100, indicating extreme concentration (only one product or market). A high GHI value indicates high concentration and low diversification and low GHI value indicates low concentration and high diversification.

To determine whether there is any relationship between export/import value and GHI value the study undertakes the Pearson correlation coefficient (r) between export/import and GHI. This coefficient measures the strength and direction of the linear relationship between the two variables. The Pearson correlation is chosen because it provides a direct measure of the linear association, which aligns with the initial visual observations.

To determine whether the observed correlation is statistically significant, I have conducted a hypothesis test on the Pearson correlation coefficient:

Null Hypothesis (H_0): There is no linear relationship

Alternative Hypothesis (H_1): There is a linear relationship

To test the hypothesis t-test is used

$$t_{n-1} = \frac{\bar{d}}{\sqrt{\frac{s^2_d}{n}}}$$

Where n-1 is the degrees of freedom

\bar{d} is the mean of differences

s^2_d is the sample variance of the differences

n is the number of observations

Analysis of Product Diversification Patterns in India-ASEAN Trade

Export Diversification Analysis

India's exports to ASEAN (Table 4.1) show considerable volatility over the study period, declining from USD 18,676,865.9 thousand in 2011 to USD 14,456,888 thousand in 2019. The pattern isn't linear, with the lowest value recorded in 2015 (USD 11,674,053 thousand) followed by a recovery phase. This volatility in aggregate exports provides important context for understanding concentration patterns. Notably, the period coincides with shifts in export shares among ASEAN partners, suggesting ongoing realignment of trade relationships.

Table 4.1- India-ASEAN export during 2011-2019 (In USD thousands)

	2011	2012	2013	2014	2015	2016	2017	2018	2019
Indian export to									
Brunei	643854.019	7604.74	9007.692	9464.413	14960.72	11557.4	20660.51	14156.78	12129.5
Cambodia	8638.28025	7997.045	15892.08	15164.52	22644.93	13724.34	9344.154	22885.34	14526.06
Indonesia	3628948.71	3156627	2769846	2182273	1379425	1550468	1413024	2104247	2419159
Laos	2753.15445	8657.307	13875.36	25255.78	17277.11	3477.662	1656.906	4916.771	5188.09
Malaysia	1389455.98	1585581	2503039	2380930	2625318	2222374	3158600	3907662	2851167
Myanmar	41431.0282	49371.63	27180.43	38649.15	33512.81	45989.43	127419.6	463927.2	227962.3
Phillipines	234764.54	223261.4	224013.3	357153	335172.5	391564.3	399475.4	405773.1	290907.2
Singapore	10626939.9	8958376	8790220	5826917	3884294	4254149	7886353	6445321	6347450
Thailand	572071.975	734316.1	935840.4	1024212	855428	652897.9	764082.2	885805.6	738537
Vietnam	1528008.33	1639309	2488650	2937572	2506020	2755656	3184291	2342610	1549863
Total	18676865.9	16371102	17777564	14797590	11674053	11901859	16964907	16597306	14456888

Source: Prepared by the author from ITC database

The volatility in export values might help explain the tendency toward concentration during growth periods. When export growth occurs in an uncertain environment, firms might focus on their most established products and markets, leading to higher concentration.

The analysis of India's export diversification to ASEAN reveals complex patterns characterized by significant country-specific variations.

Table 4.2- Year and country wise export diversification

	Year	2011	2012	2013	2014	2015	2016	2017	2018	2019
Brunei	GHI	95.9	69.21	70.23	71.54	74.5	68.4	69.29	67.2	66.31
Cambodia	GHI	40.08	42.95	46.32	43.59	41.19	42.3	40.82	49.3	38.66
Indonesia	GHI	66.97	51.33	58.82	52.68	44.93	30.3	30.17	33.1	35.25
Laos	GHI	68.49	97.25	91.41	72.26	73.57	44.9	49.59	69.4	52.89
Malaysia	GHI	39.8	35.19	48.18	48.27	43.17	39.6	55.67	67.1	53.02
Myanmar	GHI	64.96	54.22	34.28	29.5	28.85	29.6	49.93	64.5	51.87

