MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 36 Issue 1, 2026, Pages 6513-6517

A Study on the Usage of Information Technology (IT) Tools and identify the scope for further up-gradation in MSMEs at Coimbatore District

Dr. A. Sandhya[1], Dr. Venkatalakshmi[2], Dr. K. Arun Vidya[3], Dr. S. Thilaga[4], Dr. A. G. Sudha[5], Dr. J. Deepa[6], Dr.R.Naveenkumar[7]

[1] Assistant Professor, PSG College of Technology, PSG Institute of Management, Coimbatore. sanasok.23@gmail.com
[2] Assistant Professor, PSG College of Technology, PSG Institute of Management, Coimbatore. venkatalakshmirajaram3@gmail.com
[3] Assistant Professor, Sri Ramakrishna College of Arts and Science for Women, Coimbatore.aruna@srcas.ac.in
[4] Assistant Professor, Coimbatore Institute of Technology, Coimbatore
thilaga.s@cit.edu.in
[5] Assistant Professor, Coimbatore Institute of Technology, Coimbatore
sudha.ag@cit.edu.in
[6] Assistant Professor, Coimbatore Institute of Technology, Coimbatore
deepaj@cit.edu.in
[7]Associate Professor, School of Engineering and Technology, CGC University, Mohali - 140007, Punjab, India., drnk1983@gmail.com

Abstract
The Adoption of e- procurement is relatively low amongst the Micro, Small, and Medium Enterprises (MSMEs) despite their immense role in the development of the economy and industrial growth. E-procurement operations in most of the MSMEs remain limited to simple IT applications and most of them mainly make use of simplistic digital procurement tools. This technological deficiency lessens the possible efficiency and transparency as well as strategic value that can be provided by digital procurement systems. The lack of suitable digital infrastructure, high cost of implementation and maintenance, lack of skilled personnel, risks of cyber attacks, and complicated regulatory systems are the key obstacles to successful adoption. Coimbatore District, one of the industrial hubs in the country, does not have much empirical data evaluating the level of maturity regarding the adoption of e-procurement and digital preparedness of MSMEs. This is a limitation to evidence-based policy development and strategic managerial interventions due to the absence of region-specific study. The current research aims at studying the applications of IT tools in e-procurement in the form of adoption and utilisation with the application of e-procurement tool with the primary data based on 548 respondents in the MSME. The study takes a quantitative approach where descriptive statistics, Analysis of Variance (ANOVA), and factor analysis are used to determine the trends of adoption and the determinants. The article adds empirically significant information on the digital procurement readiness of MSMEs, builds up on the literature on technology adoption, and aids in the creation of policy. The results will be used to develop specific skill development initiatives, enhance the digital infrastructure support.
Keywords: E-Procurement, Information Technology, MSMEs, Digital Transformation, Procurement Automation, IT Upgradation

1. Introduction

1.1 Significance of the Study

The manufacturing economy of India is dominated by micro, small and medium enterprises (MSMEs) especially in the industrial centers like Coimbatore that have large business networks in industries like textile, engineering and food processing [1]. MSMEs play an important role of job creation, GDP growth and regional economic development. employment generation, growth in the GDP and growth in the region economy. As the complexity of global supply chains and competitive demands continue to rise, these companies are bound to implement digital transformation in the main business operations like procurement [2].

The application of Information and Communication technologies (ICT) to facilitate the purchasing process via websites has been adopted as an important tool in enhancing efficiency, cost reduction and collaboration with suppliers [3]. ICT which is a technology to automate purchasing procedures via websites, has emerged as an essential factor to efficiency, cost-reduction, and enhanced cooperation with suppliers [3]. ICT tools such as online purchasing applications, B2B selling platforms, trade exchanges and purchasing coalitions can help SMEs rationalize their processes, pool their buying power and seek new sources of sourcing [4]. Other advantages of adoption of e-procurement include reduction in order cycles, reduced administrative costs, less inventory levels, improved supplier cooperation and multi-chain operational efficiencies [5][6].

Online sales and e-commerce have essentially altered the way of business making organizations less production-focused and more customer-focused in their business strategies, and the way of business focus no longer on tangible goods but on services, data and intellectual resources [7][8][9]. Thus, in the digital age, any business that does not move to digital procurement and e-commerce technologies will see its competitors catching up and surpassing it [10]. As a result, amidst the age of information, the companies which do not adopt digital procurement and e-commerce technologies may be outcompeted [10].

