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## **EXAMINATION OF E-PROCUREMENT SYSTEMS IN GHANA: EVIDENCE FROM MMDAS IN THE ASHANTI REGION**

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### **ABSTRACT**

This study examined the effects of e-procurement systems on the performance of Metropolitan, Municipal, and District Assemblies (MMDAs) in Ghana. This study focuses on the large number of MMDAs in the Ashanti Region. Despite a growing body of e-procurement literature in Ghana's public sector, no prior study has specifically examined its effect on MMDA performance, representing a critical gap in local governance digitalization research. This study employed a quantitative approach, combining descriptive and explanatory research designs. A purposive sampling technique was used to select 207 procurement personnel. This study's survey instrument achieved a Cronbach's alpha of 0.842. The multivariate regression model employed explained 82.5% variance in MMDA's performance outcomes. Findings demonstrate that e-requisitioning, e-sourcing, and e-payment significantly enhance MMDA performance in cost reduction, improved efficiency, and customer satisfaction. However, e-ordering demonstrates an insignificant impact. Findings indicate that e-procurement systems at MMDAs in Ghana reduce holding and ordering costs, decrease tendering cycle, and improve the management of procurement information. Key challenges of e-procurement systems, including maintenance costs, system complexity, cybersecurity vulnerabilities, political interference, and inadequate technical capacity, are identified. This study concludes that while e-procurement revolutionizes local government procurement, sustainability requires addressing infrastructure deficits, strengthening regulatory frameworks, implementing robust cybersecurity protocols, and developing comprehensive capacity-building programs. This study was limited to MMDAs in the Ashanti Region of Ghana. However, it provides empirical evidence to address critical gaps in local governance e-procurement practices in developing countries, especially Ghana.

**Keywords:** *E-procurement Systems, Public Sector Performance, Local Government Digitalization, MMDAs in Ghana*

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## **1.0 INTRODUCTION**

Many institutions are adopting emerging technologies to manage and reduce operational costs while achieving their objectives in this contemporary, challenging, and global commercial environment. E-procurement has become popular in most businesses due to innovations in procurement (Twishime & Mbonigaba, 2025). E-procurement refers to the integration of suppliers and customers into online purchasing networks. This system traverses different electronic purchasing levels, including ordering, information requests, reverse auctioning, tendering, sourcing, and enterprise resource planning. Business-to-Business (B2B) and Business-to-Consumer (B2C) systems are made possible by e-procurement (Shatta et al., 2020).

With complexities in the traditional manual method, e-procurement enhances procurement processes, improves joint relationships, performance, and internal procurement standards, enhances public procurement policies, and reduces public expenditure (Adjei-Bamfo et al., 2020; Twishime & Mbonigaba, 2025). In Ghanaian public institutions, e-procurement can streamline the public procurement lifecycle, from requisition to contract management, reduce corruption and fraud, ensure a fair and competitive bidding process, and enhance transparency, efficacy, and accountability in public spending.

Metropolitan, Municipal, and District Assemblies (MMDAs) in Ghana present a unique context for examining the effects of e-procurement in public institutions. For many decades, improper maintenance of equipment, collusion between the corporate community and public officials, political influence, and corruption have been among the few challenges in Ghana's public procurement. MMDAs spend a significant amount of money on procuring goods for their operations. Therefore, if e-procurement is not adopted, the extent and the agreement between the supplying company and these institutions cannot be traced.

E-procurement requires investment in technology, capacity building, and cybersecurity measures to ensure sustainability in public institutions. Therefore, the lack of robust technological infrastructure, inadequate specialists, and inadequate data security challenges affecting local governance in Ghana necessitate examining whether e-procurement adequately enhances the MMDAs performance.

