Proceedings of the International Conference on Industrial Engineering and Operations Management

Publisher: IEOM Society International, USA DOI: 10.46254/AN15.20250140
Published: February 18, 2025

Navigating the Digital Shift: E-Procurement Adoption among Ghanaian Small and Medium Enterprises

Emmanuel Ahatsi and Oludolapo Akanni Olanrewaju
Department of Industrial Engineering, Durban University of Technology, Durban 4001
South Africa
22384754@dut4life.ac.za, oludolapoO@dut.ac.za

Lin Nie
Department of Applied Social Sciences, The Hong Kong Polytechnic University
Hong Kong, China
lin-apss.nie@polyu.edu.hk

Abstract

In this study, we employed the survey design to examine e-procurement implementation on the performance of small and medium enterprises (SMEs) in Ghana. We employed convenience sampling technique to choose a sample of 86 respondents, including owners, managers and procurement officers. Our findings reveal that e-procurement is moderately used in firms, and its usage significantly enhances procurement efficiency, reduces costs, and fosters stronger supplier relationships, thereby positively influencing overall firm performance. Nonetheless, inadequate information technology (IT) infrastructure, a shortage of skilled personnel, high implementation costs, and security issues impede broader adoption. These obstacles demonstrate the necessity for targeted investments in technology and training initiatives to facilitate effective implementation. Overall, our findings provide valuable insights into policymakers and practice within the SME sector.

Keywords

E-procurement; SMEs; procurement efficiency; challenges; performance

1. Introduction

Procurement represents a strategic tool for effective and proficient resource management, covering purchases of goods and services (Lysons and Farrington 2020; Sarpong et al. 2017). For small and medium enterprises (SMEs)—businesses with fewer than 250 employees and varying revenue thresholds, typically categorized into small enterprises (under 50 employees) and medium enterprises (50 to 250 employees), procurement enables them to acquire essential goods and services efficiently, optimize costs, and enhance competitiveness, thereby directly impacting their profitability and sustainability. Traditionally operated through manual processes, the dematerialization procurement (hereinafter, e-procurement) denotes a ground-breaking management initiative in today's business community. Nevertheless, the adoption of this novel procurement arrangement by private sector companies remains very limited due to varied factors (Alomar and De Visscher 2019). E-procurement leverages electronic platforms during the procurement process for speed, accuracy, transparency and efficiency. The literature is replete with expected and actual benefits that occasion the transition to e-procurement. Additionally, e-procurement enhances the propensity to upscale the distribution of tenders, improve procedural transparency, protect the environment and limit corrupt practices.

Like the rest of the world, Ghana has embraced this innovation in the procurement value chain for the abovementioned reasons. This has occasioned heightened research into various aspects of e-procurement, namely the feasibility of the

digital infrastructure, adoption intentions, challenges, and impacts, among others. For illustration, Addy et al. (2024) and Ofori, Light and Ankomah (2023) investigated e-procurement acceptance within the Ghanaian public sector, Charnor and Quartey (2024) studied adoption and performance implications and the moderating role of institutional quality, with varied results regarding determinants, feasibility and contextual factors. The adoption, utility, impacts and barriers to e-procurement implementation in Ghanaian SMEs have received limited scholarship compared to research within the public sector (Boateng 2021), partly due to incessant perceived and actual corruption in the latter and the circumventing capacity of this new procurement regime. That notwithstanding, Boateng (2021) and Dadzie, Nyamekye and Yamoah (2024) report a fair understanding of e-procurement, limited utility, pockets of impacts on performance, and several bottlenecks to its adoption. However, these studies did not examine how the firms integrated e-procurement systems into their procurement processes.

Consequently, our contribution aims to determine how SMEs integrate e-procurement systems into their overall procurement processes, usage and frequency, the effects on firm performance, and the associated challenges. We conceptualize 'the use of e-procurement' to imply the extent to which companies approve or disprove adopting electronic means to carry out procurement procedures (Alomar and De Visscher 2019). We described the methods presented after presenting the study's objective and literature review. We discussed our findings and concluded how the objectives were achieved and the implications thereof.

1.1 Objectives

In this study, the following specific objectives were set out to be achieved:

1. Determine the extent to which Ghanaian SMEs adopt and integrate e-procurement in the overall procurement value-chain process.
2. Examine the effects of e-procurement adoption on SMEs performance in Ghana.
3. Evaluate the relationship between e-procurement adoption and a SMEs performance in Ghana.
4. Identify the barriers to e-procurement implementation within Ghanaian SMEs.

