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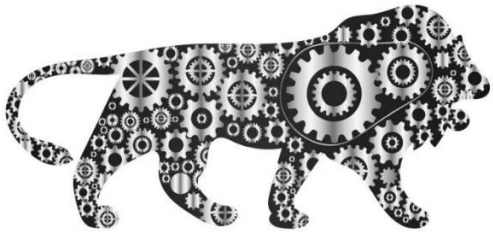

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Thriving in the Digital Era: Adoption of Digital Technology by Small and Medium Enterprises in Northern India

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Abstract
The purpose of this study was to investigate the variables influencing SME entrepreneurs' use of digital technologies. Data from 375 samples of SME entrepreneurs in the northern area of India were gathered using questionnaires. The Structural Equation Model (SEM) was used to examine the data. The findings demonstrated that there were three primary elements to the variables influencing the adoption of digital technology by SMEs: the technological context, the context of SMEs, and the environment. One of the main elements influencing how beneficial people think utilizing digital technology is its technological background. The primary element that influences entrepreneurs' acceptance of digital technology and their perception of its usability is the surrounding environment. The study's findings can serve as a roadmap for encouraging and supporting Indian SME owners to embrace digital technology to boost their competitiveness in the market and prepare for the coming era of the digital economy.

Keywords: *Digital technology, Technology adoption, SMEs.*

Introduction

Since digital technology has made life and work more efficient, the economic structure has changed into the digital economy, which offers prospects for expansion and drastically alters corporate procedures, ushering in the fourth industrial revolution. With the advent of digital technology, the idea of doing business has evolved from mass manufacturing for cost reduction to customized production or from creating chances for virtual goods and services in a virtual environment. According to forecasts of the World Economic Forum, the digital economy will account for almost 70% of the world's gross domestic product (GDP) by 2030. This prediction indicates that digital technology will continue to have a significant influence on the direction of the world economy. An economy that utilizes digital technology to boost economic value is known as a "digital economy," which includes producers, consumers, and governments.

According to an EY survey in 2019, 81% of ASEAN entrepreneurs intend to invest in digital technology-related factors, and 80% of the sample is working to ensure that organization personnel are trained in the latest technologies. In contrast, the percentage of entrepreneurs in the region who still invest in fixed assets or traditional technology has dropped to about 75%. Additionally, the World Manufacturing Production statistics shows that the use of digital technology by entrepreneurs contributed to a 2.5% rise in productivity in the manufacturing sector globally in 2023 compared to a 2.3% gain in 2018.

Despite the fact that digital technology may provide businesses a competitive edge, there are still issues and barriers when it comes to using it in SMEs. Twelve issues have been identified by the Office of Small and Medium Enterprises Promotion (OSMEP) as the challenges facing India's SMEs. The impediments to manufacturing technology are one of the main issues or challenges facing SMEs. Productivity, or the efficiency of manufacturing, is directly impacted by this issue.

In order to create cost leadership—which is the use of technology to reduce costs—the government has a policy to support and focus on SMEs using digital technology to modify and apply in business operations to create speed of adjustment and release new products and services to meet customer needs. Examples of this technology-driven cost reduction include solving overstock problems, reducing production errors, shortening customer delivery times, and differentiating products and services through application of technology to the business. The Office of Small and Medium Enterprises Promotion (OSMEP) survey data from 2019 revealed, however, that one of the shortcomings of India's SMEs is that conventional business owners are unaware of the value and use of digital technologies. The current business model might not last in the long run. Therefore, one of the key components of a company's ability to survive in the market is its adoption of digital technology for use in operations. It plays a significant role in giving Indian SME owners a competitive advantage over their rivals in the market, or at the very least, in keeping them competitive. Consequently, it is critical to upgrade SMEs through the use of digital technology, which gives rise to the research question, "What are the factors affecting the adoption of digital

technology in SMEs?" with the goal of examining these issues.

Literature Review

In the field of technology and innovation management, the Technology Acceptance Model (TAM) is a commonly used paradigm for technology and innovation that arises, spreads, or is generally accepted and employed in society (Davis, 1989). The variables influencing India's SMEs' adoption of digital technology were examined in this study using the Technology Acceptance Model (TAM) (Nurqamarani, Soegiarto & Nurlaeli, 2021). The study of variables that affect how new goods, innovations, technologies, and so forth are adopted and used is the foundation of the Technology Acceptance Model (TAM).