Several studies have examined e-procurement in different jurisdictions and economies. However, most of these studies were extensively conducted in developed countries. Those within the African context focused on distinct dimensions of e-procurement (Shatta et al., 2020; Maepa et al., 2023; Mahuwi & Israel, 2024; Adebayo & Mutale, 2024). Findings of a comparative study in the Common Market for Eastern and Southern Africa (COMESA) countries are limited in the Ghanaian context (Twishime & Mbonigaba, 2025). Contemporary studies on e-procurement in Ghana have research shortcomings. The Ghana Electronic Procurement System (GHANEPS) continues to face systemic issues that impede full implementation and effectiveness (Salifu et al., 2023). Procurement irregularities continue to increase in the country, costing over 1.5 billion cedis since the adoption of e-procurement in 2019 (Musah et al., 2025). While these studies focus on public institutions (Dwomoh & Affum, 2023; Salifu et al., 2023; Addy et al., 2024; Musah et al., 2025), none examined the effects of e-procurement on MMDA's performance. This critical literature gap drives this study to examine e-procurement systems at MMDAs in Ghana, using the Ashanti Region with the highest number of MMDAs, as a case study. In specifics, this study's objectives are:

1. To assess the effectiveness of e-procurement systems implemented at MMDAs in Ghana.
2. To evaluate how e-procurement is reducing costs, enhancing efficiency, and improving customer satisfaction at MMDAs in Ghana.
3. To analyze the effect of e-procurement systems on MMDAs' performance.
4. To examine the challenges of e-procurement systems at MMDAs in Ghana.
5. To recommend best practices that can enhance e-procurement systems at MMDAs.

## **2.0 LITERATURE REVIEW**

### **2.1 Theoretical Framework**

This study integrates three theories to address theoretical gaps in the literature on e-procurement in local governance.

#### **2.1.1 *Technology Acceptance Model (TAM)***

TAM explains how people adopt and employ new technology. It posits that perceived usefulness and perceived ease of use influence users' attitudes on technology adoption (Almajali et al., 2023). Perceived usefulness is the extent to which an individual believes that utilizing a specific system will improve job performance, while perceived ease of use is the extent to which an individual believes that using the system will require minimal effort.

In e-procurement systems, TAM can measure the degree to which users perceive that automated solutions will enhance the speed, accuracy, and reliability of public procurement processing. The theory also examines users' perceptions of the effort necessary to acquire proficiency in and utilize the software interface. Intuitive e-procurement platforms provide simple menus, contextual assistance, and user-friendly reporting modules that enhance users' confidence in mastering them with minimal training (Almajali et al., 2023).

Critically, despite its predictive efficacy, TAM does not consider social influence and facilitating conditions, including organizational support, infrastructure, regulatory mandates, and cultural factors. These factors can significantly influence technology adoption decisions in practice. This study addresses this gap by integrating ancillary theories into the TAM framework.

#### **2.1.2 *Innovation Diffusion Theory (IDT)***

This theory explains how innovations are spread through various routes among members of a group. IDT posits that there are five factors; observability, trialability, compatibility, complexity, and relative advantage, that influence the adoption of an innovative technology (Overbye-Thompson & Hamilton, 2025). With this, relative advantage explains how innovation is perceived as superior to the existing situation. Compatibility explains the relationship between innovation and established workflows, values, and requirements. Complexity reflects the perceived challenge of understanding and using innovation, including user-friendly interfaces, easy navigation, and limited technical terminology. Trialability experiment technology through free trials or a pilot before complete deployment. Observability examines the visibility of concrete outcomes to external parties after the successful implementation and dissemination of technology.

IDT predicts adoption patterns and identifies key determinants but excludes other factors, including political resistance and financial constraints, in its estimates (Alshamaila & Papagiannidis, 2021). However, this theory offers insight into the varied adoption levels of e-procurement systems across the MMDAs in the Ashanti Region and the factors influencing their implementation progress.

#### **2.1.3 *Institutional Theory***

Institutional theory focuses on the influence of external and internal pressures on organizational behaviors and practices (Berthod, 2023; Risi et al., 2023). This explains how regulations and organizational structures shape behaviour and performance outcomes in public organizations. In local governance, this theory helps explain how decentralization policies, legal frameworks, and cultural norms affect MMDA's performance. It provides insights into understanding opportunities and challenges of e-procurement in MMDAs in Ghana. This study's emphasis on institutional environments aligns with Faik et al. (2020), who highlighted that societal change shifts multiple institutional logics in technology adoption and compliance decisions through changes in centrality, compatibility, and affordability.