1.2 Hypothesis

Null hypothesis (H_0): There is no significant relationship between e-procurement adoption and SMEs performance.
Alternate hypothesis (H_1): There is a significant relationship between e-procurement adoption on SMEs performance

2. Literature Review

E-procurement has emerged as a critical reform for enhancing efficiency and transparency in public sector operations globally. As organizations increasingly recognize the importance of technological solutions in improving management practices and service delivery, e-procurement stands out as a significant tool to combat corruption and inefficiencies (Charnor and Quartey, 2024). The literature indicates that e-procurement can lead to substantial cost savings and improved supply chain transparency, which is essential for both the public and private sectors (Fernandes and Vieira, 2015; Gunasekaran et al., 2009). However, despite its potential benefits, adopting e-procurement is often hindered by various challenges, including technological, organizational, and environmental factors. These challenges necessitate a comprehensive understanding of the barriers to e-procurement adoption, particularly in the context of SMEs, which are crucial for economic development.

Research has identified several key factors influencing SMEs' acceptance and use of e-procurement systems. Alomar and De Visscher (2019) found that facilitating conditions, attitudes towards use, and pressures from public purchasers significantly impact e-procurement acceptance, accounting for a notable portion of the variance in user attitudes. Furthermore, Ain et al. (2019) categorized these factors into four contexts: organizational, information systems (IS), individual user, and environmental. Each context highlights the importance of aligning organizational objectives with e-procurement initiatives, ensuring a reliable IT infrastructure, addressing human-related factors, and considering the broader business climate. Despite these insights, gaps in the literature regarding SMEs' specific organizational and environmental challenges (Addy et al. 2024; Ofori, Light and Ankomah 2023), particularly in developing countries where resources and infrastructure may be limited.

The Technology-Organization-Environment (TOE) framework has been instrumental in categorizing the challenges associated with e-procurement adoption. Mohungoo, Brown, and Kabanda (2020) identified technological challenges such as security and privacy concerns, organizational challenges, including resistance to change and lack of training, and environmental challenges related to regulatory frameworks and market conditions. These challenges are

compounded by the rapid evolution of Industry 4.0, which introduces new complexities in supply chain management and necessitates re-evaluating e-procurement processes (Nandankar and Sachan 2020). The literature suggests that while e-procurement has been widely adopted, many systems have failed due to inadequate consideration of these challenges, highlighting the need for further research to explore effective strategies for overcoming barriers to adoption. In addressing these gaps, the current study contributes valuable insights into the degree of e-procurement adoption among Ghanaian SMEs. By identifying specific challenges, this research aligns with previous findings while also expanding the understanding of the unique context faced by SMEs in developing countries (Afolabi et al. 2019; Tutu et al. 2019).

3. Methods

We employed the survey design to investigate the implementation of e-procurement within Ghanaian SMEs. The design was selected based on its potential to efficiently help us gather quantitative data from varied stakeholders within Ghanaian SMEs, ensuring a comprehensive analysis of e-procurement acceptance. This approach enables collecting an extensive range of perspectives, essential for appreciating the complexities of implementation across different organizational levels (Groves et al. 2011). Participants included owners/CEOs, managers, supervisors, and procurement officers, ensuring a comprehensive representation of perspectives across various organizational levels. This diverse participant pool is crucial for understanding the multifaceted nature of e-procurement adoption, as different roles may influence decision-making processes and implementation strategies. Convenience sampling was employed to select participants due to its expediency and effectiveness in reaching SMEs across various sectors. This approach facilitated the study to gather data quickly from available respondents (Hossan, Dato'Mansor and Jaharuddin 2023), which is crucial given the limited resources and time constraints often faced in SME research. While this method could introduce some bias, it permits a preliminary exploration of the topic within the context of Ghanaian SMEs. Descriptive statistics and regression analysis were applied to summarize and interpret the collected data. This analytical approach provides clear insights into the current state of e-procurement adoption, facilitating the identification of trends and patterns that inform future strategies.