Philippines	GHI	42.15	40.82	41.03	53.68	53.24	57.9	58.76	59.4	56.35
Singapore	GHI	70.6	69.82	71.21	68.21	64.5	65.6	72.31	67.2	60.21
Thailand	GHI	35.3	40.45	42.31	43.11	41.3	40.4	41.61	42.3	38.61
Vietnam	GHI	45.5	44.45	52.41	55.22	52.3	51.5	53.56	49.3	48.41

Source: Prepared by the author

Brunei reveals extremely volatile export patterns, with the highest value recorded in 2011 (USD 643,854.019 thousand) followed by a dramatic decline (Table 4.1). The GHI values range from 66.31 to 95.85 (Table 4.2), indicating high concentration. This concentration is particularly evident in 2011, where 98% of exports were concentrated in commodities like HS codes 8428, 8430, 8901, 8905, 9002, and 9015.

Cambodia exhibits fluctuating export patterns without a clear trend. The GHI values range from 38.66 to 49.29 (Table 4.2), with the highest diversification observed in 2019. Notably, while 2018 saw the largest export value, it also showed the highest concentration (GHI: 49.3), demonstrating the trade-off between export growth and diversification.

Indonesia shows a notable trend toward improved diversification, with GHI values declining substantially from 66.96 in 2011 to 35.24 in 2019 (Table 4.2). The export pattern shows significant fluctuations (Table 4.1), with the highest value in 2011 coinciding with the highest concentration, suggesting successful later diversification efforts.

Laos demonstrates highly volatile export patterns with extreme concentration levels. GHI values range from 44.90 to 97.24 (Table 4.2), with 2012 showing the highest concentration where a single commodity (0202) accounted for 97% of exports.

Malaysia presents increasing concentration over time, with GHI values rising from 39.80 in 2011 to 53.01 in 2019 (Table 4.2). Table 4.2 shows significant export growth, particularly between 2016 and 2018, but this growth coincided with increased concentration, especially in commodity 2710.

Myanmar shows dramatic export growth, particularly during 2016-2018 (Table 4.1). The GHI values fluctuate significantly, ranging from 28.84 to 64.96 (Table 4.2), with the lowest concentration in 2015 followed by increasing concentration during the high-growth period.

Philippines demonstrates a general upward trend in exports (Table 4.1) with GHI values ranging from 40.82 to 59.43 (Table 4.2). The analysis shows an inverse relationship between export diversification and value, with higher exports typically accompanying higher concentration.

Singapore maintains the largest share of Indian exports to ASEAN but shows high concentration levels with GHI values between 60.21 and 72.31 (Table 4.2). Table 4.1 illustrates volatile export patterns, with concentration primarily in commodity 2710 (63-71% of exports).

Thailand maintains moderate diversification levels with GHI values ranging from 35.32 to 43.11 (Table 4.2). Table 4.1 shows steady export growth from 2011 to 2014, followed by fluctuations, with diversification levels remaining relatively stable.

Vietnam shows substantial export growth until 2017 followed by decline. GHI values range from 44.45 to 55.22 (Table 4.2), indicating moderate to high concentration levels correlating with export volumes.

The statistical analysis reveals a significant positive correlation ($r = 0.52$) between export values and GHI levels, with a t-statistic of 8.24 ($p < 0.001$) and a 95% confidence interval of (0.353, 0.655) as shown in Table 4.3.

Table 4.3 Pearson correlation result

Statistic	Value
Pearson Correlation Coefficient	0.52
t-Statistic	8.24
p-Value	<0.001
95% Confidence Interval	(0.353, 0.655)
Number of Observations	90

Source: Calculated by the author

The correlation coefficient of 0.52 suggests a moderate to strong positive relationship between export growth and concentration. The high t-statistic (8.24) and low p-value (<0.001) provide strong evidence against the null hypothesis of no relationship, indicating that the observed correlation is highly unlikely to have occurred by chance.