## **2.2 Empirical Review**

Recent empirical studies have revealed diverse findings, highlighting challenges and opportunities of e-procurement in public institutions. For instance, a study examined how e-procurement systems influence the performance of county governments in Kenya (Nyagosia & Nyile, 2025). The study employed descriptive research and surveyed 267 public procurement officers across 14 counties. The study found that e-procurement systems (e-sourcing, e-ordering, e-payment, and e-invoicing) have positive and statistically significant effects on county government performance. The authors suggested that adopting e-procurement improves accountability, transparency, and efficiency in public procurement processes. However, the study concludes that inadequate digital infrastructure, system integration, and staff training are major challenges in adopting e-procurement.

In the Southern Highlands of Tanzania, a study examined how e-procurement reduces corruption in the public pharmaceutical procurement system (Mahuwi & Israel, 2024). The study found that improved transparency practices in e-procurement systems reduce corruption in the public pharmaceutical procurement system. The study identified accountability as a central pivot that drives efforts to combat procurement corruption. Similarly, Mushi et al. (2024) examined how procurement skills can influence the cross-functional coordination systems in Tanzania's public procurement. Using structured questionnaires across 11 local government institutions, findings revealed that strategic analytical skills, interpersonal skills, and technical IT skills influence cross-functional coordination. The study recommends that procurement managers improve and update their professional skills. This may resonate a similar wake-up call to MMDAs in Ghana.

Omwono et al. (2022) conducted a study examining the determinants of e-procurement implementation in public institutions in Rwanda, using Kigali as a case. The study examined data from 2014 to 2016 and found that e-procurement increases confidence and transparency, reduces operational costs, and increases competition among suppliers, thereby contributing to good governance. Findings demonstrate that public institutions in Rwanda have established initiatives that communicate e-procurement needs to all stakeholders. However, the study recommends that procurement staff possess technical competencies in the system and be knowledgeable in e-procurement practices and requirements.

Another study examined cybersecurity threats and mitigation strategies for e-procurement systems in the Nigerian public sector service industry (Sobulo & Olajide, 2025). Its findings revealed that brute force attacks and data breaches are significant cyber risks to e-procurement adoption. The study highlighted that pre-engagement security checks on personnel reduce insider attacks. These posit that e-procurement is vulnerable to cyberattacks. Data security is essential in digital transformation in procurement across public institutions; hence, the study's findings are critical for further investigation. Adebayo and Mutale (2024) examined the impact of AI-driven procurement systems in Zimbabwe and found that AI algorithms improve supplier selection and reduce procurement cycle times. Since AI adoption is gaining global recognition, the study is relevant. However, the study failed to assess whether local government institutions are ready to integrate AI into e-procurement. Therefore, this study proposes necessary policy interventions based on the viability of AI-driven procurement.

Kamoni (2020) conducted a study to assess the impact of emerging supply chain management practices on procurement performance of mega energy projects in Kenya. The study aimed to examine how regulatory frameworks moderate the effects of public-private partnerships (PPPs), global sourcing, procurement risk management, and e-procurement on procurement performance. The study found that these practices have a significant positive influence on procurement performance, but regulatory frameworks do not moderate the effect. Findings revealed that while private-sector collaboration improves innovation, it creates inefficiencies in regulatory control.

## **3.0 METHODOLOGY**

This section outlines the research methodology employed in this study, focusing on the effectiveness of e-procurement systems and their effect on the performance of MMDAs in the Ashanti Region of Ghana. The research philosophy underpinning this study is pragmatism, which emphasizes the practical application of research findings and the importance of addressing real-world problems. Pragmatism integrates qualitative and quantitative methods, enabling a comprehensive understanding of the research phenomenon. This philosophy is particularly relevant in the context of e-procurement systems, as it facilitates the exploration of both the measurable effects of these systems on MMDA performance and the subjective experiences of the procurement personnel involved.