4. Data Collection

The present study collected data through a structured survey questionnaire targeting key Ghanaian SME stakeholders, such as owners/CEOs, managers, supervisors, and procurement officers in Accra, the capital of Ghana. A total of 86 questionnaires were administered to capture diverse views regarding the adoption of e-procurement. The scopes that the survey instrument/questionnaire measured are perceived benefits, challenges of e-procurement, integration with the overall procurement process, and the level at which e-procurement is in use. All the questions were closed-ended and electronically distributed. The electronic distribution of questionnaires through email and online facilitated prompt responses to the study. It helped ensure that data was efficiently collected while reducing costs compared to traditional paper-based methods. The participants were informed of the confidentiality and anonymity of the responses, which Wiles, Crow Heath, and Charles (2008) guaranteed would help with honest and unbiased responses. The duration of eight weeks for data collection, from March to April 2023, allowed the respondents to complete the survey at any time they deemed appropriate. In this period, the researchers followed up on respondents through a reminder system to increase the rate of responses.

5. Results and Discussion

5.1 Demographic Profile of Respondents

The demographic profile of respondents indicates a balanced gender distribution, with 52.33% male and 47.67% female participants. Most respondents fall within the age brackets of 25–34 (29.07%) and 35–44 (24.42%), reflecting a youthful population. Regarding education, the majority hold a Bachelor's degree (34.88%), followed by Master's degree holders (24.42%). The SMEs represented cover diverse sectors, with Retail and Wholesale Trade (22.09%), Agriculture and Agro-processing (18.60%), and Manufacturing (12.79%) being the most common. Most respondents hold positions such as Owner/CEO (25.58%) or Employee (29.07%). Regarding operational tenure, 38.37% of firms have been in operation for 1–5 years, while 20.93% have over 10 years of experience. Regarding workforce size, most SMEs employ 6–20 employees (33.72%), followed by 1–5 employees (27.91%). These demographics provide a comprehensive view of the SME landscape in Ghana, highlighting a mix of small and medium enterprises across various sectors and organizational roles.

Table 1. Demographic Profile of Respondents

Demographic	Categories	Frequency	Percentage (%)
Gender	Male	45	52.33
	Female	41	47.67
Age	18-24	17	19.77
	25-34	25	29.07
	35-44	21	24.42
	45-54	13	15.12
	55 and above	10	11.63
Highest level of education	High school or below	8	9.30
	Diploma	15	17.44
	Bachelor's degree	30	34.88
	Master's degree	21	24.42
	Doctoral Degree		13.95
Type of SMEs in Ghana	Agriculture and Agro-processing	16	18.60
	Manufacturing	11	12.79
	Retail and Wholesale Trade	19	22.09
	Hospitality and Tourism	6	6.98
	Construction	7	8.14
	Information and Communication Technology (ICT)	6	6.98
	Education and Training Services	4	4.65
	Healthcare Services	5	5.81
	Transport and Logistics	5	5.81
	Financial and Professional Services	7	8.14
Position in the company	Owner/CEO	22	25.58
	Manager	21	24.42
	Supervisor	18	20.93
	Employee	25	29.07
Years in operation	Less than 1 year	14	16.28
	1-5 years	33	38.37
	6-10 years	21	24.42
	More than ten years	18	20.93
Number of employees	1–5	24	27.91
	6–20	29	33.72
	21–50	20	23.26
	Above 50	13	15.12

5.2 Extent to which Ghanaian SMEs adopt and integrate e-procurement

The results in Table 2 highlight the extent to which Ghanaian SMEs adopt and integrate e-procurement into their procurement processes. A notable proportion of firms utilize e-procurement systems for procurement activities, with 24.4% using them often and 9.3% very often, though a combined 37.2% report rarely or never using them. Integration appears more advanced, as 34.9% of respondents indicate that e-procurement systems are usually fully integrated, and 16.3% report very frequent integration, though 27.9% still rarely or never achieve full integration. While 46.5% frequently use e-procurement systems for tendering, purchasing, and contract management, a smaller 25.7% indicate rare or no use for these purposes. Despite these mixed levels of adoption, e-procurement is perceived as a driver of efficiency and transparency, with 32.6% stating it often improves these outcomes and 9.3% stating it does so very often. However, 29% report only occasional improvements, highlighting room for growth in adoption and integration.