1.2 Problem Identification

However, the proven advantages of e-procurement are such that, SMEs in developing countries are yet to adopt such technologies [11]. Research and successful implementation have concentrated mostly on large companies in the developed economies and lacked complete knowledge on SMEs in the emerging markets. SMEs have unique challenges that restrict their capacity to adopt strategies that are specific to larger firms such as scarcity in finances, centralized decision making, conservative management processes, and low levels of sales companies enterprises [12][13]. In such regions as Coimbatore, although MSMEs are an important element of the manufacturing ecosystem, they are rather sporadic and patchy in their use of e-procurement. Poor awareness, deficient technical infrastructure and uncertainty of the payoff of ICT solutions are the factors that have been contributing to low adoption rates. infrastructure and uncertainty of the payoff of ICT solutions are the factors that contribute to slow adoption rates. Hence, it is important to determine the factors that could impact SMEs in making decisions on e-procurement adoption that will contribute to policy formulation, as well as, its practical implementation. The choice of e-procurement by SMEs is crucial in designing the policies and in the actual application

1.3 Objectives of the Research

The primary objectives of this study are:
1.To evaluate the current adoption and usage of e-procurement systems by MSMEs in emerging economies, with a focus on Coimbatore.
2.To identify organizational, technological, and environmental factors that influence MSMEs' decisions to adopt e-procurement.
3.To assess the impact of e-procurement on operational efficiency, cost reduction, and supplier collaboration.

1.4 Contributions of the Study

This study makes several key contributions:
1. Provides an empirical understanding of e-procurement adoption in SMEs located in an emerging economy context.
2.Identifies critical factors affecting e-procurement adoption, including organizational readiness, technological infrastructure, and external pressures.
3.Bridges the gap between studies focused on large corporations in developed economies and SMEs in developing regions.
4.Offers actionable insights for policymakers, industry associations, and SME managers to facilitate digital transformation in procurement.

1.5 Paper Organization

The paper is structured in the following way. Section 2 will contain the literature review where the past research on e-procurement adoption, use of ICT applications, and challenges of SMEs in both global and national contexts are discussed. Section 3 describes the research methodology, the study design, data collection process, sample selection and the statistical analysis techniques that will be used in the study. Section 4 presents the results of the empirical study and has come up with a discussion of the factors affecting the adoption of e-procurement among MSMEs. Lastly, in Section 5, the conclusion is provided explaining the key findings, contributions of the research, and possible practice implications as well as future research.

Research Questions:
1.To what extent Information Technology (IT) tools are used in E-Procurement?
2.Are there any scopes for further up-gradation of Information Technology (IT) to support the E-Procurement process?

Research Hypothesis:
1 There is no significant difference between the year in industry and information technology tools used in the e-procurement process.
2.There is no significant difference between years of industry experience and the adoption of IT-based e-procurement tools among MSMEs

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 36 Issue 1, 2026, Pages 6513-6517

2. Literature Review

2.1 IT Adoption and Usage in SMEs. The use and adoption of IT tools in the SMEs has been examined in a number of studies, which note the importance of digital technologies in enhancing operational efficiency and competitiveness [11][12][13]. E-procurement, Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM) systems are also known to enable process optimization and cost-cutting in small and medium enterprises [14][15]. Studies have shown that SMEs that have been proactive in implementing IT tools have been witnessing shorter order cycle, improved inventory management and enhanced collaborations with suppliers [16][17]. Financial constraints, absence of skilled human resources, resistance to change, among others, in the environment of emerging economies tend to retard the adoption process [18][19]. However, ICT adoption has been associated with increased productivity and expansion of businesses in manufacturing hubs such as Coimbatore especially in such industries as textiles and engineering [20][21].