Import Diversification Analysis

India's imports from ASEAN (Table 4.19) show a more stable upward trend, increasing from USD 22,659,649.4 thousand in 2011 to USD 30,211,139 thousand in 2019. This represents a more consistent growth pattern compared to exports, with temporary declines only in 2015-2016.

Table 4.4- India-ASEAN import during 2011-2019 (In USD thousands)

	2011	2012	2013	2014	2015	2016	2017	2018	2019
Indian import from									
Brunei	9.211666	6.780529	31.82656	2.402542	16.87736	30.33438	252.2692	927.3521	9.359185
Cambodia	6115.38076	5518.246	4024.245	3477.334	24391.66	21242.5	19280.31	15547.71	7817.925
Indonesia	10259250.3	11253355	12733603	13526861	12349707	11018720	14453210	14379079	12515495
Laos	55.4503613	164.8855	488.373	4591.695	29415.13	10774.36	12625.72	2399.041	955.413
Malaysia	4044066.91	5443295	4909523	5796675	6194833	5472345	5547986	5306384	6145741
Myanmar	1213416.76	1425508	1471553	1575182	1196594	1265111	847450.8	538813.4	509015.1
Phillipines	142093.695	153796.1	136804.1	167448.4	190326.4	168197.2	262749.1	256900.1	229558.2
Singapore	4281152.08	3064273	3165046	3353111	3669536	3445012	3448341	5720971	5583446
Thailand	2272005.8	2436971	2480855	2882739	2952849	2839240	3259786	3547423	2796158
Vietnam	441483.835	631328.1	838382.1	810343.1	932971.1	1227971	1424820	2020070	2422943
Total	22659649.4	24414216	25740311	28120431	27540640	25468644	29276502	31788513	30211139

Source: Prepared by the author from ITC database

The steady growth in imports aligns with the observed pattern of increasing diversification, suggesting that stable trade growth might facilitate product diversification.

As in the above table we can see that country Brunei, Cambodia and Laos had a very minimalistic share so from the analysis these three countries are excluded.

Table 4.5 Year and country wise import diversification

	Year	2011	2012	2013	2014	2015	2016	2017	2018	2019
Indonesia	GHI	47.5	46.8	46.2	45.7	46.3	47.1	45.1	45.3	46.1
Malaysia	GHI	35.8	34.26	36.57	35.56	35.3	36.1	36.61	35.9	35.52
Myanmar	GHI	48.5	48.26	47.51	45.11	69.3	67.1	71.37	73.6	74.41
Philippines	GHI	28.5	27.36	28.57	25.11	24.4	30.4	28.47	31.4	33.26
Singapore	GHI	51.6	40.01	30.33	25.26	25.4	22.4	21.57	20.4	21.26
Thailand	GHI	18.3	15.56	15.33	13.36	14.5	18.4	17.39	11.2	12.51
Vietnam	GHI	26.4	24.16	24.23	24.59	23.2	22.1	22.64	20.4	19.33

Source: Prepared by the author

Indonesia as the largest import source, maintains stable diversification with GHI values between 45.10 and 47.50 (Table 4.5). Table 4.4 shows consistent import growth with occasional fluctuations, demonstrating stable diversification despite volume changes.

Malaysia shows relatively stable diversification with GHI values ranging from 34.26 to 36.61 (Table 4.5). Table 4.4 illustrates fluctuating import patterns, with diversification generally improving during periods of import growth.

Myanmar demonstrates declining import trends (Table 4.4) with increasing concentration, as shown by rising GHI values from 45.11 to 74.41 (Table 4.5).

Philippines maintains high diversification levels with GHI values between 24.36 and 33.26 (Table 4.5). Table 4.4 shows overall import growth with fluctuations, accompanied by relatively stable diversification.