The term "external variables" describes the impact of several external factors on the perceived utility (PU) and perceived ease of use (PEOU) of innovations, information technology, and other related technologies. If these views are true, it will influence attitudes about adopting technology and ultimately lead to the acceptance of innovations, information technology, or technology (King & He, 2006). The perceived utility and ease of use of breakthroughs in technology, information technology, and other fields are influenced by several external factors. The Technology-Organization-Environment (TOE) paradigm developed by Tornatzky and Fleisher, which outlined the elements of technology adoption or the processes involved in making adoption decisions, was also employed in this study. Technology, organization, and environment are the three primary parts (Tornatzky & Fleisher, 1990; Chong & Olesen, 2017). These three elements are regarded as exogenous variables that impact the perceived utility of technology, information technology, or innovation, as well as the perceived usability of technology, information technology, or innovation that prompts SME entrepreneurs in India to adopt digital technology. A summary of the conceptual framework is provided in Figure 1.

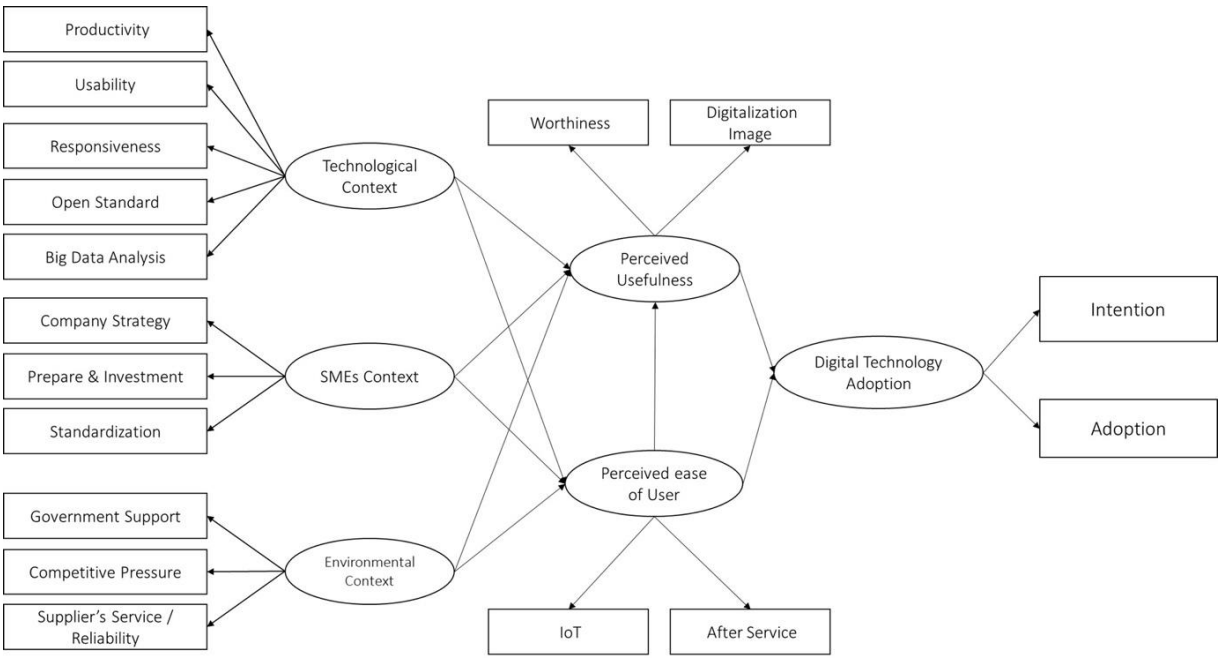

Figure 1: Research Model

Methodology

The study's methodology may be broken down into the following four primary steps:

- On the basis of literature review of two theories were utilized in this investigation comprises the Technology-Organization-Environment concept for research model development and the Technology Adoption Theory Model (TAM).
- After reviewing several relevant papers and speaking with subject-matter experts, the questionnaire was developed and revised. The questionnaire was made up entirely of closed-ended questions. the process of designing research instruments or questionnaires by incorporating elements from the conceptual framework and research modeling procedure.