2.2 Scope for IT Upgradation in MSMEs. The Research have also been studied on the possibilities of further IT upgrading in SMEs, noting that it should be integrated systems that uphold multi-chain operations and data-driven decision-making[22]. Cloud-based solutions, digital marketplaces and mobile solutions give SMEs viable solutions to scale IT capabilities. marketplaces, and mobile solutions offer SMEs viable solutions to scale IT capabilities[23]. Also, government initiatives and policy support is important in ensuring that SMEs embrace modern technologies[24]. Research has shown that the businesses which take proactive efforts in upgrading their IT systems are not only able to optimize their internal efficiency, but also their competitiveness in regional and global markets is also increased[25].The literature indicates that the use of IT can help SMEs greatly in enhancing their operational efficiency, coordinating and decision-making with suppliers. Literature shows that adoption of IT will greatly increase the efficiency of operations, coordination with suppliers, and decision making of SME. Nevertheless, resource availability, technical expertise and system integration continues to be a challenge, particularly with the SMEs of an emerging economy, such as India. In this study, the findings are used to examine the existing utilization of IT tools in Coimbatore among MSMEs and determine the opportunities to further develop and upgrade the utilization of IT tools to enhance competitiveness and the performance of their businesses

3. Research Methodology.

The methodology examines the research design, data collection, sample selection, an analytical techniques used to examine the adoption and scope of Information Technology tools in digital procurement among MSMEs in the Coimbatore district.

3.1 Research Design. The study adopts a descriptive research design, aimed at providing a detailed understanding of the extent of IT tool usage and identifying areas for further upgradation in MSMEs. Descriptive research is appropriate as it allows for the collection of quantitative data on current practices, enabling statistical analysis and comparison of IT adoption levels across different organizational experience categories.

3.2 Data Collection Methods. Primary data were collected through a structured questionnaire administered to decision-makers, procurement managers, and IT heads of MSMEs.

3.3 Sample Selection. The population consisted of MSMEs operating in the textile, engineering, and food sectors of Coimbatore district. A purposive sampling technique was employed to select firms that actively use or plan to implement e-procurement systems.

•**Sample size:** 548 respondents
•**Inclusion criteria:** Firms with operational procurement departments and at least one IT system implemented for purchasing or supplier management
•**Exclusion criteria:** Micro-enterprises without structured procurement processes or IT systems

This approach ensured the sample was representative of MSMEs likely to use IT tools in procurement, while capturing variations in organizational experience and sector.

3.4 Analytical Techniques. The collected data were analyzed using the following methods:

1. Descriptive Statistics:

1. Mean and standard deviation were calculated to assess the extent of IT tool adoption across MSMEs.
2. Highlighted tools with higher adoption levels and identified areas needing improvement.

2. One-Way ANOVA (Analysis of Variance):

1. Used to examine whether organizational experience (years in industry) significantly influenced the adoption of IT tools.
2. Tested the null hypothesis (H_0): There is no significant difference between the year in industry and IT tool adoption.
3. Significance levels (p-values) below 0.05 were considered statistically significant.

3.5 Scope and Limitations. Scope: The methodology enables identification of current IT adoption levels, highlights gaps in reporting and analytics tools, and provides recommendations for digital upgradation in MSMEs.

Limitations:1.Study limited to MSMEs in Coimbatore district; findings may not generalize to other regions.
2.Self-reported responses may be subject to bias.
3.Small sample sizes in extreme experience categories (e.g., >40 years) require cautious interpretation.

4. Results and Discussion

4.1 Extent of IT Tool Usage in E-Procurement

The Study involved the use of IT tools in the e-procurement process on 548 MSME respondents in Coimbatore District. The descriptive analysis demonstrates that there is moderate and relatively high use of digital procurement tools and the means of values are between 2.15 and 2.34. The highest mean (M = 2.34), then, online purchasing auctions (M = 2.30), and EDI tools (M = 2.29) are the highest means; this implies a high level of digital operation in the operation. The lowest mean (M = 2.15) was recorded in reporting and control tools, indicating that there is very little use of advanced analytics. The research concludes that basic e-procurement tools are primarily used by MSMEs, and the use of advanced digital skills, infrastructure, and automation assistance is necessary.

Values of standard deviation between 0. The standard deviation of 0. 723-0.820 depicts moderate variability and reasonable regularity in the perception of the respondents on the use of IT tools in e-procurement. respondent's perception on use of IT tools in e-procurement. The findings agree with the Technology Acceptance Model (TAM) and the DeLone and McLean Information Systems Success Model, which indicate that the perceived usefulness and ease of use impact the adoption of technologies. Increased usability and functional efficiency of the operational procurement tools in the MSMEs depict a higher adoption of the tools. The findings also show that there is satisfactory quality of the system and information to support the use of digital procurement. quality to support use of digital procurement. Reporting and analytics tools however demonstrate lower adoption. analytical tools demonstrate lower adoption. This indicates the necessity of better performance monitoring and incorporation of data analytics in the procurement systems. a requirement to enhance performance monitoring and data analytics in the procurement systems. The provision of improved digital procurement will be beneficial towards long-term technology-based supply chain management.