Singapore shows dramatic improvement in import diversification, with GHI values declining from 51.61 to 21.26 (Table 4.5). Table 4.4 illustrates significant import volatility, particularly the sharp increase in 2018.

Thailand emerges as the most diversified import source with remarkably low GHI values ranging from 11.23 to 18.44 (Table 4.5). Table 4.4 shows steady import growth with high diversification maintained throughout.

Vietnam demonstrates consistent diversification improvement with GHI values declining from 26.43 to 19.33 (Table 4.5), alongside strong and consistent import growth.

The import analysis reveals a contrasting pattern with a significant negative correlation ($r = -0.65$) between import values and GHI levels, supported by a t-statistic of -5.83 ($p < 0.001$) and a 95% confidence interval of (-0.75, -0.55) as shown in Table 4.6.

Table 4.6 Pearson correlation result

Statistic	Value
Pearson Correlation Coefficient	-0.65
t-Statistic	-5.83
p-Value	<0.001
95% Confidence Interval	(-0.75, -0.55)
Number of Observations	63

Source: Calculated by the author

The correlation coefficient of -0.65 indicates a strong negative relationship between import growth and concentration. The t-statistic of -5.83 and p-value <0.001 provide robust evidence of a significant negative relationship between import values and concentration levels.

4.3 Statistical Validation and Implications

The contrasting statistical relationships between trade volumes and diversification in exports and imports provide crucial insights into the dynamics of India-ASEAN trade. These opposing patterns suggest fundamental differences in how export and import relationships evolve within the India-ASEAN trade framework.

The tendency toward concentration in exports (positive correlation) likely reflects several underlying factors. First, as export volumes grow, Indian firms appear to specialize in products where they have established competitive advantages. This is particularly evident in the case of Singapore, where commodity 2710 dominates the export basket, accounting for 63-71% of exports. Such specialization might result from economies of scale, established market networks, or specific bilateral trade arrangements. The pattern is also visible in Malaysia's case, where increasing export values coincided with rising GHI values from 39.80 in 2011 to 53.01 in 2019.

The concentration tendency in exports might also reflect market access barriers or specific demand patterns in ASEAN countries. For instance, the high concentration in exports to Brunei suggests limited market penetration across diverse product categories. This could be due to competitive pressures, non-tariff barriers, or specific market requirements that favor certain product categories over others. As Goreczky, 2022 studied that market-specific demand, regulatory barriers, or established trade networks, limits India's role in ASEAN's supply chains concentrating in few products and sectoral engagement.

In contrast, the negative correlation in imports suggests that increased import volumes facilitate greater product diversification. This pattern might emerge from several mechanisms. First, higher import volumes likely indicate broader engagement with ASEAN suppliers across different industries. Thailand's case exemplifies this,

maintaining remarkably low GHI values despite substantial import growth. This suggests that as trade relationships mature, Indian importers become more adept at sourcing diverse products from ASEAN markets.

The import diversification pattern might also reflect the success of trade liberalization under AIFTA in reducing barriers across multiple product categories. Singapore's dramatic improvement in import diversification, with GHI values declining from 51.61 to 21.26 demonstrates how reduced trade barriers can facilitate diversification. Similarly, Vietnam's consistent improvement in import diversification alongside strong import growth suggests that newer trade relationships can develop in a more diversified manner under the current trade regime. Earlier research also found that maintaining open trade policies may suffice to sustain healthy import diversification, as evidenced by the success of partners like Thailand and Vietnam (Bhowmik, 2019).

The asymmetry between export and import diversification patterns has important implications for trade policy. The natural tendency toward export concentration suggests that achieving export diversification may require targeted interventions. These could include:

- Export promotion in non-traditional product categories
- Development of new competitive advantages across different industries
- Addressing specific market access barriers in ASEAN countries
- Support for smaller exporters to enter ASEAN markets

Conversely, the organic improvement in import diversification suggests that maintaining open trade policies and reducing trade barriers might be sufficient to maintain healthy import diversification. The success stories of Thailand, Singapore, and Vietnam in maintaining or improving import diversification provide models for enhancing trade relationships with other ASEAN partners.