Table 2. Extent to which Ghanaian SMEs adopt and integrate e-procurement

	Never	Rarely	Sometimes	Often	Very Often
Our organization regularly uses e-procurement systems to manage procurement activities.	8(9.3%)	24(27.9%)	25(29.1%)	21(24.4%)	8(9.3%)
E-procurement systems are fully integrated into our organization's procurement processes.	6(7.0%)	18(20.9%)	18(20.9%)	30(34.9%)	14(16.3%)
We utilize e-procurement systems to purchase goods and services.	14(16.3%)	28(32.6%)	13(15.1%)	16(18.6%)	15(17.4%)
We frequently use e-procurement systems for tendering, purchasing, and contract management.	6(7.0%)	10(11.6%)	23(26.7%)	40(46.5%)	7(8.1%)
The use of e-procurement systems has significantly improved our procurement efficiency and transparency	7(8.1%)	18(20.9%)	25(29.1%)	28(32.6%)	8(9.3%)

5.3 E-procurement and SMEs Performance

In Table 2, we present the findings on the influence of e-procurement on the performance of Ghanaian SMEs. Four constructs were used: procurement efficiency, reduction of procurement costs, enhancing supplier relationships, and overall firm performance. With mean scores of 3.42 (29.07% agree and 18.60% strongly agree), 3.42, 3.49, and 3.47, we found that respondents agreed that e-procurement adoption resulted in procurement efficiency, reduction of procurement costs, enhancing the relationships with suppliers, and overall firm performance across all the firms (see Table 2 for details). These findings indicate that e-procurement systems enable SMEs to streamline operations, lower expenses, and strengthen supply chain partnerships, ultimately enhancing organizational performance.

Table 3. Influence of e-procurement on the performance of Ghanaian SMEs

	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**	**Mean**
Improvement of overall procurement efficiency	10 (11.63%)	15 (17.44%)	20 (23.26%)	25 (29.07%)	16 (18.60%)	3.42
Reduction of procurement costs	12 (13.95%)	14 (16.28%)	18 (20.93%)	25 (29.07%)	17 (19.77%)	3.42
Enhancement of relationships with suppliers	9 (10.47%)	13 (15.12%)	22 (25.58%)	24 (27.91%)	18 (20.93%)	3.49
Improvement of overall company performance	11 (12.79%)	13 (15.12%)	19 (22.09%)	26 (30.23%)	17 (19.77%)	3.47

5.4 Relationship between e-procurement and SMEs performance

A regression analysis was performed to infer a causal relationship between e-procurement adoption and a firm's performance. Moreover, it provided a framework for testing hypotheses about the relationships between variables, including significance tests for individual predictors.

Table 4. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.730[a]	.534	.525	.55371

a. Predictors: (Constant), E-procurement adoption

The R-value of 0.730 indicates a strong positive correlation between e-procurement and SMEs performance. This suggests that as the adoption of e-procurement increases, there is a corresponding increase in SMEs performance. The R Square value of 0.534 is particularly noteworthy. It indicates that 53.4% of the variance in SMEs performance can be explained by e-procurement adoption. In other words, over half of Ghana's SME performance changes can be attributed to adopting e-procurement.

Table 4. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.492	.225		2.186	.030
	E-procurement adoption	.267	.077	.244	3.467	.001
a. Dependent Variable: SMEs performance						

The coefficient for e-procurement adoption is 0.267, with a standard error of 0.077. This positive value indicates that for every one-unit increase in e-procurement adoption, there is a corresponding 0.267 unit increase in the firm's performance. This relationship is statistically significant, as evidenced by the t-value of 3.467 and p-value (Sig.) of 0.001, well below the conventional 0.05 threshold for significance.

5.5 Challenges associated with e-procurement among SMEs

The results highlight key challenges to e-procurement implementation in Ghanaian SMEs. Respondents identified inadequate IT infrastructure as a major challenge, with a mean score of 3.42, where 32.56% agreed and 20.93% strongly agreed. The lack of skilled personnel was seen as a barrier, reflected in a mean of 3.44, with 29.07% agreeing and 22.09% strongly agreeing. High implementation costs were also a concern, yielding a mean score of 3.33, with 27.91% agreeing and 19.77% strongly agreeing. Additionally, security concerns emerged as a significant issue, with a mean of 3.37, supported by 27.91% agreeing and 20.93% strongly agreeing. See Table 3 for details. These findings emphasize the multifaceted obstacles SMEs face in adopting e-procurement systems effectively. They likewise suggest the need for targeted investment in technological capabilities, skills development, and addressing security risks to enable more widespread and effective e-procurement implementation within the SME sector.

