

BEYOND MANAGEMENT SUPPORT: A UTAUT-BASED ANALYSIS OF E-PROCUREMENT ADOPTION AND SME PERFORMANCE IN GHANA

Anyang Linda

Hohai University-China

CHINA

anyanglinda@hhu.edu.cn

ABSTRACT

The adoption of e-procurement technologies has become a critical pathway for enhancing the efficiency and competitiveness of small and medium enterprises (SMEs). This study examines the determinants of e-procurement adoption and their impact on SME performance in Ghana using the Unified Theory of Acceptance and Use of Technology (UTAUT). A cross-sectional survey design was employed, drawing on data from 123 respondents across 25 SMEs. Data were analyzed using covariance-based Structural Equation Modeling (CB-SEM). The findings reveal that effort expectancy ($\beta = .415, p < .001$), facilitating conditions ($\beta = .180, p < .05$), and performance expectancy ($\beta = .185, p < .05$) significantly and positively influence SME performance, with effort expectancy emerging as the strongest predictor. Correlation results further indicate strong associations among key constructs, particularly between performance expectancy and management support ($r = .935, p < .01$). However, contrary to prevailing assumptions, management support does not exert a significant direct effect on SME performance ($\beta = .227, p = .124$), suggesting a limited moderating role. The study concludes that while e-procurement adoption significantly enhances SME performance, its effectiveness is primarily driven by system usability, perceived benefits, and enabling infrastructure rather than managerial support alone. The study offers a novel contribution by demonstrating the indirect and context-dependent role of management support within the UTAUT framework. It recommends targeted investments in digital infrastructure, user training, and policy support to strengthen e-procurement adoption and optimize SME performance in emerging economies.

Keywords: E-procurement adoption; Small and Medium Enterprises (SMEs); Unified Theory of Acceptance and Use of Technology (UTAUT).

INTRODUCTION

Digital transformation in public sector procurement is increasingly recognized as a catalyst for enhancing transparency, efficiency, and cost-effectiveness in governmental operations. In response to persistent inefficiencies in traditional procurement methods, Ghana launched the Ghana Electronic Procurement System (GHANEPS) on April 30, 2019. GHANEPS represents a significant stride toward enhancing transparency, efficiency, and cost-effectiveness in public sector procurement. Following an initial pilot phase, the system's nationwide roll-out began in November 2019, accompanied by intensive stakeholder engagement and training efforts. As of the latest reports, 359 public entities have been engaged, 318 have undergone training, and 308 have been integrated into the live system. Additionally, 3,606 users have been registered across these entities, and 22,179 suppliers, contractors, and consultants are active on the platform (GHANEPS, 2024).

The adoption process has involved the training of nearly 6,200 individuals, including procurement officers, management staff, and suppliers, reflecting the government's commitment to institutional capacity building. Despite this progress, the extent of participation by small and medium-sized enterprises (SMEs) remains uncertain. SMEs continue to face systemic barriers such as inadequate digital infrastructure, limited technical knowledge, and financial constraints, all of which pose challenges to their integration into the digital procurement ecosystem. These concerns highlight the need for further investigation into SME adoption of e-procurement technologies and the development of targeted support mechanisms to ensure inclusive digital transformation (Burnson, 2021).

The conventional procurement system has been replaced by an electronic one with the introduction of internet technology and open innovations. The adopter, the technology, and the ecosystem in which they operate are some of the variables that affect technology adoption. E-procurement is currently mostly used by larger companies rather than small and medium-sized businesses (SMEs), despite these alluring advantages (Sánchez-Rodríguez et al., 2019; Singh & Chan, 2022). Scholars suggest that e-procurement could result in significant improvements in innovation, quality, speed, and risk management, as well as material cost savings of 5 to 10% and productivity gains of 30 to 50% (Högel et al., 2018). Incorporating digitalization into the procurement process, there are more opportunities than ever before to source from the thousands of suppliers that are active on the global market. However, the requirements for the actual process and supporting infrastructure are higher than ever before (Ivanov et al., 2018). Therefore, this study examines the factors that facilitate the adoption of digital technologies in the e-procurement among SMEs in Ghana. The author used management support as a moderation variable to investigate the relationship between e-procurement adoption factors and SMEs performance. This study is significant as it provides empirical evidence on the key drivers of e-procurement adoption and their impact on SME performance in Ghana, while offering new insights into the limited and context-dependent role of management support within the UTAUT framework. The remainder of the study is structured as follows: Section Two reviews the relevant literature and theoretical framework, Section Three outlines the research methodology, Section Four presents and discusses the empirical findings, and Section Five concludes with recommendations and implications for policy and practice.

LITERATURE REVIEW

The Concept of E-Procurement

The emerging technology disruptions have affected the procurement practices, process, and systems just like in other industries (Jufri and Budiman, 2022). The digitalization of procurement procedures using new digital technologies is the progression of procurement. Traditional procurement has been upgraded to electronic (e-procurement). And this is what Jufri and Budiman (2022) defined as the process of electronically acquiring the goods and services required for operational requirements. According to Pereira et al. (2020), e-procurement is the use of an online platform for the procurement process. According to Demartini (2019), businesses must be tech-savvy due to the current working environment. This is necessary due to the massive volume of information that needs to be recorded, examined, and evaluated to support procurement organizations' real-time business decisions. Burnson (2018) asserted that top businesses are making the transition to a fully digital procurement organization. Procurement organizations are being revolutionized by digital technology, which also makes it easier for them

to obtain information and enhance service delivery (Motaung & Sifolo, 2023). Based on the evolving definitions and dimensions discussed, this study defines e-procurement as a digitally driven, end-to-end procurement process that leverages integrated technologies including cloud systems, artificial intelligence, electronic marketplaces, and web-based ERP platforms to automate, streamline, and enhance purchasing activities across organizational supply chains. This definition acknowledges not only the transactional aspects (e.g., electronic ordering and bidding) but also the strategic integration of data, people, and intelligent systems that drive informed decision-making, efficiency, transparency, and adaptability in procurement practices.