These statistical relationships therefore reveal not just patterns in trade data, but fundamental aspects of how India-ASEAN trade relationships evolve. The tendency toward export concentration appears to be a structural feature of the current trade relationship, possibly reflecting both market forces and policy constraints. Meanwhile, the consistent pattern of import diversification suggests that the institutional framework of AIFTA may be more effective at facilitating diverse import relationships than at promoting export diversification.

Diversification trend post AIFTA period

The temporal analysis of India-ASEAN trade diversification reveals distinct evolutionary patterns characterized by notable asymmetry between export and import trajectories during 2011-2019. The empirical evidence demonstrates that export diversification has largely stagnated or deteriorated, while import diversification has exhibited consistent improvement across most trading partnerships.

The historical trajectory of export diversification presents concerning patterns, evidenced by the significant positive correlation ($r = 0.52$, $p < 0.001$) between export growth and concentration. This statistical relationship indicates a structural tendency toward higher concentration as trade volumes increase, suggesting a systematic deterioration rather than progression in export diversification over time. This pattern is particularly pronounced in India's relationship with Singapore, its largest export destination, where concentration levels remained persistently high with GHI values ranging from 60.21 to 72.31. However, some relationships demonstrate potential for diversification. Indonesia presents a notable exception, showing substantial improvement in export diversification with GHI values declining from 66.96 to 35.24. This successful case suggests that structural barriers to diversification can be overcome under appropriate conditions. Conversely, smaller trading partners like Brunei and Laos exhibited extreme concentration levels, with GHI values reaching 95.85 and 97.24 respectively, highlighting the particular challenges faced in developing diversified trade relationships with smaller economies.

In contrast, import diversification demonstrates more positive historical development, characterized by a significant negative correlation ($r = -0.65$, $p < 0.001$) between import values and concentration. This relationship suggests that import partnerships naturally diversify as they mature. Thailand exemplifies this pattern, maintaining consistently high diversification with GHI values between 11.23 and 18.44. Similarly, Singapore's import relationship showed substantial improvement, with GHI values declining from 51.61 to 21.26, while Vietnam demonstrated steady diversification progress as GHI values fell from 26.43 to 19.33.

Barriers to trade diversification

Structural impediments emerge from established trade networks and economies of scale, exemplified by the dominance of specific commodities such as product code 2710 in Singapore exports. These entrenched patterns create path dependencies that resist diversification efforts, a phenomenon consistent with previous studies indicating that India's exports to ASEAN are characterized by limited structural changes and a focus on a narrow range of high-volume products (Gulnaz and Manglani, 2023). Market access barriers, including non-tariff measures and regulatory requirements, further compound these challenges, as seen in high export concentration levels to countries like Brunei. Such constraints reflect similar findings that emphasize the restrictive impact of non-tariff measures on India's ability to fully capitalize on export potential to ASEAN nations (Khati and Kim, 2022).

Policy-related asymmetries are evident in the differential impact of the ASEAN-India Free Trade Agreement (AIFTA) on export and import diversification. While AIFTA has effectively facilitated diverse import relationships, it has struggled to promote export diversification. This reflects broader patterns identified in the literature, where FTAs significantly reduce import costs but have a less pronounced impact on exports, partly due to entrenched comparative advantages and market-specific demand preferences (Trung et al., 2018). Market dynamics also exacerbate these challenges, as competitive pressures and entrenched preferences for specific export categories limit diversification opportunities (Joseph and Hari, 2019).