This study employed a quantitative approach, combining descriptive and explanatory research designs. This approach described and observed phenomena without variable manipulations while establishing cause-and-effect relationships. A descriptive research design was adopted for this study, which is suitable for providing an in-depth understanding of the effectiveness of e-procurement systems within the selected MMDAs. The explanatory design enabled the collection of quantitative data through structured questionnaires, enabling the analysis of relationships between variables and the identification of trends and patterns. Furthermore, this study employed a quantitative research approach, which is characterized by the collection and analysis of numerical data. This approach is appropriate for testing hypotheses and establishing statistical relationships between variables. Using a quantitative methodology, the study aimed to quantify the effectiveness of e-procurement systems and their effects on the performance of MMDAs, thereby providing empirical evidence to support the research objectives.

## **3.1 DATA SOURCES, COLLECTION INSTRUMENTS, AND PROCEDURES**

The primary data source for this study was procurement personnel from all 43 MMDAs in the Ashanti Region of Ghana. A purposive sampling approach was employed to select participants with relevant knowledge about e-procurement systems and their implications for MMDA performance. This technique ensures that the sample is representative of individuals who can provide accurate and insightful data for analysis. Therefore, this study employed a sample size of 215 participants.

During the study, ethical principles and research guidelines were ensured. The data collection process involved first, the development of questionnaire using a thorough review of relevant literature and existing frameworks on e-procurement systems. Data was collected using a structured online survey tool (Qualtrics). Participants were provided with clear and comprehensive information about the study's purpose, procedures, potential risks and benefits, the voluntary nature of participation, and their right to withdraw at any time without penalty. Again, they were given clear instructions for completing the questionnaire and were reminded of the importance of honest and accurate responses. Before answering the questionnaires, participants were asked to consent to participate in this study.

The questionnaire utilized a five-point Likert scale, ranging from "Strongly Agree" to "Strongly Disagree," to measure respondents' level of agreement with various statements related to e-requisitioning, e-sourcing, e-ordering, and e-payment practices. The online survey tool was used to distribute questionnaires, collect data, and perform preliminary data management.

The researchers used a dedicated weblink to distribute a refined questionnaire to the selected procurement personnel via email and WhatsApp to the MMDAs. Follow-up reminders were sent to encourage participation and maximize response rates. The complete questionnaires were collected within ten (10) weeks. This study protected participants' identities through anonymization. All data were stored securely, with access restricted to the research team.

## **3.2 VIABILITY AND RELIABILITY OF DATA INSTRUMENTS**

This study implemented several measures to ensure data viability and reliability. First, the researchers adopted pilot testing on the questionnaire(s) with a small group of procurement professionals and academicians to ensure clarity, structure, and relevance. Feedback from the pilot test was used to refine

the questionnaire(s). The study employed Cronbach’s alpha on the data collected. Table 1 presents the findings.

**Table 1: Cronbach's Alpha Test**

<b>Category</b>	<b>Number of items</b>	<b>Cronbach's Alpha if Item Deleted</b>
Effectiveness of e-requisitioning	5	0.823
Effectiveness of e-sourcing	6	0.802
Effectiveness of e-ordering	5	0.809
Effectiveness of e-payment	5	0.826
E-procurement challenges	10	0.793
Effect on cost reduction	5	0.807
Effect on procurement efficiency	5	0.862
Effect on customer satisfaction	5	0.857
<b>Overall reliability and validity measure</b>		<b>0.842</b>

*Sources: Author's Construct (2025) with SPSS (version 26.1)*

Table 1 shows that each construct on the research instrument has a Cronbach's alpha value exceeding 0.70. The overall Cronbach's alpha value of 0.842 indicates that the data collected have passed the reliability and validity test (Hair et al., 2021). Hence, the data can be relied on for further analysis.

**3.3 DATA ANALYSIS TECHNIQUES**

The study employed the Statistical Package for the Social Sciences (SPSS) to analyze data. This software is used for descriptive statistical analysis to produce quantitative output, including mean and standard deviation values, while generating inferential statistical findings, including regression analysis, ANOVA, and a summary of the research model. Using the five-point Likert scale, mean values 1.0 - 1.4 represent severely disagree, 1.5 - 2.4 represent disagree, 2.5 - 3.4 represent neutral, 3.5 - 4.4 represent agree, and 4.5 – 5.0 represent highly agree.