- C. Data Gathering and Analysis: This research is quantitative in nature. The population was made up of SME owners in India who were chosen at random using a sampling technique. 375 SME entrepreneurs from northern India who took part in the Small Entrepreneur Upgrading Project using Digital Technology in 2024 are included in the demographic. Using Maximum Likelihood, the sample size was established in accordance with Lindeman, Merenda, and Gold's (1980) guidelines. The information gathered from the distribution of the questionnaire was used to assess the study results. In order to have a more comprehensible combination and structural equation modeling (SEM) analysis, variables were grouped and existing variables were increased or decreased using exploratory factor analysis (EFA).
- Conclusion: The study findings were compiled and drawn after the data were examined.

Results and Discussion

A correlation test called exploratory factor analysis (EFA) determines how many groupings of factors that represent latent variables may be formed from observable data. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy, or KMO, was one of the criteria utilized in the study to demonstrate the applicability of the data. The resultant number needs to be at least.5. (2) The Whole Variance Confirmation of the extent to which a component may characterize the data is explained. A value that indicates how variables should be distributed across the composition is the Rotated Component Matrix (3). The resultant value cannot be less than.5.

Every value that was received complied with the given requirements. It may be concluded that the information was usable. Seven components made up the analysis results: 1) Context of technology; 2) Context of company SMEs; 3) Context of the environment; 4) Perception of utility; 5) Perception of ease of use; and 7) Adoption to Use. Every component met the requirements of the Exploratory Factor Analysis (EFA). Table 1 presents the data.

Table 1: Results of EFA analysis

Factor	KMO (>0.5)	Approx. Chi-Square	Total Variance Explained (>65)	df	Sig.
Technological Context	.618	3647.15	73.065	55	.000
SMEs context	.684	2614.640	85.315	28	.000
Environmental Context	.654	4469.147	90.879	28	.000
Perceived Usefulness	.762	923.196	71.547	6	.000
Perceived ease of use	.773	2509.316	81.672	6	.000
Digital Technology Adoption	.780	847.388	69.422	6	.000

The resulting factors were used in the Structural Equation Model (SEM), a statistical analysis type, after the use of the exploratory component analysis. In order to create consistency with the studied model, it was utilized to verify the research hypothesis, demonstrate the relationship in the form of path analysis, and evaluate the relationship between latent variables and observed variables, both directly and indirectly, by using exploratory component analysis to examine the relationship between variables.

The Goodness-of-fit, a model indicator designed to be consistent and relevant to the study's environment, shows the model's appropriateness analysis. It has to have a range of values so that the model fits correctly. The requirements are that the p-value must be.05 (*),.01 (**), and.001 (***), and the CMIN/df must be less than 2 (Ozlem et al., 2017), GFI is larger than.9 (Zhengwei et al., 2017), AGFI must be greater than.9 (Yıldırım et al., 2017), and RMSEA must be less than.05 (Kwon and Shin, 2016). As seen in Table 2, the coherence of the models was evaluated by modifying the statistical values to match between a theoretical model and an empirical model (Tathem et al., 2006).

Table 2: Goodness-of-fit-indices and measure

Measurement indices	Recommended value	Value
CMIN/df	< 2	1.953 (acceptable)
GFI	≥ 0.9	0.921 (acceptable)
AGFI	≥ 0.9	0.964 (acceptable)
RMSEA	< 0.05	0.038 (acceptable)

The model was then examined using the structural equation modeling method to test the model's hypothesis, which was ascertained from the Regression Weights table by taking into account the Standardize Regression Weights of less than 1.00 and the P-Value at the significance level of.001 (***). Table 3 illustrates the link between the variables through the results of the model adjustment using an advanced statistical tool.

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Table 3: Results of EFA analysis

Parameter			Standardized	Sig.
PU	<---	Technological Context	.458	***
PEOU	<---	Technological Context	.269	***
PU	<---	SMEs Context	.340	**
PEOU	<---	SMEs Context	.269	***
PU	<---	Environmental Context	.142	***
PEOU	<---	Environmental Context	.355	**
PU	<---	PEOU	.509	***
Digital Technology Adoption	<---	PU	.247	***
Digital Technology Adoption	<---	PEOU	.492	***

Note: *** >.001, ** >0.1, * >.05

An analytical method for examining the causal link between independent and dependent variables is path analysis. The following succinctly describes the link between latent and observable variables: 1) Together, perceived utility and perceived ease of use had an impact on digital technology adoption of 31% (R2 = 30.59), with perceived utility having the greatest coefficient (.492***) and perceived ease of use having the second-highest coefficient (.247***). 2) The combined effects of the technological, SME, and environmental contexts influence the perceived usefulness by 51% (R2 = 51.40). 3) The combined impact of the technological, SME, and environmental contexts on perceived ease of use is 39% (R2 = 39.10). The information is displayed in Figure 3.