Table 6. Associated challenges with e-procurement

	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**	**Mean**
Inadequate IT infrastructure is a major challenge	8 (9.30%)	12 (13.95%)	20 (23.26%)	28 (32.56%)	18 (20.93%)	3.42
Lack of skilled personnel as a barrier to adoption	10 (11.63%)	14 (16.28%)	18 (20.93%)	25 (29.07%)	19 (22.09%)	3.44
High implementation costs as a hindrance	9 (10.47%)	15 (17.44%)	21 (24.42%)	24 (27.91%)	17 (19.77%)	3.33
Security concerns as a major challenge	12 (13.95%)	13 (15.12%)	19 (22.09%)	24 (27.91%)	18 (20.93%)	3.37

5.6 Proposed Improvements

These findings have several implications for study and practice in e-procurement within Ghanaian SMEs. For the researchers, these identified challenges of lack of adequate IT infrastructure, inadequate personnel with essential skills, high implementation costs, and security concerns help identify the principal areas where further investigations may be analyzed. Future studies may look into strategies that can help overcome the identified barriers to improve the enhancement of e-procurement in similar contexts. These findings imply that practitioners must invest in adequate IT

infrastructure and workforce training to implement e-procurement successfully. SMEs should develop a comprehensive training program to improve employee skills and technological competencies. Besides, financial planning can be worked out to meet the high implementation costs either through the joint efforts of the technology providers or through government initiatives. Lastly, the security measures must be enhanced to instil confidence in the e-procurement system. In turn, this will help SMEs benefit from e-procurement by making them operationally more efficient and competitive in the market.

5.7 Validation

The survey results reveal a moderate rate of e-procurement use among Ghanaian SMEs, aligning with prior studies highlighting varying adoption levels in developing countries (Aboelmaged 2010; Ibem et al. 2016; Zulkarnain et al. 2023). While some respondents reported moderate usage, the frequency indicates that many engage with e-procurement systems "Often" or "Sometimes." This growing trend supports Afolabi et al. (2017), who noted increased adoption of e-procurement among Nigerian SMEs, contrary to the dominant use of traditional procurement, as Agboh (2015) reported. Notably, over 50% of respondents reported a high degree of integrating e-procurement systems into their procurement processes, reflecting findings by Fernandes and Vieira (2015) regarding efficiency gains. However, the presence of 6% of respondents not utilizing e-procurement underscores the need for strategic initiatives to enhance adoption. These findings illustrate that while e-procurement is becoming integral, significant gaps remain, necessitating targeted efforts to overcome technological and infrastructural challenges. The moderate e-procurement usage among SMEs in Ghana is primarily due to inadequate IT infrastructure (Boateng, 2021), which limits access to necessary tools and platforms (Asamoah, Opoku-Fofie and Asare-Bediako, 2022).

Additionally, the lack of skilled personnel to manage and operate e-procurement systems, coupled with high implementation costs, deters many SMEs from fully adopting these solutions (Mohungoo, Brown and Kabanda, 2020; Naeem, 2021; Sánchez-Rodríguez et al., 2019). Security concerns regarding data protection further exacerbate this hesitancy (Altayyar and Beaumont-Kerridge, 2016; Jama, Mwanza and Mwanaumo, 2024), leading to a cautious approach toward e-procurement integration. Thus, these factors do not provide the necessary fertile grounds/conditions for e-procurement to thrive.

The findings on the influence of e-procurement on the performance of Ghanaian SMEs reveal a predominantly positive and significant impact, with respondents acknowledging improvements in procurement efficiency, cost reduction, supplier relationships, and overall firm performance. This aligns with existing literature that highlights e-procurement's beneficial role in SMEs within developing contexts (Afolabi et al. 2017; Ibem et al. 2016). Notably, 47.67% of participants reported enhanced procurement efficiency, echoing Mutangili's (2019) assertion that e-procurement fosters productivity through better supplier collaboration and reduced transaction costs. Additionally, 48.84% of respondents acknowledged cost reductions, supporting Basak (2015) and Tiwari et al. (2019), who identified cost-cutting as a key advantage of e-procurement. The survey also indicated that 48.84% believe e-procurement strengthens supplier relationships, consistent with Sánchez-Rodríguez et al. (2020) and Hassan et al. (2017). Finally, the 50% of participants indicating improved overall performance corroborates Masudin et al. (2021), Waithaka, and Kimani's (2021) findings on e-procurement's effectiveness in enhancing business outcomes.