A regression model was used to calculate the coefficients and statistical effects of the associations between the explanatory variables and the dependent variable(s) (MMDAs’) performance. The econometric model was developed and analyzed to determine the direction and magnitude of the effects of e-procurement systems on the performance of selected MMDAs. Using the study variables, the following model was employed.

$$P = \beta_0 + \beta_1(eR) + \beta_2(eS) + \beta_3(eO) + \beta_4(eP) + \varepsilon$$

Where:

- β0 is an intercept
- β1 - β4 are the coefficients for the independent variables.
- P: Performance of the MMDAs
- eR: e-requisitioning
- eS: e-sourcing
- eO: e-ordering
- eP: e-payment

The study used cost reduction, procurement efficiency, and customer satisfaction as proxies of MMDAs’ performance. The cumulative average of items was calculated to get the overall performance. The independent variables were the average effectiveness of the proxies of e-procurement systems, including e-requisition, e-sourcing, e-ordering, and e-payment.

**4.0 RESULTS AND DISCUSSIONS**

With the targeted sample of 215 respondents, 207 responses were obtained. This indicates that this study achieved a response rate of 96.28%. According to studies, a response rate above 70% is excellent,

between 60% - 70% is average, and between 50% - 59% is sufficient for analysis and presentation (Holtom et al., 2022; Althubaiti, 2023). Therefore, this study’s response rate remained satisfactory and admissible, increasing confidence in the generalizability of findings.

## 4.1 Respondents’ Demographics

The study analyzed respondents’ demographic characteristics, including gender, age, educational qualifications, and years of work experience. Findings are presented in Table 2.

**Table 2: Other Socio-Demographic Characteristics of Respondents**

Variable	Category	Percentage (%)
Gender	Male	58.45
	Female	41.55
Age (Years)	20 - 29	15.46
	30 - 39	28.02
	40 - 49	32.37
	50 - 59	24.15
Highest Qualification	Bachelor’s Degree	31.40
	Master’s Degree	49.28
	PhD	6.28
	Professional Certifications	13.04
Years of Experience	1 – 3	23.67
	4 – 7	28.99
	8 – 10	26.57
	10 +	20.77

*Sources: Field Survey (2025) with SPSS (version 21)*

According to the data collected, 58.45% of respondents are male, and 41.55% are female. Most respondents are in age groups centered on 40 years (i.e., 32.37% = 40-49 years, 28.02% = 30-39 years, 15.46% = 18-29 years, and 24.15% = 50-59 years). Furthermore, 31.40% hold a bachelor’s degree, followed by 49.28% with a master’s degree, 13.04% with a professional certificate, and 6.28% with a PhD certificate.

Most respondents, 28.99%, have worked in the MMDAs for 4-7 years, followed by 26.57% for 8-10 years, 23.67% for 1-3 years, and 20.77% for over 10 years. The findings indicate that the study’s respondents are skewed toward male dominance, with the majority having a higher educational background and having worked for the MMDAs for at least 4 years.

## 4.2 Descriptive Statistics

This section presents an analysis of the effectiveness of e-procurement systems, focusing on four main practices: e-requisition, e-sourcing, e-order, and e-payment. Furthermore, it presents an analysis of the challenges of implementing e-procurement systems in MMDAs. The study employed descriptive statistics to present average tendencies and standard deviations of variables.

### 4.2.1 Effectiveness of E-requisition System in Procurement

**Table 3: Effectiveness of E-requisition at MMDAs**

Statement	Mean	S. D
There are systems for managing requests for services and goods	<b>3.77</b>	<b>1.14</b>
E-requisition platform enhances transparency and accuracy	<b>4.16</b>	<b>0.75</b>

<b>Statement</b>	<b>Mean</b>	<b>S. D</b>
E-requisition procedures provide detailed information on every requisition made by the MMDA(S)	<b>4.17</b>	<b>0.79</b>
E-requisition procedures align with standard requisitioning practices.	<b>4.27</b>	<b>0.77</b>
E-requisition enhances the verification and approval of items purchased	<b>4.10</b>	<b>0.70</b>

*Sources: Field Survey (2025) with SPSS (version 21)*

According to Table 3, the overall mean of 3.77 indicates that respondents agreed MMDAs have a system for managing services and goods requests, with a dispersion of 1.14 among respondents. Most respondents (Mean = 4.16, SD = 0.75) agreed that the e-requisition platform enhances the transparency and accuracy of MMDA’s requisitioning.