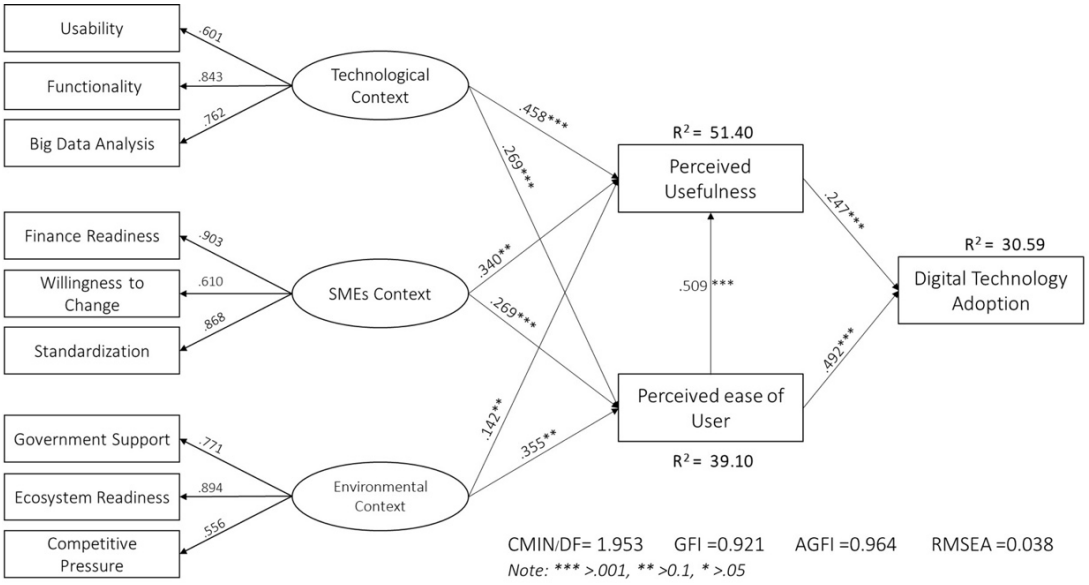

Figure 3: Relationship of Digital Technology in SMES

Conclusion and Recommendation

The purpose of this study was to investigate the variables influencing SME entrepreneurs' use of digital technologies. The statistical analysis's findings demonstrated that, in order to help SMEs recognize the value of utilizing digital technology, government organizations and the private sector involved in the policy of encouraging and supporting SMEs' use of digital technology should concentrate on informing and training SMEs on how to use each type of digital technology that is appropriate for each SMEs. Additionally, in order to raise awareness of the ease of using digital technology by SMEs and prevent them from viewing it as a burden or an obstacle, the government should support both in terms of knowledge and skill development, funding access, and ecosystem development. If both of these are put into practice, it will result in modernizing the existing company with a new business plan that would improve operations and boost efficiency. Along with raising income and productivity for businesses, it may also cut expenditures. One possible place to start when adopting it is with 1) the effectiveness and capabilities of digital technology. It needs to motivate SMEs to acknowledge and appreciate the

significance of digital technology, which may efficiently assist in problem-solving, save expenses, and boost productivity and revenue in the corporate world. In order to prevent adding to the burden of entrepreneurs, the government should also assist in giving such training and information to company owners and assist SMEs in selecting digital technology that is appropriate for the kind of SMEs and the size of the enterprise. 2) The public sector should possess the know-how to assist SMEs in their digital transformation by assisting in the analysis of the issues with the current system and offering guidance on the transfer to the new one. 3) Advocate for the complete use of digital technologies.Apart from utilizing digital technology, it is important to impart expertise on data gathering and analysis. Additionally, keeping diverse data in a database for subsequent processing and analysis in the form of big data analysis is necessary for company planning that caters to consumers' and the market's demands.

References

Abrahao, R.S., Moriguch, S.N. & Andrade, D.S. (2016) 'Intention of adoption of mobile payment: An analysis in the light of the Unified Theory of Acceptance and Use of Technology (UTAUT)', Science Direct RAI Revista de Administracao Innovation, vol. 13, pp. 221–230.