4.1 Extent of IT Tool Usage in E-Procurement

Table 1: Usage of Information Technology (IT) Tools in E-Procurement

Descriptive Statistics					
Parameters	N	Minimum	Maximum	Mean	Std. Deviation
Material Management Syatem (Enterprise Resources Planning System)	548	1	3	2.22	.820
Reporting and Controlling Tool	548	1	3	2.15	.777
Electronic Data Interchange (EDI)	548	1	3	2.29	.754
Tool For Supplier Evaluation	548	1	3	2.34	.749
Catalogue Management Tool for Indirect Goods	548	1	3	2.25	.766
Desktop Purchasing of Indirect Goods	548	1	3	2.23	.769
Contract Management Tool for Direct Goods	548	1	3	2.25	.765
Online Invitation to Tender	548	1	3	2.27	.773
Online Purchasing Auctions	548	1	3	2.30	.738
Web-Platform for Scheduling & Planning with End Suppliers	548	1	3	2.26	.764
Web-Platform for Product Development with End Suppliers	548	1	3	2.28	.723
Valid N (listwise)	548				

Source: Primary Data

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 36 Issue 1, 2026, Pages 6513-6517

Interpretation:

The descriptive statistical results indicate a moderate to high level of adoption of IT tools in e-procurement processes among MSMEs in Coimbatore district, with mean values ranging from 2.00-2.15 tool adoption in e-procurement processes among MSMEs in Coimbatore District, with mean values ranging from 2. 15 to 2. 34 on a three-point scale. The highest adoption was observed for supplier assessment tools (M = 2. evaluation tools (M = 2. 34), suggesting that MSMEs prioritize efficient supplier selection, quality assurance and transparency in procurement transactions. selection efficiency, quality assurance, and transparency in procurement transactions. Next come online purchasing auction systems (M = 2. This was followed by online purchasing auction systems (M = 2. 30) and Electronic Data Interchange (EDI) tools (M = 2. 29), reflecting the increased reliance on digital communication and transaction processing in procurement activities. However, reporting and control tools record the lowest average value (M = 2. controlling tools recorded the lowest mean value (M = 2. 15), which indicates relatively limited use of advanced purchasing analysis and decision support systems. indicating relatively limited use of advanced procurement analytics and decision-support systems. The results reveal that MSMEs primarily adopt digital procurement tools at the operational level, while strategic and intelligence-driven procurement technologies are less used. findings reveal that MSMEs predominantly adopt operational-level digital procurement tools, while strategic and intelligence-driven procurement technologies are less utilised. . Overall, the findings highlight the existence of a digital maturity gap between basic use of e-procurement and advanced procurement system integration, highlighting the need for improved digital infrastructure, skills development and technology-driven procurement management.

ANOVA FOR YEAR IN INDUSTRY AND USAGE OF INFORMATION TECHNOLOGY TOOLS

H0: There is no significant difference between the year in industry and information technology tools used in the e-procurement process.