Application of E-Procurement Among Small and Medium-Sized Enterprises

Despite the growing body of literature on e-procurement, existing studies have predominantly focused on large organizations and the public sector, with limited empirical attention given to private small and medium-sized enterprises (SMEs), particularly within the Ghanaian context. This creates a critical knowledge gap, as SMEs operate under distinct resource constraints, technological readiness levels, and institutional conditions that may significantly influence their adoption and utilization of digital procurement systems. While studies such as Sánchez-Rodríguez et al. (2020) demonstrate a strong positive relationship between e-procurement adoption and organizational performance among manufacturing SMEs, their findings are largely based on non-African contexts, thereby limiting their generalizability to emerging economies like Ghana. Similarly, Masudin et al. (2021) highlight the importance of information quality, implementation processes, and top management support in enhancing firm performance through e-procurement in Indonesia, while Waithaka and Kimani (2021) establish that effective e-procurement practices improve supply chain performance and organizational competitiveness. However, these studies do not sufficiently account for contextual variations such as infrastructural limitations, regulatory environments, and digital maturity levels that characterize SMEs in developing economies. Consequently, there remains a need for context-specific empirical investigation to understand how e-procurement adoption influences SME performance in Ghana and whether established determinants, such as management support, play a similar role. This study therefore addresses this gap by providing localized evidence and extending existing literature through a nuanced examination of e-procurement adoption within the SME sector in Ghana.

Hassan et al. (2017) examined the determinants influencing e-procurement in New Zealand's manufacturing SMEs. A favorable correlation was identified between e-procurement use and perceived advantages, external influences, and technological compatibility. Nonetheless, their findings did not substantiate a substantial correlation between e-procurement and executive management support. Altayyar and Beaumont-Kerridge (2016) investigated external factors affecting e-procurement adoption in Saudi SMEs via interviews. The criteria encompassed governmental backing, internet infrastructure, online payment security, supplier preparedness, legal framework, and national business culture. Ivanov et al. (2018) performed a systematic literature analysis to evaluate the influence of Industry 4.0 technologies on supply chain risk management in small enterprises. Digital transformation can improve management of supply chain interruptions. Sánchez-Rodríguez et al. (2019) conducted a comprehensive analysis of the advantages, obstacles, and motivators of e-procurement in small and medium-sized enterprises, utilizing a sample of 199 manufacturing managers. Their findings validated that e-procurement substantially enhances company and procurement performance.

Singh and Chan (2022) observed that external pressures from suppliers and rivals, along with the perceived advantages of e-procurement, affect its adoption. The extent of integration is contingent upon the alignment of e-procurement with the organization's values, operations, technology, and strategic objectives. Motaung and Sifolo (2023) examined the advantages and obstacles of digital procurement through the case study of an airport corporation. The study, through interviews with professionals skilled in procurement and digital transformation, determined that digital procurement enhances value and decreases supply chain costs. Gunasekaran et al. (2009) performed a comprehensive examination of e-procurement in small and medium-sized firms across the manufacturing, commercial, and service sectors in the southwestern United States. The primary obstacles identified are insufficient prioritizing, restricted knowledge, and IT/security issues. Key success elements encompass robust supplier relationships, centralized procurement oversight, streamlined workflows, defined accountability, and proactive engagement from top management.

Unified Theory of Acceptance and Use of Technology (UTAUT) Model

The Unified Theory of Acceptance and Use of Technology (UTAUT), formulated by Venkatesh et al., is a comprehensive framework for elucidating user acceptance and adoption of information technologies. The model originated from a comprehensive assessment and synthesis of eight significant theories of technology adoption, namely the Technology Acceptance Model, Theory of Reasoned Action, Theory of Planned Behavior, Motivational Model, Model of PC Utilization, Hybrid TAM-TPB Model, Social Cognitive Theory, and Diffusion of Innovations Theory. Through the synthesis of different theoretical viewpoints, UTAUT offers a cohesive and comprehensive account of technology adoption behavior across various circumstances.

Previous models, notably the Technology Acceptance Model, have been extensively utilized to forecast user behavior regarding information technology. Empirical research indicates that the Technology Acceptance Model (TAM) accounts for only about 30% to 40% of the variance in technology adoption, highlighting its restricted predictive capability (Chuttur, 2009; Teo, 2011). Considering these limitations, UTAUT was introduced to improve explanatory power by integrating a wider array of determinants and contextual factors affecting technology utilization. The UTAUT paradigm delineates four fundamental constructs performance expectancy, effort expectancy, social influence, and facilitating conditions as primary predictors of behavioral intention and actual system utilization. Performance expectancy denotes the extent to which an individual perceives that utilizing a specific method would improve job performance. This indicates users' impressions of enhanced efficiency, cost savings, and operational efficacy in e-procurement. Effort expectancy refers to the perceived ease of system utilization, including factors such as usability, simplicity, and complexity. Social influence refers to the degree to which individuals believe that significant others such as peers, superiors, or organizational leaders promote or anticipate the utilization of a specific technology. Facilitating conditions denote the presence of organizational and technical infrastructure essential for system utilization. Significantly, UTAUT includes moderating variables such as age, gender, experience, and voluntariness of usage, which affect the intensity of the correlations between the fundamental components and behavioral intentions. This multifaceted framework improves the model's relevance in organizational and technical settings, especially in emerging nations where contextual elements may profoundly influence adoption behavior. Recently, the utilization of UTAUT in e-procurement and digital transformation research has garnered significant academic

interest. Digital technologies have progressively revolutionized procurement procedures by enhancing information accessibility, transparency, and the efficiency of service delivery (Motaung & Sifolo, 2023). Empirical research demonstrates that performance expectancy and social influence are key predictors of e-procurement adoption, as individuals are more inclined to embrace these systems when they perceive them as beneficial and receive support from their professional networks (Addy et al., 2022). Research by Jufri and Budiman (2022) indicates that facilitating conditions and user interest substantially affect the desire to utilize e-procurement applications. Their findings indicate that performance expectancy, effort expectancy, and social factors significantly influence consumers' readiness to adopt digital procurement systems. Marikyan and Papagiannidis (2023) assert that UTAUT constructs are fundamental in elucidating technology adoption within dynamic digital ecosystems.