The findings on the challenges Ghanaian SMEs face in adopting e-procurement systems underscore critical barriers, including inadequate IT infrastructure, lack of skilled personnel, high implementation costs, and security concerns. Inadequate IT infrastructure restricts SMEs from accessing the necessary technology and tools for effective e-procurement (Soong, Ahmed and Tan, 2020), resulting in inefficient operations. The lack of skilled personnel means that even when systems are available, there are not enough trained individuals to implement and manage them, leading to further delays and challenges. High implementation costs and security concerns create additional reluctance among SMEs, as they fear financial strain and potential data breaches, discouraging them from transitioning to digital procurement processes. These obstacles align with previous research indicating impediments to e-procurement in developing countries (Afolabi et al. 2019; Ibem et al. 2016; Tutu et al. 2019). Specifically, 53.49% of participants emphasized the necessity for improved IT infrastructure, a need echoed by Aduwo et al. (2016), who noted that insufficient technology infrastructure hampers e-procurement adoption.

Furthermore, 51.16% identified unqualified personnel as a significant barrier, corroborating the findings of Tutu et al. (2019), who advocate for training initiatives to improve the skills and competencies of procurement officers in tandem with technological developments in the field. High implementation costs were cited by 47.68% of respondents, consistent with Angeles and Nath (2015), highlighting financial constraints for SMEs. Lastly, 48.84% emphasized

security issues, aligning with Davila and Palmer (2014), who identified technology-related risks as major challenges to effective e-procurement utilization. Addressing these barriers is essential for successful implementation.

6. Conclusion

This study investigated the extent of adoption and the impact of e-procurement systems on the performance of Ghanaian SMEs and discussed the associated challenges. Through an integrated survey, the study established that e-procurement is partly adopted, significantly enhancing procurement efficiency, cutting costs, improving supplier relationships, and raising the firm's overall performance. However, low levels of IT infrastructure, nonskilled personnel, high implementation costs, and perceived security issues stand in the way of broad diffusion. These findings emphasize the importance of targeted investment in technology and training in overcoming such barriers. We also identify that while e-procurement offers significant potential benefits for SMEs, addressing the challenges identified represents a vital opportunity to ensure full exploitation of these benefits. Generally, the study contributes to understanding the status of e-procurement in the Ghanaian context. Also, it provides practical insights into how SMEs could improve their procurement processes through technological solutions.

References

Addy, M.N., Addo, E.T., Abdulai, S.F., Kwofie, T.E., Aigbavboa, C.O. and Adade-Boateng, A.O., E-procurement acceptance in the Ghanaian public sector: an application of an extended technology acceptance model (TAM) in the construction industry. *Journal of Engineering, Design and Technology*, pp.1-22, 2024.

Aduwo, E. B., Ibem, E. O., Uwakonye, O., Tunji-Olayeni, P., and Ayo-Vuaghan, E. K. . Barriers to the uptake of e-procurement in the Nigerian building industry. *Journal of Theoretical and Applied Information Technology*, vol.89, no. 1, pp. 36-47, 2016.

Afolabi, A., Ibem, E., Aduwo, E., and Tunji-Olayeni, P. Digitizing the grey areas in the Nigerian public procurement system using e-Procurement technologies. *International Journal of Construction Management*, vol.22, no. 12, pp. 2215-2224, 2022.

Afolabi, A., Ibem, E., Aduwo, E., Tunji-Olayeni, P., and Oluwunmi, O. Critical success factors (CSFs) for e-Procurement adoption in the Nigerian construction industry. *Buildings*, vol.9, no. 2), pp. 47-62, 2019.

Agboh, D. K. Drivers and challenges of e-procurement adoption in the Ghanaian construction industry. International Journal of Construction Supply Chain Management, vol.5, no. 2, pp. 20-38, 2015.

Ain, N., Vaia, G., DeLone, W.H. and Waheed, M., Two decades of research on business intelligence system adoption, utilization and success–A systematic literature review. *Decision Support Systems*, vol.125, p.113113, 2019.

Alomar, M.A. and De Visscher, C., E-public procurement: Which factors determine its acceptance by small-to, medium-sized enterprises and large companies in Belgium? *International Review of Administrative Sciences*, vol.85, no. 2, pp.356-376, 2019.

Altayyar, A., and Beaumont-Kerridge, J. . An Investigation into barriers to adopting e-procurement within selected SMEs in Saudi Arabia. *Journal of Business and Economics*, vol.7 no. 3, pp. 451-66, 2016.