The findings suggest that while import diversification progresses organically within the existing institutional framework, export diversification requires targeted policy interventions. Successful import diversification, as seen in the ASEAN context, underscores the institutional effectiveness of AIFTA. However, persistent challenges in export diversification point to structural barriers and policy gaps, such as limited market access and insufficient export promotion measures, that require immediate attention (Mondal and Sirohi, 2016). These insights highlight the need for tailored strategies that balance maintaining liberalized import regimes with addressing unique barriers to export diversification, providing a framework for enhancing trade resilience and diversification patterns.

Conclusion and Policy recommendation

This study examines trade diversification patterns between India and ASEAN during 2011-2019, revealing significant asymmetries in the evolution of export and import relationships post-AIFTA implementation. The empirical evidence demonstrates a concerning trend in export diversification, characterized by a significant positive correlation ($r = 0.52$, $p < 0.001$) between export growth and concentration. This relationship suggests a structural tendency toward increased concentration as export volumes grow, particularly evident in major trading relationships such as with Singapore, where concentration in specific commodities persists at high levels (GHI: 60.21-72.31).

Conversely, import relationships demonstrate a more favorable trajectory, evidenced by a significant negative correlation ($r = -0.65$, $p < 0.001$) between import values and concentration levels. This pattern suggests that import relationships naturally diversify as they mature, exemplified by Thailand's consistently low GHI values (11.23-18.44) and Singapore's substantial improvement in import diversification (GHI declining from 51.61 to 21.26). The contrasting patterns indicate that while AIFTA has effectively facilitated diverse import relationships, its impact on export diversification has been limited.

The findings identify several critical barriers to export diversification, including structural impediments from established trade networks, market access barriers, and policy-related constraints. The persistence of high concentration in exports to smaller ASEAN economies (e.g., Brunei's GHI reaching 95.85) highlights the particular challenges faced in developing diversified trade relationships with emerging markets. However, success stories like Indonesia's improvement in export diversification (GHI declining from 66.96 to 35.24) suggest that these barriers can be overcome with appropriate policy interventions.

Based on these findings, several policy interventions emerge as crucial for enhancing trade diversification. First, policymakers should focus on developing comprehensive export promotion mechanisms that specifically target non-traditional product categories and emerging sectors. This approach should be complemented by market intelligence systems that can identify and capitalize on new export opportunities within ASEAN markets. Second, regulatory harmonization emerges as a critical area for policy intervention. The study suggests that streamlining compliance procedures and enhancing transparency in non-tariff measures could significantly facilitate export diversification. This should be pursued through bilateral and multilateral mechanisms within the AIFTA framework. Third, supply chain integration requires strategic policy attention. The analysis indicates that deeper integration into ASEAN value chains could enhance export diversification. This necessitates policies that promote investment in export-oriented manufacturing facilities and strengthen logistics linkages with ASEAN countries.

The success of import diversification in countries like Thailand and Vietnam provides valuable models for such integration. Fourth, institutional support frameworks need strengthening, particularly for SME exporters entering ASEAN markets. The evidence suggests that smaller firms face significant barriers in diversifying their export baskets, indicating the need for specialized financing schemes and capacity-building programs focused on new export sectors. Fifth, technology and innovation support emerges as a crucial policy area. The findings indicate that sectors with higher technological content show greater potential for diversification. Therefore, policies should promote technology adoption in export-oriented industries and facilitate collaboration with ASEAN partners in emerging sectors.

The study's findings contribute significantly to the literature on regional trade integration by highlighting the asymmetric impacts of trade agreements on export and import diversification. The evidence suggests that while import diversification may progress naturally under liberalized trade regimes, export diversification requires more targeted and comprehensive policy interventions. This understanding is crucial for policymakers seeking to enhance the effectiveness of regional trade agreements in promoting balanced and diversified trade relationships.

Future research could explore sector-specific dynamics of diversification and the role of global value chains in shaping trade patterns between India and ASEAN. Additionally, investigating the specific mechanisms through which successful cases like Indonesia achieved improved export diversification could provide valuable insights for policy formulation.

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