Findings indicate that respondents agreed e-requisition procedures provide detailed information on every requisition made by MMDAs (Mean = 4.17, SD = 0.79). Furthermore, respondents agreed that e-requisition procedures aligned with the standard requisitioning practices (Mean = 4.27, SD = 0.77). The respondents agreed that e-requisition enhances verification and approval of purchases (Mean = 4.10, SD = 0.70).

These findings support the position that MMDAs employ e-requisition and follow standard requisitioning practices. This aligns with Omwono et al. (2022), who conclude that these ensure consistency, efficiency, adherence to established digital protocols and guidelines, streamline procurement processes, promote transparency, and reduce errors and delays. This revealed that e-requisition procedures offer an all-inclusive record of every requisition made by MMDAs. It suggests that the e-requisition system enables better tracking, analysis, and management of the requisition process. This resonates with Mahuwi and Israel (2024), who echoed that e-requisition systems enhance transparency, accountability, and decision-making on resource allocation and procurement activities within organizations.

#### **4.2.2 Effectiveness of E-sourcing System in Procurement**

**Table 4: Effectiveness of E-sourcing at MMDAs**

<b>Statement</b>	<b>Mean</b>	<b>S. D</b>
Suppliers are involved in the practices of e-sourcing	<b>3.80</b>	<b>0.83</b>
There is enough support for the use of e-sourcing practices	<b>4.19</b>	<b>0.82</b>
The MMDA has a procurement policy on e-sourcing	<b>4.56</b>	<b>0.61</b>
Negotiations between suppliers are performed online	<b>4.35</b>	<b>0.83</b>
Outsourced procurements are conducted online	<b>4.31</b>	<b>0.61</b>
Practices of reverse e-sourcing are performed	<b>4.13</b>	<b>0.69</b>

*Sources: Field Survey (2025) with SPSS (version 21)*

According to Table 4, respondents agreed that suppliers are involved in e-sourcing practices (Mean = 3.80, SD = 0.83). Respondents agreed that there is adequate support for using e-sourcing practices (Mean = 4.19, SD = 0.82). Most of the respondents strongly agreed that MMDAs have a procurement policy on e-sourcing (Mean = 4.56, SD = 0.61).

Regarding how negotiations are performed between suppliers, respondents agreed that such activities are done online (Mean = 4.35, SD = 0.83). While respondents agreed that outsourced procurements are conducted online (Mean = 4.31, SD = 0.61), they also agreed that reverse e-sourcing practices are performed (Mean = 4.13, SD = 0.69).

The findings align with Omwono et al. (2022), who found that public institutions with an e-sourcing policy outline the guidelines, rules, and procedures for online procurement activities. This posits that e-sourcing policies can ensure transparency, fairness, competition, efficiency, and accountability in procurement activities. While e-procurement negotiations are achieved between suppliers and customers through online platforms or specialized software, Santos and Dias (2024) revealed that they facilitate remote communication and agreements without physical meetings. Therefore, online negotiations can enhance convenience, speed, and flexibility, which promotes efficiency and productivity.

### 4.2.3 Effectiveness of E-order Systems in Procurement

**Table 5: Effectiveness of E-order at MMDAs**

Statement	Mean	S. D
Authorized purchase orders are processed online	3.98	0.97
The e-ordering system provides a quick means of ordering products	3.74	0.70
The e-ordering system assesses products before placing an order	4.11	0.92
The e-ordering system tracks all orders made	3.99	0.74
The e-ordering system ensures accurate prices for the goods purchased	4.38	0.59

*Sources: Field Survey (2025) with SPSS (version 21)*

Table 5 shows that respondents agreed that authorized purchase orders are processed online (Mean = 3.98, SD = 0.97) and that the e-ordering system provides a quick means of ordering products (Mean = 3.74, SD = 0.70). Respondents agree that the e-ordering system assesses products before making an order (Mean = 4.11, SD = 0.92), tracks all orders made (Mean = 3.99, SD = 0.74), and ensures that prices of goods purchased are accurate (Mean = 4.38, SD = 0.59).