Moreover, recent studies emphasize the moderating influence of organizational support, especially managerial commitment, in improving the efficacy of e-procurement adoption among SMEs. Managerial assistance enhances the influence of performance expectancy and favorable conditions while alleviating potential obstacles to technology utilization, therefore enhancing overall corporate performance. Thus, the amalgamation of UTAUT structures with organizational elements offers a more refined comprehension of digital technology adoption in SMEs. The UTAUT model provides a solid theoretical framework for analyzing the adoption of digital technologies in e-procurement. The comprehensive framework and robust empirical evidence render it especially pertinent for examining how SMEs in emerging economies, like Ghana, adopt and employ digital procurement methods to improve operational efficiency and competitiveness.

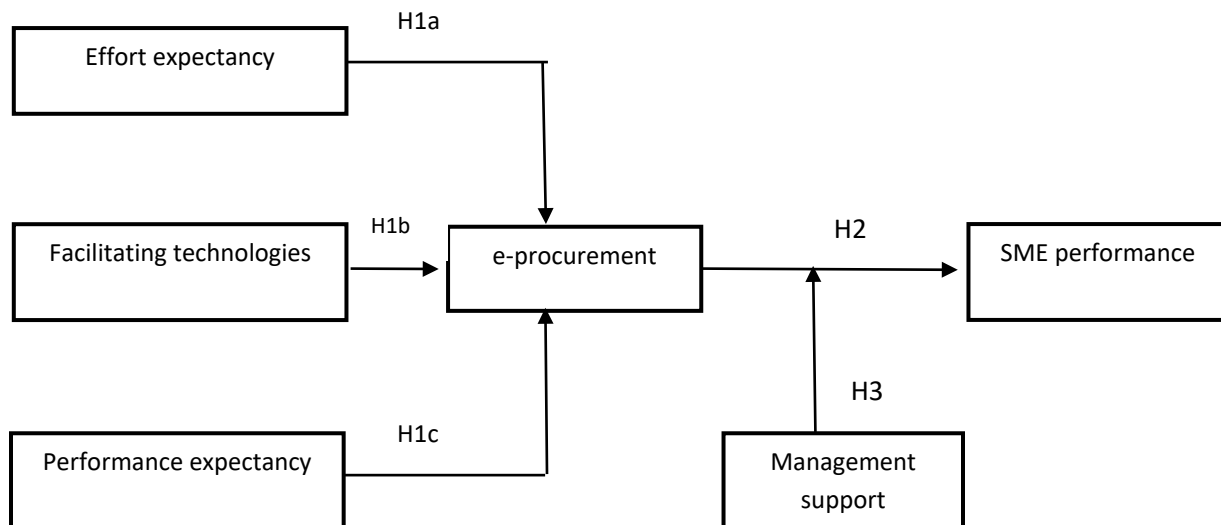


Figure 1 Research model

Hypothesis development

H1a: Effort expectancy positively influences SMEs performance in e-procurement usage

Effort expectancy, a core construct of the UTAUT model, reflects the perceived ease of using a system. In the context of SMEs, the simpler and more user-friendly e-procurement systems are, the more likely they are to be adopted and effectively utilized, enhancing performance outcomes.

Motaung and Sifolo (2023) emphasize that digital technologies such as e-procurement streamline procurement processes, saving time and effort. When SMEs perceive these systems as less complex, they are more inclined to integrate them into their operations. Jufri and Budiman (2022) also found that effort expectancy significantly impacts behavioral intentions, suggesting that if employees find the system easy to use, they are more productive, resulting in improved organizational performance. Thus, effort expectancy enhances SMEs' operational efficiency by minimizing learning curves and maximizing usage efficiency.

H1b: Facilitating conditions positively affect SMEs performance in e-procurement usage

Facilitating conditions, another critical UTAUT variable, refers to the availability of organizational and technical infrastructure to support system use. For SMEs, access to adequate ICT resources, internet connectivity, and skilled technical support can significantly affect the successful use of e-procurement systems. Jufri and Budiman (2022) showed that facilitating conditions are a strong predictor of technology adoption behavior. Marikyan and Papagiannidis (2023) further argued that robust facilitating conditions enhance system use, which can lead to better procurement practices and improved business performance. When SMEs are equipped with the right infrastructure and resources, they are better positioned to use e-procurement systems effectively, leading to increased operational efficiency and performance gains.

H1c: There is a positive association between performance expectancy and SMEs performance in e-procurement

Performance expectancy, defined as the perceived benefits of using technology, plays a crucial role in influencing e-procurement adoption and subsequent business performance. According to the UTAUT framework, users are more likely to adopt a system when they believe it will improve job performance. Addy et al. (2022) found performance expectations to be one of the most influential factors in e-procurement adoption among SMEs. When SMEs expect that e-procurement will enhance speed, reduce procurement costs, and increase accuracy, they are more likely to adopt and utilize it effectively. Marikyan and Papagiannidis (2023) emphasized that such perceptions directly translate to improved operational outcomes, thus boosting overall business performance.

H2: E-procurement positively affects SMEs business performance

E-procurement enhances business processes by reducing costs, increasing transparency, and improving procurement efficiency. For SMEs, which often operate with limited resources, these benefits are vital. Motaung and Sifolo (2023) noted that digital technologies are transforming procurement operations by increasing service delivery and facilitating faster information access. Through automation and digital documentation, e-procurement minimizes errors and shortens procurement cycles, directly contributing to improved performance. Jufri and Budiman (2022) affirmed that e-procurement usage leads to tangible business outcomes, such as cost savings and better supplier relationships. The adoption of e-procurement systems thus enables SMEs to streamline their procurement processes, which in turn enhances their overall performance and competitiveness.

H3: Management support moderates the relationship between SMEs performance and all e-procurement variables

Management support is critical for the successful implementation of e-procurement systems in SMEs. It acts as a moderating factor by influencing the extent to which effort expectancy, facilitating conditions, and performance expectancy translate into actual business performance. When top management endorses and supports e-procurement initiatives through training, resource allocation, and strategic vision employees are more motivated to adopt and effectively use the systems. Marikyan and Papagiannidis (2023) argued that without adequate managerial support, even the best e-procurement systems may underperform. The presence of strong leadership enhances the effects of UTAUT variables on performance by ensuring that policies and practices align with digital transformation goals. Thus, management support amplifies the positive impact of e-procurement usage on SME performance.