Angeles, R., and Nath, R. Critical success factors for the adoption of business-to-business electronic procurement. Communications of the IIMA, vol.5 no. 1, pp. 4-20, 2015.

Asamoah, K, Opoku-Fofie, I. and Asare-Bediako, E. "Barriers and Drivers of Electronic Procurement Adoption and Firm Performance: The case of Universal Banks in Ghana." *ADRRI Journal of Arts and Social Sciences* vol.19 no. 7, pp. 58-82, 2022.

Azanlerigu, J. A., and Akay, E. Prospects and challenges of e-procurement in some selected public institutions in Ghana. *Prospects*, vol.7, no. 29, pp. 61-76, 2015.

Basak, M. Achieving e-procurement benefits in an aviation MRO environment. *Operations and Supply Chain Management: An International Journal*, vol.9, no. 1, pp. 50-60, 2015.

Bayram, S., and Vayvay, Ö. E-procurement system and adoption for SMEs. In *Innovations in SMEs and conducting e-business: Technologies, trends and solutions* (pp. 19-34). IGI Global, 2011.

Boateng, G.O., *The Usage Of E-Procurement Systems And Its Impact On SMEs' Performance In Ghana* (Doctoral dissertation, Department of Supply Chain and Information Systems, Kwame Nkrumah University of Science and Technology), 2021.

Brandon-Jones, A., and Kauppi, K. Examining the antecedents of the technology acceptance model within e-procurement. *International Journal of Operations and Production Management*, vol.38, no. 1, pp. 22-42, 2018.

Charnor, I.T. and Quartey, E.K., Electronic procurement adoption and procurement performance: does institutional quality matter? *Business Process Management Journal*, vol.30, no. 6, pp.1783-1807, 2024.

Davila, A., Gupta, M., and Palmer, R. Moving procurement systems to the internet: The adoption and use of e-procurement technology models. *European Management Journal*, vol.21, no. 1, 11-23, 2003.

Dadzie, E.B., Nyamekye, B. and Yamoah, L.E., Analyzing the Factors Influencing the Integration of E-Procurement use in Small and Medium Enterprises in Ghana. *International Journal of Research and Scientific Innovation*, vol11, no. 7, pp.1207-1224, 2024.

Fernandes, T., and Vieira, V. Public e-procurement impacts in small and medium enterprises. *International Journal of Procurement Management*, vol.8, no. 5, pp. 587-607, 2015.

Gamal Aboelmaged, M. Predicting e-procurement adoption in a developing country: An empirical integration of technology acceptance model and theory of planned behaviour. *Industrial Management and Data Systems*, vol.110, no. 3, pp. 392-414, 2010.

Groves, R.M., Fowler Jr, F.J., Couper, M.P., Lepkowski, J.M., Singer, E. and Tourangeau, R., *Survey methodology*. John Wiley and Sons, 2011.

Gunasekaran, A., McGaughey, R.E., Ngai, E.W. and Rai, B.K., E-Procurement adoption in the Southcoast SMEs. *International Journal of Production Economics*, vol.122, no. 1, pp.161-175, 2009.

Hassan, H., Tretiakov, A., Whiddett, D., and Adon, I. Extent of e-procurement use in SMEs: A descriptive study. *Procedia-Social and Behavioral Sciences*, vol164, no. 7, pp. 264-270, 2014.

Hossan, D., Dato'Mansor, Z. and Jaharuddin, N.S., Research population and sampling in quantitative study. *International Journal of Business and Technopreneurship (IJBT)*, vol.13, no. 3, pp.209-222, 2023.

Ibem, E. O., Aduwo, E. B., Tunji-Olayeni, P., Ayo-Vaughan, E. A., and Uwakonye, U. O. Factors influencing e-Procurement adoption in the Nigerian building industry. *Construction Economics and Building*, vol.16, no. 4, pp. 54-67, 2016.

Ibem, E. O., Aduwo, E. B., Tunji-Olayeni, P., Ayo-Vaughan, E. A., and Uwakonye, U. O. Factors influencing e-Procurement adoption in the Nigerian building industry. *Construction Economics and Building*, vol.16, no. 4, pp. 54-67, 2016.