Aggorowati, M.A., Iriawan, N., Suhartono & Gautama, H. (2012) 'Restructuring and Expanding Technology Acceptance Model Structural Equation Model and Bayesian Approach', American Journal of Applied Sciences, vol. 9, no. 4, pp. 496–504.

Al-Maroof, R.A.S. & Al-Emran, M. (2018) 'Students' Acceptance of Google Classroom: An Exploratory Study using PLS-SEM Approach', International Journal of Emerging Technologies in Learning (iJET), vol. 13, no. 6, pp. 112–123.

Alshammari, K.A.F. (2018) 'Computer Anxiety of The Digital Technologies Acceptance in Saudi Arabia', International Journal of Heritage, Art and Multimedia, vol. 1, no. 3, pp. 32–50.

Alzubi, M.M., Al-Dubai, M.M. & Farea, M.M. (2018) 'Using the technology acceptance model in understanding citizens' behavioural intention to use m-marketing among Jordanian citizens', Journal of Business and Retail Management Research (JBRMR), vol. 8, no. 5, pp. 37–49.

Amin, M.K., Azhar, A., Amin, A. & Akter, A. (2015) 'Applying the Technology Acceptance Model in examining Bangladeshi consumers' behavioral intention to use Mobile Wallet: PLS-SEM Approach', 18th International Conference on Computer and Information Technology (ICCIT), pp. 94–96.

Asadi, S., Abdullah, R., Safaei, M. & Nazir, S. (2019) 'An Integrated SEM-Neural Network Approach for Predicting Determinants of Adoption of Wearable Healthcare Devices', Mobile Information Systems, vol. 5, no. 1, pp. 4–8.

Bacha, M.P., Čeljob, A. & Zoroja, J. (2016) 'Technology Acceptance Model for Business Intelligence Systems: Preliminary Research', Procedia Computer Science, vol. 100, pp. 995–1001.

Brezavscek, A., Sparl, P. & Znidarsic, A. (2016) 'Factors Influencing the Behavioural Intention to Use Statistical Software: The Perspective of Slovenian Students of Social Sciences', EURASIA Journal of Mathematics, Science and Technology Education, vol. 13, no. 3, pp. 953–986.

Chen, H., Rong, W. & Ma, X. (2017) 'An Extended Technology Acceptance Model for Mobile Social Gaming Service Popularity Analysis', Mobile Information Systems, pp. 4–9.

Chong, J.L. & Olesen, K. (2017) 'A Technology-Organization-Environment Perspective on Eco-effectiveness: A Meta-analysis', Australasian Journal of Information Systems, vol. 21.

Cowan, P. & Earls, J. (2016) 'Using the Technology Acceptance Model to determine Teachers' Attitudes towards the Introduction of iPads in the Classroom', World Conference on Educational Media and Technology, pp. 921–926.

Diamond, L., Busch, M. & Jilch, V. (2018) 'Using Technology Acceptance Models for Product Development: Case Study of a Smart Payment Card', AIT Austrian Institute of Technology, no. 6.

Erdogmus, N. & Esen, M. (2011) 'An Investigation of the Effects of Technology Readiness on Technology Acceptance in e-HRM', Procedia Social and Behavioral Sciences, vol. 24, pp. 487–495.

EY (2019) Redesigning for the digital economy: A study of SMEs in Southeast Asia.

Fajar, M.A. (2017) 'Exploratory Study of SMEs Technology Adoption Readiness Factors', Procedia Computer Science, vol. 124, pp. 329–336.

Farahat, T. (2012) 'Applying the Technology Acceptance Model to Online Learning in Egyptian Universities', Procedia - Social and Behavioral Sciences, vol. 64, pp. 95–104.

Fathema, N., Shannon, D. & Ross, M. (2015) 'Expanding the Technology Acceptance Model (TAM) to Examine Faculty Use of Learning Management Systems (LMSs) in Higher Education Institutions', MERLOT Journal of Online Learning and Teaching, vol. 11, no. 2, pp. 213–218.

Fedorko, I., Bacik, R. & Gavurova, B. (2018) 'Technology Acceptance Model in E-commerce Segment', Management & Marketing, vol. 13, no. 4, pp. 1242–1256.

Govindaraju, R. & Indriany, A. (2007) 'A study on ERP System Acceptance based on Technology Acceptance Model', Bandung Institute of Technology.