METHODOLOGY

Research Design

This study adopts a cross-sectional survey design to examine the determinants of digital technology adoption in e-procurement among small and medium-sized enterprises (SMEs) in Ghana. The cross-sectional approach enables the collection of data from many respondents at a single point in time, making it suitable for analyzing relationships among multiple variables within the framework of the Unified Theory of Acceptance and Use of Technology (UTAUT). Consistent with quantitative research traditions, this design facilitates the empirical testing of hypothesized relationships between independent variables (i.e., UTAUT constructs) and the dependent variable (i.e., adoption of digital technologies in e-procurement). The design is particularly advantageous due to its cost-effectiveness, time efficiency, and ability to capture a snapshot of prevailing conditions without temporal distortions. Furthermore, the study employs a correlational approach to assess the strength and direction of associations among variables, thereby contributing to theory validation and extension.

Population

The target population comprises SMEs operating in Ghana that are actively engaged in procurement-related activities. These enterprises span multiple sectors, including manufacturing, retail, agriculture, and services, ensuring a comprehensive representation of the SME landscape. The unit of analysis includes owners, procurement managers, and employees directly involved in procurement processes, as they possess the requisite knowledge and experience relevant to the study. A combination of stratified random sampling technique is employed. Stratification ensures proportional representation across key sectors, while convenience sampling facilitates access to respondents with practical experience in e-procurement systems. The study focuses on 25 small-scale manufacturing firms, with an anticipated sample size of approximately 120–123 respondents. This sample size is considered adequate for statistical analysis and is consistent with prior studies utilizing the UTAUT model in technology adoption research.

Questionnaire Design and Data Collection

Data for this study are collected using a structured questionnaire developed in English. The instrument is designed based on validated constructions from the UTAUT model, including performance expectancy, effort expectancy, social influence, and facilitating conditions. Responses are measured using a five-point Likert scale ranging from “strongly disagree” (1) to

“strongly agree” (5), which provides a balanced response format while minimizing respondent fatigue and enhancing statistical interpretability. The questionnaire is organized into three sections: Section A is about demographic characteristics (e.g., age, gender, organizational role, and sector). Section B presents the UTAUT constructs assessing determinants of digital technology adoption. And Section C presents questions about digital technology usage, including experience and frequency of e-procurement system use

A pilot study involving 25 SME representatives is conducted to evaluate the clarity, reliability, and validity of the instrument. Feedback from the pilot test informs revisions to improve item wording and structure. The selected pilot sample size aligns with established methodological recommendations for pretesting survey instruments and enables the assessment of internal consistency using reliability coefficients such as Cronbach’s alpha. Data collection is carried out using a mixed-mode approach, combining online (Google Forms) and face-to-face distribution methods. This approach enhances response rates and accommodates respondents with limited internet access. The use of a research assistant within Ghana further facilitates effective data administration and follow-up.

Data Analysis Method

Data analysis is conducted using Statistical Package for the Social Sciences (SPSS) and Analysis of Moment Structures (AMOS). Descriptive statistics, including means and standard deviations, are used to summarize the data, while inferential techniques are employed to test the study hypotheses. Reliability of the measurement scales is assessed using Cronbach’s alpha, and construct validity is evaluated through factor analysis. Structural Equation Modeling (SEM) is applied to examine the relationships among variables and to assess model fit using indices such as the Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Normed Fit Index (NFI), and Chi-square statistics. Additionally, structural analysis is utilized to determine the predictive influence of UTAUT constructs on the adoption of digital technologies in e-procurement. Results are presented using tables, figures, and path diagrams to enhance clarity and facilitate interpretation.

The study adheres strictly to established ethical standards in academic research. Participants are fully informed about the purpose of the study, their rights, and the voluntary nature of their participation. Informed consent is obtained prior to data collection. Confidentiality and anonymity are ensured by removing all personally identifiable information from the dataset. Data are securely stored and accessed only by the research team. Participants are also informed of their right to withdraw from the study at any stage without any consequences.

RESULTS

Respondents’ Background Information

This section presents the respondents background information on the adoption of digital technologies in e-procurement among SMEs in Ghana. In all, one hundred and twenty-three (123) responses from five (5) different business sectors were used for the analysis.

Table 1. Respondents' background data

Variables	Items	Frequency	Percent (%)
Gender	Male	55	44.7
	Female	68	55.3
Age (in years)	Under 25 years	16	13.0
	25-35 years	73	59.3
	36-45 years	23	18.7
	46 and above years	11	8.9
Level of education	Secondary level	16	13.0
	Tertiary/College education	107	87.0
Primary business sector	Manufacturing	5	4.1
	Retail/Wholesale	34	27.6
	Service (education, finance, law, etc)	44	35.8
	Technology & communication	20	16.3
	others (unclassified)	20	16.3
Number of years working	Less than 1 year	12	9.8
	1-5 years	72	58.5
	6-10 years	14	11.4
	More than 10 years	25	20.3
Business size by employees	1-9 employees (Micro)	40	32.5
	10-49 employees (Small)	37	30.1
	50-99 employees (Medium)	4	3.3
	More than 100 employees	42	34.1

Table 1 analyzed 123 valid responses from SMEs in Ghana, revealing a demographic of 68 females (55.3%) and 55 males (44.7%). Most respondents were aged 25–35 years (59.3%) with tertiary education (87.0%). Sector distribution showed a majority from the service sector (35.8%), followed by retail/wholesale (27.6%) and technology/communication (16.3%). Work experience varied, with 58.5% having 1-5 years. Firm sizes included 34.1% with over 100 employees, 32.5% as micro enterprises, and only 3.3% classified as medium-sized. The sample indicates a young, educated, and moderately experienced SME workforce, primarily from the service and retail sectors.

Descriptive and Reliability Statistics

Table 2 demonstrates a high level of internal consistency for the measurement scale, with a Cronbach's alpha surpassing the .70 threshold. Individual constructs related to e-procurement adoption in Table 2 show moderate to high internal consistency. Effort expectancy scored a mean of 3.54, indicating ease of use, with user confidence highest at 3.55. Facilitating conditions had a mean of 3.50, suggesting adequate technological support but some variability in resources. Performance expectancy had the highest mean of 3.74, reflecting strong belief in e-procurement's efficiency benefits. Management support also rated favorably at 3.51, while SME business performance averaged 3.42, indicating moderate perceived improvements. Overall, the results confirm strong reliability suitable for further analysis.