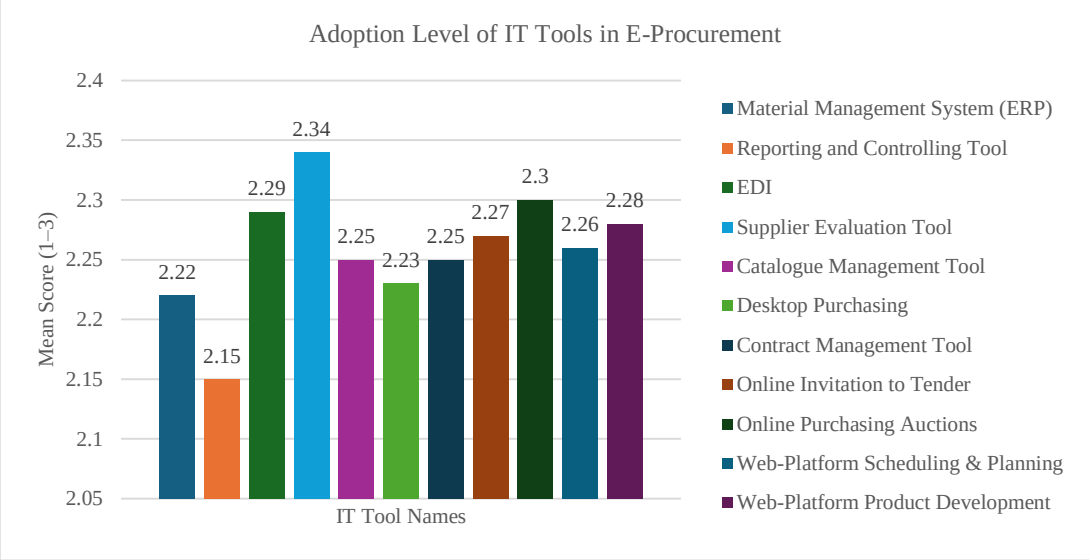

Figure 1 Usage of IT Tools in E-Procurement

Figure 1 illustrates the extent to which MSMEs in Coimbatore adopt various IT tools in their e-procurement processes. The chart clearly shows that Supplier Evaluation Tools, Online Purchasing Auctions, and Electronic Data Interchange (EDI) are the most widely adopted tools, reflecting a strong emphasis on supplier integration, transparency, and efficiency in digital transactions. In contrast, Reporting and Controlling Tools exhibit comparatively lower adoption, indicating a lesser focus on analytical and monitoring capabilities. The visualization of mean scores provides a clear comparison of adoption levels across different IT tools, highlighting areas where MSMEs have effectively leveraged technology and where further upgradation could enhance procurement performance.

4.2 Relationship Between Organizational Experience and IT Tool Usage

Table.2 Year In Industry And Usage Of Information Technology Tools

Parameters	Groups	N	Mean	Std. Deviation	F	Sig.
Material Management Module (Enterprise Resources Planning System)	Less than 5 years	94	1.91	.838	4.256	.001
	5-10 years	180	2.34	.785		
	11-20 years	159	2.25	.825		
	21-30 years	87	2.24	.806		
	31- 40 years	24	2.25	.794		
	Above 40 years	4	3.00	.000		
	Total	548	2.22	.820		
Reporting and Controlling Tool	Less than 5 years	94	1.96	.854	4.235	.001
	5-10 years	180	2.18	.734		
	11-20 years	159	2.11	.763		
	21-30 years	87	2.21	.809		
	31- 40 years	24	2.63	.495		
	Above 40 years	4	3.00	.000		
	Total	548	2.15	.777		
Electronic Data Interchange (EDI)	Less than 5 years	94	2.06	.840	4.110	.001
	5-10 years	180	2.41	.683		
	11-20 years	159	2.26	.757		
	21-30 years	87	2.24	.777		
	31- 40 years	24	2.54	.588		
	Above 40 years	4	3.00	.000		
	Total	548	2.29	.754		
Tool For Supplier Evaluation	Less than 5 years	94	2.13	.833	3.637	.003
	5-10 years	180	2.32	.751		
	11-20 years	159	2.48	.692		
	21-30 years	87	2.29	.761		
	31- 40 years	24	2.50	.511		
	Above 40 years	4	3.00	.000		
	Total	548	2.34	.749		
Catalogue Management Tool for Indirect Goods	Less than 5 years	94	1.98	.842	4.176	.001
	5-10 years	180	2.36	.648		
	11-20 years	159	2.24	.775		
	21-30 years	87	2.28	.831		

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 36 Issue 1, 2026, Pages 6513-6517