Ibem, E. O., Aduwo, E. B., Tunji-Olayeni, P., Ayo-Vaughan, E. A., and Uwakonye, U. O. Factors influencing e-Procurement adoption in the Nigerian building industry. *Construction Economics and Building*, vol.16, no. 4, pp. 54-67, 2016.

Jama, E. M., Mwanza, B. G., and Mwanaumo, E. M. E-procurement Adoption Barriers encountered by Small and Medium-sized Enterprises (SMEs) in the Republic of South Sudan. *African Journal of Commercial Studies*, vol.4 no. 1, pp. 48-68, 2024.

Listyawati, R., Chaerunisak, U.H. and Prastyatini, S.L.Y., Implementation of E-Procurement in Micro, Small and Medium Enterprises (MSMEs) in Yogyakarta. *IMPACTS: International Journal of Empowerment and Community Services*, vol.2, no. 1, pp. 9-15, 2023.

Lysons, K. and Farrington, B., *Procurement and supply chain management*. Pearson UK, 2020.

Mohungoo, I., Brown, I. and Kabanda, S., A systematic review of implementation challenges in public E-Procurement. In *Responsible Design, Implementation and Use of Information and Communication Technology: 19th IFIP WG 6.11 Conference on e-Business, e-Services, and e-Society, I3E 2020, Skukuza, South Africa, April 6–8, 2020, Proceedings, Part II 19* (pp. 46-58). Springer International Publishing, 2020.

Mutangili, S. K. The effects of e-procurement on organizational performance in the public sector in Kenya. *Journal of Procurement and Supply Chain, 3*(1), 1-9, 2019.

Naeem, M. "Uncovering and addressing the challenges in the adoption of E-procurement system: Adoption process stages in SMEs." *International Journal of Information Systems and Supply Chain Management (IJISSCM)* vol.14 no. 1, pp. 1-22, 2021.

Nandankar, S. and Sachan, A., Electronic procurement adoption, usage and performance: a literature review. *Journal of Science and Technology Policy Management*, vol.11, no. 4, pp.515-535, 2020.

Ngeno, K., and Kinoti, J. Effect of e-procurement on effective supply chain management process in energy sector in Kenya. *International Journal of Supply Chain Management*, vol.2, no. 3, pp. 18-37, 2017.

Ofori, D., Light, O. and Ankomah, J., Adoption intentions of electronic procurement among public sector organizations (PSOs) in Ghana: emerging economy perspective. *Journal of Public Procurement*, vol.23, no. 2, pp. 179-199, 2023.

Sánchez-Rodríguez, C., Martínez-Lorente, A. R., and Hemsworth, D. E-procurement in small and medium-sized enterprises; facilitators, obstacles and effect on performance. *Benchmarking: An International Journal*, vol.27, no. 2, pp. 839-866, 2019.

Sarpong, P.B., Du, J., Antwi, H.A., Udimal, T.B., Musah, A.A.I. and Khan, H.S.U.D., E-procurement adoption barriers in retrospect: a structural equation analysis of Ghanaian hospitals. *Canadian Journal of Applied Science and Technology*, vol. 5, no. 2, pp. 201-209, 2017.

Soong, K. K., Ahmed, E. M., and Tan, K. S. Factors influencing Malaysian small and medium enterprises adoption of electronic government procurement. *Journal of Public Procurement*, *20*(1), 38-61, 2020.

Tiwari, P., Sadeghi, J. K., and Eseonu, C. A sustainable lean production framework with a case implementation: Practice-based view theory. *Journal of Cleaner Production*, vol.277, 123078, 2020.

Tutu, S. O., Kissi, E., Osei-Tutu, E., and Desmond, A. Evaluating critical factors for the implementation of e-procurement in Ghana. *International Journal of Procurement Management*, vol.12, no. 1, pp. 1-14, 2019.

Waithaka, S. T., and Kimani, W. E. E-procurement practices and supply chain performance of manufacturing firms in Kenya. *International Journal of Supply Chain Management,* vol.10, no. 1, pp. 18-31, 2021.

Wiles, R., Crow, G., Heath, S. and Charles, V., The management of confidentiality and anonymity in social research. *International Journal of Social Research Methodology*, vol.11, no. 5, pp.417-428, 2008.

Zulkarnain, Z., Muda, I., and Kesuma, S. A. Factors Determining The Adoption of E-Procurement in Developing Countries: A Systematic Literature Review. *International Journal of Social Service and Research*, vol.3, no. 2, pp. 585-594. 2023.