Table 2: Reliability statistics of all items

SN	Variables	M	SD	α
	Effort expectancy	3.54		
EE1	Using the e-procurement system is easy for my business.	3.57	1.00	0.949
EE2	I find the e-procurement system clear and understandable.	3.52	0.95	
EE3	Learning how to use the e-procurement system was easy for my business.	3.53	0.93	
EE4	The e-procurement system requires minimal effort to operate.	3.52	0.89	
EE5	I feel confident in my ability to use the e-procurement system.	3.55	1.17	
	Facilitating conditions	3.50		
FC1	My firm has adequate technological resources to use the e-procurement system.	3.33	1.18	0.939
FC2	Training is available to help employees learn how to use the e-procurement system.	3.56	0.99	
FC3	Technical support is easily accessible for solving problems with the e-procurement system.	3.53	0.95	
FC4	The e-procurement system is compatible with other systems in my business.	3.50	1.02	
FC5	Internet connectivity is reliable enough to support e-procurement activities.	3.60	0.92	
	Performance expectancy	3.74		
PE1	The e-procurement system improves the efficiency of procurement processes in my business.	3.76	1.11	0.973
PE2	Using the e-procurement system enhances the productivity of employees.	3.72	1.06	
PE3	The e-procurement system helps my business achieve better results.	3.76	1.05	
PE4	The e-procurement system reduces procurement costs.	3.75	0.96	
PE5	My business experiences better supplier relationships due to the e-procurement system	3.69	1.10	
	Management support	3.51		
MS1	Management encourages employees to use the e-procurement system.	3.57	1.06	0.953
MS2	Management provides adequate resources for the implementation of the e-procurement system.	3.51	0.85	
MS3	Managers actively participate in the e-procurement adoption process.	3.50	1.18	
MS4	Management provides training opportunities for employees on e-procurement usage	3.47	1.20	
	SME Business Performance	3.42		
BP1	The e-procurement system has improved the profitability of my business.	3.21	1.14	0.969
BP2	The use of e-procurement has led to cost savings in business operations.	3.50	1.02	
BP3	The e-procurement system has increased the overall productivity of the business.	3.41	0.99	
BP4	My business has experienced enhanced competitiveness due to e-procurement.	3.50	0.85	
BP5	Customer satisfaction has improved as a result of using the e-procurement system	3.47	0.85	

Note: Overall reliability(α) = .986

Exploratory Factor Analysis (EFA)

The findings from the exploratory factor analysis (EFA) presented in Table 3 validate the reliability and validity of the components evaluating SMEs' e-procurement usage. All Kaiser-Meyer-Olkin (KMO) scores surpassed the 0.7 criterion, signifying adequate sampling. The most substantial factor loadings were seen in effort expectancy (KMO = 0.728, variance explained = 66.65%), with notable indicators such as EE5 (0.835) and EE1 (0.832), underscoring the significance of system reliability and user-friendliness. The facilitating conditions demonstrated strong loadings (KMO = 0.721, variance explained = 67.65%), notably FC4 (0.985) and FC2 (0.839), highlighting the significance of training availability and system compatibility. Performance expectancy demonstrated the highest KMO (0.800) and accounted for 75.12% of variance, influenced by robust loadings PE5 (0.936) and PE1 (0.871). Management support demonstrated strong internal consistency (KMO = 0.772, variance explained = 78.36%), with MS1 (0.981) and MS3 (0.947). Lastly, business performance factors BP3 (0.976) and BP4

(0.917) scored highest in variance explained (84.64%) and KMO (0.827), indicating their significant role in enhancing SME productivity and competitiveness.

Table 3 Exploratory factor analysis among variables

Variable	Items	Factor Loadings 1	Extraction	% of Variance	KMO
Effort expectancy	EE1	.832	.802	66.65%	KMO = .728***
	EE2	.819	.745		
	EE3	.708	.770		
	EE4	.684	.654		
	EE5	.835	.651		
Facilitating conditions	FC1	.702	.521	67.65%	KMO = .721***
	FC2	.839	.788		
	FC3	.766	.656		
	FC4	.985	.870		
	FC5	.752	.766		
Performance expectancy	PE1	.871	.426	75.12%	KMO = .800***
	PE2	.689	.775		
	PE3	.619	.517		
	PE4	.719	.618		
	PE5	.936	.876		
Management support	MS1	.981	.876	78.36%	KMO = .772***
	MS2	.726	.766		
	MS3	.947	.897		
	MS4	.865	.748		
SME Business Performance	BP1	.899	.839	84.64%	KMO = .827***
	BP2	.935	.874		
	BP3	.976	.935		
	BP4	.917	.939		
	BP5	.702	.521		

Correctional Matrix

The study used correlation analysis to examine relationships among variables, demonstrating robust associations between e-procurement adoption and SME company performance.

Table 4: Correlation matrix among study variables

Variables	1	2	3	4	5
Effort expectancy	1				
Facilitating conditions	.778**	1			
Performance expectancy	.907**	.728**	1		
Management support	.868**	.845**	.935**	1	
SME Business Performance	.900**	.808**	.885**	.890**	1

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

Table 4 showed a strong positive link between effort expectancy and company performance ($r = 0.900$, $p < 0.01$), suggesting that ease of use influences results. Performance expectancy exhibits a strong correlation with management support ($r = 0.935$, $p < 0.01$) and company performance ($r = 0.885$, $p < 0.01$), highlighting the significance of managerial engagement. Furthermore, favorable conditions exhibit a robust correlation with business performance ($r = 0.808$, $p < 0.01$) and management support ($r = 0.845$, $p < 0.01$), underscoring the essentiality of resources for effective e-procurement deployment. Management support, performance expectancy, facilitating conditions, and effort expectancy are significantly connected with SME performance, underscoring their significance for successful e-procurement implementation.

Path Model Fitness

The structural model in Figure 2 illustrates the relationships among effort expectancy (Effort_exp), facilitating conditions (Fac_Condi), performance expectancy (Perf_exp), management support (Mgt_sup), and SME business performance (SME_per) in the context of e-procurement usage. The model exhibits excellent construct validity and internal reliability, and the constructs are sufficiently measured. A strong model fit is demonstrated by all key fit indices meeting or surpassing the thresholds set in the literature. The model effectively depicts the data structure, as evidenced by the Goodness-of-Fit Index (GFI) of 0.912 and the Adjusted Goodness-of-Fit Index (AGFI) of 0.903, both of which are higher than the suggested value of 0.90.