	31- 40 years	24	2.42	.776		
	Above 40 years	4	3.00	.000		
	Total	548	2.25	.766		
Desktop Purchasing of Indirect Goods	Less than 5 years	94	1.97	.782	4.207	.001
	5-10 years	180	2.31	.741		
	11-20 years	159	2.21	.772		
	21-30 years	87	2.30	.794		
	31- 40 years	24	2.50	.590		
	Above 40 years	4	3.00	.000		
	Total	548	2.23	.769		
Contract Management Tool for Direct Goods	Less than 5 years	94	2.02	.867	4.230	.001
	5-10 years	180	2.29	.699		
	11-20 years	159	2.18	.770		
	21-30 years	87	2.39	.737		
	31- 40 years	24	2.54	.658		
	Above 40 years	4	3.00	.000		
	Total	548	2.25	.765		
Online Invitation to Tender	Less than 5 years	94	2.04	.867	3.119	.009
	5-10 years	180	2.33	.717		
	11-20 years	159	2.26	.775		
	21-30 years	87	2.31	.782		
	31- 40 years	24	2.50	.590		
	Above 40 years	4	3.00	.000		
	Total	548	2.27	.773		
Online Purchasing Auctions	Less than 5 years	94	2.02	.829	4.691	.000
	5-10 years	180	2.37	.652		
	11-20 years	159	2.34	.728		
	21-30 years	87	2.30	.779		
	31- 40 years	24	2.58	.654		
	Above 40 years	4	3.00	.000		
	Total	548	2.30	.738		
Web-Platform for Scheduling & Planning with Suppliers	Less than 5 years	94	2.07	.806	3.564	.004
	5-10 years	180	2.33	.709		
	11-20 years	159	2.20	.802		
	21-30 years	87	2.28	.773		
	31- 40 years	24	2.63	.495		
	Above 40 years	4	3.00	.000		
	Total	548	2.26	.764		
Web-Platform for Product Development with Suppliers	Less than 5 years	94	2.06	.853	3.795	.002
	5-10 years	180	2.32	.689		
	11-20 years	159	2.30	.682		
	21-30 years	87	2.30	.717		
	31- 40 years	24	2.63	.495		
	Above 40 years	4	3.00	.000		
	Total	548	2.28	.723		

Source: Primary Data

Hypothesis

H0: There is no significant difference between years of industry experience and the adoption of IT-based e-procurement tools among MSMEs.

A one-way ANOVA was performed to test this hypothesis and it compared six categories of experience in organizations. The findings show that there were statistically significant differences in all modules of digital procurement because all the p-values were below 0.01 ($p < 0.01$). More precisely, a significant difference was found in the Material Management Module ($F = 4.256$, $p = .001$), Reporting and Controlling Tool ($F = 4.235$, $p = .001$), Electronic Data Interchange ($F = 4.110$, $p = .001$), Supplier Evaluation Tool ($F = 3.637$, $p = .003$), Catalogue Management ($F = 4.176$, $p = .001$), Desktop Purchasing ($F = 4.2$

These results prove the hypothesis that years of experience in an organization play a massive role in determining the extent of digital procurement adoption. There is distinct trend in which organizations that have a 5-10 years of experience and 11-20 years of experience recorded higher mean score than organizations with a less than 5 years of experience. The firms that have an experience of over 30 years show even greater adoption levels; the sample size being low ($N = 4$) in the Above 40 years category can be interpreted with caution. By and large, the findings suggest that the organization maturity has a positive impact on digital procurement implementation, which aligns with theoretical viewpoints of the Technology Acceptance Model and the Information Systems Success Model, which postulates that experience positively affects perceived usefulness, familiarity with the system, and use of the system effectively.

Scope for Upgradation: Although experienced organizations adopt operational tools more effectively, modules such as reporting and controlling, and analytical platforms still show relatively lower adoption. This highlights a clear opportunity for further IT upgradation, particularly in performance monitoring, data analytics, and decision support systems, to fully leverage digital procurement capabilities.

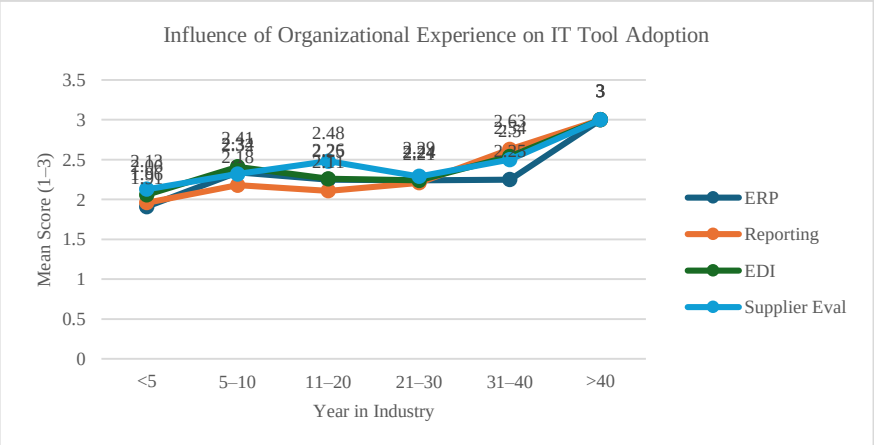

Figure 2 Year in Industry vs. IT Tool Usage

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 36 Issue 1, 2026, Pages 6513-6517

Figure 2 presents the relationship between years of organizational experience and the adoption of IT tools in e-procurement. The chart demonstrates a general trend where firms with 5–10 years and 11–20 years of experience report higher adoption levels across most IT tools compared to younger organizations with less than 5 years of experience. Additionally, organizations with more than 30 years of experience show even higher mean adoption scores, although the small sample size in the "Above 40 years" category warrants careful interpretation. This visualization emphasizes that organizational maturity positively influences digital procurement implementation, supporting theoretical perspectives from the Technology Acceptance Model and Information Systems Success Model, which suggest that experience enhances perceived usefulness, familiarity with IT systems, and effective utilization of digital tools.