Harborth, D. & Papet, S. (2017) 'Exploring the Hype: Investigating Technology Acceptance Factors of Pokémon Go', IEEE International Symposium on Mixed and Augmented Reality (ISMAR), Nantes, France.

Hornbaek, K. & Hertzum, M. (2017) 'A Review of the Experiential Component in HCI', ACM Transactions on Computer-Human Interaction, vol. 24, no. 5, pp. 33–6.

Juwita, J. (2017) 'Analysis of Affecting Factors Technology Acceptance Model in The Application of Knowledge Management for Small Medium Enterprises in Industry Creative', Procedia Computer Science, vol. 116, pp. 500–508.

King, W.R. & He, J. (2006) 'A meta-analysis of the technology acceptance model', Information & Management, vol. 43, no. 6, pp. 740–755.

King, W.R. & He, J. (2006) 'A meta-analysis of the technology acceptance model', Information & Management, vol. 43, no. 6, pp. 740–755.

Khongmalai, O. & Distanont, A. (2018) Research Techniques in Technology and Innovation Management, Thammasat Publisher, India'sland.

Lixandroiu, R.C. (2019) 'A study on academic staff personality and technology acceptance: The case of communication and collaboration applications', Computers & Education, vol. 128, pp. 113–131.

Maican, C.I., Cazan, A. & Lixandroiu, R.C. (2019) 'A study on academic staff personality and technology acceptance: The case of communication and collaboration applications', Computers & Education, vol. 128, pp. 113–131.

Melesse, B. (2018) 'A review on factors affecting adoption of agricultural new technologies in Ethiopia', Journal of Agricultural Science and Food Research, vol. 9, pp. 4–9.

Munoz-Leiva, F., Climent-Climent, S. & Cabanillas, L. (2016) 'Determinants of intention to use mobile banking apps: An extension of the classic TAM model', Spanish Journal of Marketing - ESIC, vol. 21, pp. 25–38.

Mutlu, S. & Efeoglu, I.E. (2013) 'Evaluation of E-mail usage by extended technology acceptance model', International Review of Management and Marketing, vol. 3, no. 3, pp. 112–121.

Nurqamarani, A.S., Soegiarto, E. & Nurlaeli (2021) 'Technology adoption in small-medium enterprises based on Technology Acceptance Model: A critical review', Journal of Information Systems Engineering and Business Intelligence, vol. 7, no. 2, p. 162–172.

San, A.C. & Yee, C.J. (2013) 'The modified Technology Acceptance Model for private clinical physicians: A case study in Malaysia, Penang', International Journal of Academic Research in Business and Social Sciences,

February, p. 387.

Schepers, J.J. & Wetzels, M. (2007) 'A meta-analysis of the technology acceptance model: Investigating subjective norm and moderation effects', Information & Management, vol. 44, pp. 90–103.

Scherer, R., Siddiq, S. & Tondeur, J. (2019) 'The technology acceptance model (TAM): A meta-analytic structural equation modeling approach to explaining teachers' adoption of digital technology in education', Computers & Education, vol. 128, pp. 13–35.

Scott, S.D., Plotnikoff, R.C. & Karunamuni, N. (2008) 'Factors influencing the adoption of an innovation: An examination of the uptake of the Canadian Heart Health Kit (HHK)', Implementation Science, vol. 3, no. 41, p. 2008.

Sukarno, M., Meilani, M.L. & Karyanti, Y. (2017) 'Smartphone adoption by the National Population and Family Planning Indonesia', National Population and Family Planning Board (BKKBN) Indonesia, pp. 4–10.

Talukder, M. (2012) 'Factors affecting the adoption of technological innovation by individual employees: An Australian study', Procedia - Social and Behavioural Sciences, vol. 40, pp. 52–57.

Teo, T. & Zhou, M. (2014) 'Explaining the intention to use technology among university students: A structural equation modeling approach', Journal of Computer in Higher Education, vol. 26, pp. 124–142.

The Office of Small and Medium Enterprises Promotion (OSMEP) (2021) Executive Summary White Paper on MSME 2020, Bangkok, Thailand.

Tornatzky, L.G. & Fleischer, M. (1990) The Processes of Technological Innovation, Lexington Books, Lexington, MA.

Wairimu, M.B. & Nyaoga, R.B. (2018) 'The effect of automated information systems on the Kenyan county government's operations', Accounting, vol. 4, p. 105.