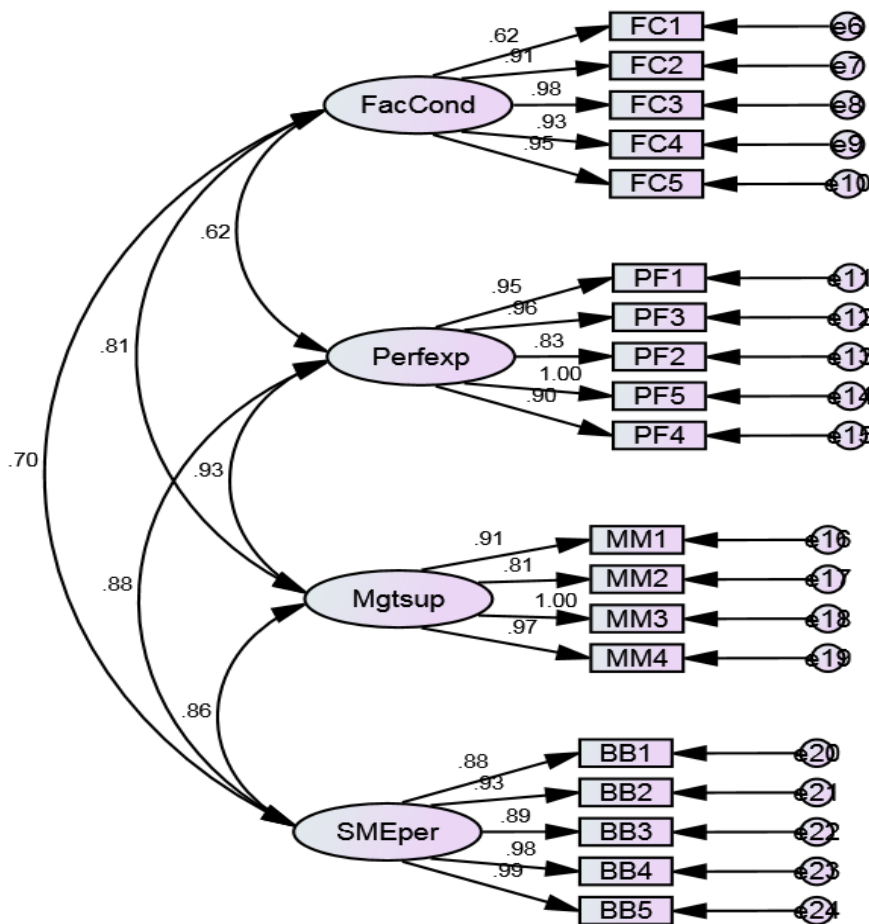


Figure 2 Measurement model diagram

Structural Model

The study uses SPSS and AMOS integration to specify the structural model as illustrated in Figure 2. The image illustrates the relationship among effort expectancy (Effort_exp), facilitating conditions (Fac_Condi), performance expectancy (Perf_exp), management support (Mgt_sup), and SME business performance (SME_per) in the context of e-procurement usage. The structural model and regression results provide insights into the relationships among effort expectancy (Effort_exp), facilitating conditions (Fac_Condi), performance expectancy (Perf_exp),

management support (Mgt_sup), and SME business performance (SME_per) in the context of e-procurement usage. Deducing from Table 5 and Figure 3, thus the regression table and structural model respectively, the study examines the hypothesis set forth the research model.

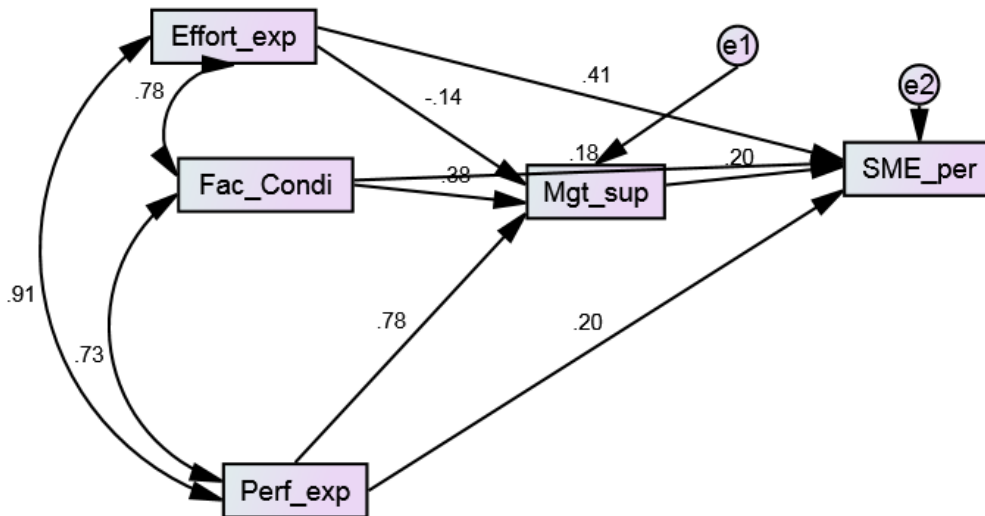


Figure 3: Structural model of path diagram

Table 5: Regression Weights: (Group number 1 - Default model)

Path relationship among variables	Estimate	S.E.	C.R.	P, <0.05	Label
Mgt_sup <--- Fac_Condi	.341	.033	10.333	***	Support
Mgt_sup <--- Perf_exp	.630	.045	14.061	***	Support
Mgt_sup <--- Effort_exp	-.126	.054	-2.321	***	Support
SME_per <--- Perf_exp	.185	.118	1.565	***	Support
SME_per <--- Mgt_sup	.227	.147	1.539	.124	Not Support
SME_per <--- Effort_exp	.415	.090	4.590	***	Support
SME_per <--- Fac_Condi	.180	.074	2.444	***	Support

Note: AMOS result; P, <0.05

H1a: Effort expectancy will positively influence SMEs' performance in e-procurement usage
 The study investigates the assumption that business effort expectancy will react positively with SMEs performance in e-procurement usage. The finding supports this proposition. The regression coefficient for Effort_exp → SME_per is 0.415 (p < 0.001), indicating a strong positive influence. This supports H1a, showing that when SMEs perceive e-procurement systems as easy to use, their performance improves significantly in accordance with the UTAUT theory.