5. Conclusion:

The study is about the use of IT Tools by MSMEs in Coimbatore district in their E-Procurement processes using 548 companies as study subjects. According to the results, MSMEs in Coimbatore District have moderate to high levels of operational procurement technology (many using supplier rating systems, electronic data interchange tools, and online auction platforms). At the same time, there is still a relatively low level of adoption with regards to a) Advanced Procurement Analytic Tools, and b) Reporting Tools. Taken together, the level of advanced procurement analytic and reporting tool usage reflects a digital maturity gap existing between operational procurement digitization (using simple technologies) and strategic procurement intelligence systems (using more complex technologies). The research also identified a significant gap in the literature on procurement digitalization at the tool level as much of the existing literature is focused on broad ICT adoption and not as focused on the patterns of e-procurement behaviour of industries in a particular region. The results of the study are circumscribed by the nature of the study, limited to the context of a single district, and may have a response bias related to the self-reported survey; Additionally, the sample of the respondents was unequally distributed over the experience categories may limit the generalizability of the results of this study. The Future recommendations include low cost e-procurement tool and Government related e-procurement training can enhance the efficiency of MSME at Coimbatore District.

References:

1. Owusu Kwateng, K., Manu, D., Tetteh, F. K., & Larbi, G. D. (2026). "Antecedents and Outcomes of E-Procurement Adoption: An Extension of the DeLone and McLean Information Systems Success Model", Journal of Systems and Information Technology. DOI:10.1108/JSIT-04-2025-0155.
2. Zulkarnain, Z., Muda, I., & Kesuma, S. A. (2025). "Factors Determining the Adoption of E-Procurement in Developing Countries: A Systematic Literature Review", International Journal of Social Service and Research (IJSSR), 3(2). DOI:10.46799/ijssr.v3i2.281.
3.ltan, B., Alhammad, I., AlOthman, A., & AlSehli, G. (2025). "Bridging the Literature Gap on eProcurement Systems: Insights from Saudi Arabia's Sustainable Development Transition", Sustainability, 17(8), 3429. DOI:10.3390/su17083429.
4. S. Bhadra, A. Goon, R. Naveenkumar, S. Roy, et al., "Fortifying the Resilience and Integrity of Cyber-Physical Systems through Meticulous Assessment," Nano NTP, Vol. 20, S16 (2024). DOI: 10.62441/nano-ntp.vi.4459.
5."Enhancing Supply Chain Resilience through Digital Procurement: An Information Processing Theory Perspective" (2025). International Journal of Research and Innovation in Social Science. DOI:10.47772/IJRISS.2025.907000162.
6.Dermaku, H., & Dermaku, M. (2025). "Government e-Procurement as a Type of Modern Information Technology", Rivista di Studi sulla Sostenibilità – Review of Studies on Sustainability, 10(1). DOI:10.3280/riss2025oa19823.
7.Ayobami, T., Mike-Olisa, U., Ogeawuchi, J. C., Abayomi, A. A., & Agboola, O. A. (2024). "Digital Procurement 4.0: Redesigning Government Contracting Systems with AI-Driven Ethics, Compliance, and Performance Optimization", International Journal of Scientific Research in Computer Science, Engineering and Information Technology, 10(2), 834–865. DOI:10.32628/CSEIT24102138.
8.Gurgun, A. P., Kunkcu, H., Koc, K., Arditi, D., & Atabay, S. (2024). "Challenges in the Integration of E-Procurement Procedures into Construction Supply Chains", Buildings, 14, 605. DOI:10.3390/buildings14030605.