This also means that required effort such confidence, easy of use, understanding and reliability, etc. play influential part in promoting e-procurement usage among SMEs in Ghana.

H1b: Facilitating conditions will positively affect SMEs' performance in e-procurement usage

Also, the study establishes that the relationship between Fac_Condi → SME_per is 0.180 ($p \leq 0.05$), which is statistically significant. This supports H1b, suggesting that SMEs with better infrastructure, resources, and support structures experience improved performance through e-procurement. The study confirms that providing SMEs with sufficient technical support, training, and infrastructural resources for e-procurement adoption is essential for better business performance. This highlights the importance of government policies, financial support, and technological infrastructure in enhancing SME success in digital procurement systems.

H1c: Performance expectancy will positively influence SMEs' performance in e-procurement.

The path from Perf_exp → SME_per is 0.0185 ($p < 0.05$), which is statistically significant under 95% confidence level. This does support H1c, suggesting that SMEs' expectations about the benefits of e-procurement may directly translate into improved performance. Other factors, such as implementation challenges or adoption barriers, may weaken this relationship. The performance expectancy factors deal with achieving better results, efficiency, improving supplier relationship, reducing procurement cost and others to achieve maximum results or performance in the SMEs.

H2: E-procurement will positively affect SMEs' business performance

Overall, all the e-procurement independent variables contributed collectively and individual to positively. Since SME_per is being directly influenced by effort expectancy (0.415, $p < 0.001$), facilitating conditions (0.180, $p = 0.015$), and performance expectancy (0.185, $p < 0.05$), the findings partially support H2. While some e-procurement-related factors positively impact SME performance, relatively their strength is not the same.

Indirect Effect (Moderation Effect)

Table 6: Indirect Effects (Group number 1 - Default model)

	Effort_exp	Fac_Condi	Perf_exp	Mgt_sup
Mgt_sup	.000	.000	.000	.000
SME_per	-.029	.077	.143	.000

This examines the hypothesis “H3: Management support will moderate the relationship between SMEs' performance and all e-procurement variables.” Table 6 depicts the relationship between Fac_Condi → Mgt_sup is 0.341 ($p < 0.001$) and Perf_exp → Mgt_sup is 0.630 ($p < 0.001$), indicating that both factors strongly influence management support. However, the influence of Mgt_sup → SME_per (0.227, $p = 0.124$) is not statistically significant, meaning that management support does not strongly moderate the relationship between e-procurement factors and SME performance. Thus, H3 is not fully supported.

DISCUSSION OF RESULTS

The study examined the relationships among key factors influencing e-procurement adoption in SMEs and their impact on business performance. Using correlation analysis and structural modeling, the results provided valuable insights into the role of effort expectancy, facilitating

conditions, performance expectancy, and management support in driving SME success in digital procurement systems. The correlation analysis revealed strong and statistically significant relationships among the study variables, suggesting a high level of interdependence in the adoption and effects of e-procurement among SMEs. The strong positive correlation between effort expectancy and SME performance ($r = 0.900$, $p < 0.01$) confirms that SMEs that perceive e-procurement systems as easy to use tend to experience improved business performance. This aligns with the Unified Theory of Acceptance and Use of Technology (UTAUT), which highlights that ease of use increases adoption rates (Venkatesh et al., 2003). Additionally, the highest correlation observed between performance expectancy and management support ($r = 0.935$, $p < 0.01$) suggests that management involvement significantly influences expectations regarding the benefits of e-procurement. This finding supports prior research by Davis (1989), which suggests that when management emphasizes the advantages of technology, employees are more likely to adopt and use digital systems effectively. Furthermore, the correlation between facilitating conditions and SME performance ($r = 0.808$, $p < 0.01$) indicates that SMEs with better technical infrastructure and support structures experience higher performance gains. This finding is in line with previous studies that highlight the role of technological and financial resources in successful digital transformation (Oliveira & Martins, 2011). Overall, these correlations suggest that multiple interrelated factors contribute to e-procurement success, reinforcing the importance of a holistic approach to adoption.

The structural model assessed the direct and indirect effects of e-procurement adoption factors on SME performance. The hypothesis that effort expectancy positively influences SME performance was supported, with a significant regression coefficient ($\beta = 0.415$, $p < 0.001$). This suggests that SMEs are more likely to benefit from e-procurement when they perceive the system as easy to use, which aligns with studies by Davis (1989) and Venkatesh et al. (2012) on technology adoption. Similarly, facilitating conditions were found to positively affect SME performance, as indicated by a significant regression coefficient ($\beta = 0.180$, $p = 0.015$). This supports research by Tornatzky and Fleischer (1990), who found that external support and technological readiness are critical enablers of IT adoption in businesses. Additionally, the study found a positive and significant relationship between performance expectancy and SME performance ($\beta = 0.185$, $p < 0.05$), suggesting that SMEs' expectations of improved efficiency, cost savings, and supplier relationships through e-procurement contribute to enhanced business performance. This aligns with past studies showing that organizations adopt new technologies primarily based on perceived benefits (Oliveira & Martins, 2011). Overall, the results indicate that e-procurement-related factors collectively contribute to SME performance, though the strength of influence varies. Effort expectancy had the strongest direct impact ($\beta = 0.415$, $p < 0.001$), followed by performance expectancy ($\beta = 0.185$, $p < 0.05$) and facilitating conditions ($\beta = 0.180$, $p = 0.015$). These findings align with research by Wang and Archer (2007), which emphasizes the role of perceived usefulness and ease of use in digital procurement adoption.

The study also examined the moderation effect of management support in the relationship between e-procurement factors and SME performance. It was hypothesized that management support would enhance the relationship between e-procurement adoption factors and SME performance. However, the regression analysis showed that management support did not significantly influence SME performance directly ($\beta = 0.227$, $p = 0.124$). Specifically, the study found a negative indirect effect of effort expectancy (-0.029), suggesting that higher effort

expectancy does not improve SME performance through management support. This contrasts with UTAUT-based studies that emphasize management's role in technology adoption (Venkatesh et al., 2012). On the other hand, facilitating conditions showed a positive indirect effect (0.077), suggesting that providing SMEs with infrastructure and technical support indirectly enhances business performance by increasing management support. The strongest indirect effect was observed for performance expectancy (0.143), indicating that when SMEs anticipate benefits from e-procurement, management support increases, indirectly contributing to performance. These findings suggest that while management support plays a role in facilitating e-procurement adoption, its direct influence on SME performance is limited. This aligns with studies that suggest management support is more effective when combined with adequate training, infrastructure, and financial backing (Chatterjee et al., 2021).

CONCLUSION

This study offers evidence regarding the factors influencing e-procurement adoption and its impact on SME performance in Ghana. Utilizing UTAUT, the results affirm that effort expectancy, enabling conditions, and performance expectancy are substantial predictors of small and medium-sized enterprise (SME) business performance. Effort anticipation was identified as the most significant factor, underscoring that perceptions of usability, system transparency, and user confidence are essential determinants of performance results in digital procurement settings. This highlights the importance of user-centered system design and capacity building in improving SME competitiveness. This study's significant addition is its structural modeling technique, which clarifies both direct and indirect links among the constructs. This study provides insight by finding that management support does not have a statistically significant direct effect on SME performance, despite past studies emphasizing its significance as a vital success determinant. Its influence is predominantly indirect, functioning through performance expectancy and enabling factors. This discovery contests prevailing assumptions within the UTAUT framework and enhances the literature by indicating that managerial engagement is inadequate unless accompanied by substantial infrastructure support and clearly recognized system advantages. The study enhances the discussion on digital transformation in SMEs by presenting a context-specific model that elucidates the interaction among technology preparedness, user perceptions, and organizational dynamics within a developing economy context. The findings indicate that favorable conditions and performance expectancy greatly influence both management support and performance results, emphasizing the necessity of ecosystem-level interventions such as policy support, digital infrastructure, and training programs.

This study possesses certain limitations that must be acknowledged when evaluating the results. The limited sample size of SMEs in Ghana constrains the generalizability of the findings. The cross-sectional approach limits the capacity to see dynamic changes in e-procurement usage and its enduring impact on company performance. Third, the study did not consider industry-specific variations that may affect adoption trends and results. Future study ought to utilize larger, more heterogeneous samples and longitudinal methodologies, while integrating sectoral analysis and future technologies to yield a more thorough and contextually relevant comprehension of e-procurement uptake.

REFERENCE

1. Addy, M. N., Addo, E. T., Kwofie, T. E., & Yartey, J. E. (2022). Predicting the adoption of e-procurement in construction project delivery in Sub-Saharan Africa: An application of UTAUT2. *Construction Innovation*. Advance online publication.
2. Agyei, R., & Boateng, K. (2023). Training deficiencies and e-procurement implementation in SMEs. *International Journal of Procurement and Supply Chain Management*, 9(1), 88–105.
3. Alhassan, T., & Frimpong, S. (2023). Operational costs as a barrier to digital adoption among small businesses. *Journal of Small Business Studies*, 10(3), 112–126.
4. Altayyar, A., & Beaumont-Kerridge, J. (2016). External factors affecting the adoption of e-procurement in Saudi Arabian SMEs. *Procedia – Social and Behavioral Sciences*, 229, 363–375.
5. Burnson, P. (2018). Procurement is getting its digitized act together. *Supply Chain Management Review*, 22, 10–11.
6. Chatterjee, S., Chaudhuri, R., & Vrontis, D. (2021). Adoption of e-procurement and its impact on SMEs: The role of organizational readiness, technology infrastructure, and regulatory support. *Journal of Business Research*, 127, 77–89.
7. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340.
8. De la Boulaye, P., Riedstra, P., & Spiller, P. (2017). Driving superior value through digital procurement. *McKinsey & Company*.
9. Demartini, M., Evans, S., & Tonelli, F. (2019). Digitalization technologies for industrial sustainability. *Procedia Manufacturing*, 33, 264–271.
10. Gunasekaran, A., McGaughey, E., Ngai, E. W. T., & Rai, B. K. (2009). E-procurement adoption in the Southcoast SMEs. *International Journal of Production Economics*, 122, 161–175.
11. Hassan, H., Tretiakov, A., & Whiddett, D. (2017). Factors affecting the breadth and depth of e-procurement use in small and medium enterprises. *Journal of Organizational Computing and Electronic Commerce*, 27(4), 304–324.
12. Högel, M., Schnellbacher, W., Tevelson, R., & Weise, D. (2018). Delivering on digital procurement's promise. *Boston Consulting Group*.
13. Hughes, J., & Ertel, D. (2016). The reinvention of procurement. *Supply Chain Management Review*, 18–23.
14. Ivanov, D., Dolgui, A., & Sokolov, B. (2018). The impact of digital technology and Industry 4.0 on the ripple effect and supply chain risk analytics. *International Journal of Production Research*. <https://doi.org/10.1080/00207543.2018.1488086>
15. Marikyan, D., & Papagiannidis, S. (2023). Unified theory of acceptance and use of technology: A review. In S. Papagiannidis (Ed.), *TheoryHub Book*. <https://open.ac.uk/ISBN:9781739604400>
16. Motaung, J. R., & Sifolo, P. P. S. (2023). Benefits and barriers of digital procurement: Lessons from an airport company. *Sustainability*, 15, 4610.
17. Oliveira, T., & Martins, M. F. (2011). Literature review of information technology adoption models at firm level. *The Electronic Journal Information Systems Evaluation*, 14(1), 110–121.

18. Pereira, R. C., Christopher, M., & Da Silva, A. L. (2020). Achieving supply chain resilience: The role of procurement. *Supply Chain Management: An International Journal*, 19, 626–642.
19. Singh, P. K., & Chan, S. W. (2022). The impact of electronic procurement adoption on green procurement towards sustainable supply chain performance: Evidence from Malaysian ISO organizations. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(1), 61.
20. Tornatzky, L. G., & Fleischer, M. (1990). *The processes of technological innovation*. Lexington Books.
21. Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425–478.
22. Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, 36(1), 157–178. <https://doi.org/10.2307/41410412>