9.Jama, E. M., Mwanza, B. G., & Mwanaumo, E. M. (2024). "E-Procurement Adoption Barriers Encountered by Small and Medium-Sized Enterprises (SMEs) in the Republic of South Sudan", African Journal of Commercial Studies, 4(1), 48–68. DOI:10.59413/ajocs/v4.i1.5.
10.Afolabi, A., Ibem, E., Aduwo, E., & Tunji-Olayeni, P. (2022). "Digitizing the Grey Areas in the Nigerian Public Procurement System Using E-Procurement Technologies", International Journal of Construction Management, 22(12), 2215–2224. DOI:10.1080/15623599.2020.1774836
11.Afolabi, A., Ibem, E., Aduwo, E., Tunji-Olayeni, P., & Oluwunmi, O. (2019). "Critical Success Factors (CSFs) for E-Procurement Adoption in the Nigerian Construction Industry", Buildings, 9(2), 47. DOI:10.3390/buildings9020047.
12. S. Bhattacharjee, R. Naveenkumar, R. Singha, S. Mullick, R. Sarkar, "Impact of Machine Learning on Enhancing Diversity and Inclusion through Recommendation Systems," Journal of Informatics Education and Research, Vol. 4, No. 2, pp. 3141–3159, 2024. DOI: 10.52783/jier.v4i2.1234.
13.Sila, I. (2013). "Factors Affecting the Adoption of B2B E-Commerce Technologies", Electronic Commerce Research, 13(2), 199–236. DOI:10.1007/s10660-013-9110-7.
14.Madhesh, M., & Parvathi, S. (2025). Economic Empowerment Through Coir Industry: A Study on Production and Market Dynamics in Tamil Nadu's Namakkal District. Journal of Economics and Business Issues, 5(1), 26-44.
15.Rawat, D., Mittal, R. K., & Aggarwal, V. S. (2017). Cluster development approach in India: An antidote for micro, small and medium enterprises. Indian Journal of Commerce and Management Studies, 8(2), 19-29.
16.Goldar, A., Sharma, S., Sawant, V., & Jain, S. (2019). Climate change & technology transfer: Barriers, technologies and mechanisms (No. 382). Working Paper.
17.Sheikh, C. A., & Saxena, P. (2020). Redemption of Indian MSME sector towards sustainability amid COVID-19 pandamic attack. Sambodhi, 43, 86-97.
18.Kiron, K. R., & Kannan, K. (2014). An investigation on the innovations in steel re-rolling MSMEs with reference to industries in Kerala State, India. Applied Mechanics and Materials, 592, 2711-2715.
19.Kalluraya, S., & Radhika, T. R. (2017). Machine tool cluster: Indian experience. Journal of Emerging Trends in Engineering and Applied Sciences, 8(5), 202-209.
20.Naik, S., & Bagodi, V. (2021). Energy conservation opportunities: evidences from three industrial clusters in India. International Journal of Energy Sector Management, 15(3), 600-627.
21.Das, K. E. S. H. A. B., Gulati, M. U. K. E. S. H., Sarkar, T. A. M. A. L., & Banerjee, S. U. K. A. N. Y. A. (2008). Clustering for Progress: The Road Travelled and the Way Ahead. Rural microfinance and microenterprise: informal revolution 1st Edition. New Delhi: Concept Publishing Company, 217-220.
22. B. Sharan, U. M. Mulani, R. Naveenkumar, S. K. Badodia, H. Makawana, J. A. Dhanraj, "Natural Language Processing for Generating Synthetic News Detection," IEEE IC3I, 2025. DOI: 10.1109/IC3I61595.2024.10828731
23. Kumar R.; Sarkar, Rubib;Chandel, Tanu, Tailored Chalcogenide Materials for Eco-Efficient Electronic and Energy Systems, Chalcogenide-Based Materials for Optoelectronics, Energy, and Sustainability ,2025, DOI: 10.4018/979-8-3373-3962-7.
24. Sharma, Meenakshi[a]; Kumar R.[a];Sarkar, Rubi[a];Majumder, M. Shrestha[b]; Kumar, K. Nitin[a] "Transforming Higher Education for Sustainability: The Role of Digital Leadership in Innovation, Equity, and Resource Management",2025, DOI: 10.4018/979-8-3693-9989-7.ch011Copy to clipboard
25. Ranga, Jarabala, Arul Prasath A.Kumar, Neeraj[c]kumar R , UrbanDrivePathway: A Decision-Making Framework for Navigating Urban Autonomous Vehicles in Complex Traffic Systems. ICOEI 2025,DOI: 10.1109/ICOEI65986.2025.11013137.