The findings align with Mohale (2024), who found that e-ordering systems ensure that the prices recorded in the system are up-to-date, reliable, and consistent with agreed-upon terms. Findings revealed that MMDAs' e-ordering system enables users to evaluate products before finalizing their orders, aligning with Mauki et al. (2025), who identified detailed product descriptions, specifications, images, and even customer reviews. However, this study contradicts Marcilianus (2023), who noted the elimination of product assessment in e-ordering systems due to fraud and corruption, reducing stakeholders' satisfaction.

Therefore, the findings suggest that e-ordering systems help MMDAs avoid discrepancies or unauthorized price changes, promoting transparency and fair pricing in the procurement process. This empowers the MMDAs to make informed decisions by assessing the suitability and quality of products procured.

### 4.2.4 Effectiveness of E-payment Systems in Procurement

**Table 6: Effectiveness of E-payment at MMDAs**

Statement	Mean	S. D
The e-payment system automatically generates a receipt for purchases made	4.18	0.81
Receipts generated by the e-payment system can be tracked	3.77	1.05
The e-payment system signals and prevents double payment	3.89	0.90
The e-payment system makes accurate payment transactions	3.63	0.89
The e-payment system reduces payment errors	3.99	0.85

*Sources: Field Survey (2025) with SPSS (version 21)*

According to Table 6, respondents agreed that e-payment system automatically generates receipt for purchases made (Mean = 4.18, SD = 0.81), receipts generated by the e-payment system can be tracked (Mean = 3.77, SD = 1.05), that the e-payment system signals and prevents double payment (Mean = 3.89, SD = 0.90), makes accurate payment transactions (Mean = 3.63, SD = 0.89), and reduces payment errors (Mean = 3.99, SD = 0.85).

These findings align with Arthur et al. (2023), who found that e-payment systems automatically generate receipts for all procurements. According to Ibem et al (2021), this automated process eliminates the need for manual receipt(s) generation, ensuring accurate and timely documentation of transactions.

This study reveals that the e-payment system is designed to track payments, signal and prevent multiple payments, make accurate payments, and reduce errors. These findings align with Ibem et al. (2021), who found that e-payment systems can trace all payments, enabling users to monitor and track their payment history.

### **4.3 CONTRIBUTIONS OF E-PROCUREMENT SYSTEMS TO MMDAS**

This section evaluates how e-procurement is reducing cost, enhancing efficiency, and improving customer satisfaction at MMDAs in Ghana.

**Table 7: Contributions of E-procurement Systems to MMDAs**

<b>Statement</b>	<b>Mean</b>	<b>S. D</b>
<b>Cost Reduction</b>		
Reduced Administrative Cost(s) in procurement	<b>4.19</b>	<b>0.82</b>
Reduction in holding and ordering costs	<b>4.35</b>	<b>0.83</b>
Reduced paperwork in procurement	<b>4.20</b>	<b>0.89</b>
Reduced the operational costs of the MMDA	<b>3.92</b>	<b>1.06</b>
<b>Procurement Efficiency</b>		
Reduction in the cycling time of tendering	<b>4.37</b>	<b>0.74</b>
Reduction in time and labour costs	<b>4.24</b>	<b>0.80</b>
Improvement in process efficiency time	<b>4.19</b>	<b>0.67</b>
Minimize the workload of auditing procured items	<b>4.14</b>	<b>0.86</b>
<b>Customer Satisfaction</b>		
Improved management of procurement information	<b>4.26</b>	<b>0.68</b>
Users are satisfied with the procurement performance goals	<b>4.02</b>	<b>0.80</b>
Stakeholders are satisfied with e-procurement processes	<b>3.75</b>	<b>1.10</b>
Improves integrity and transparency in the procurement process	<b>3.89</b>	<b>0.84</b>

*Sources: Field Survey (2025) with SPSS (version 21)*

According to Table 7, with a mean value of 4.19 and a standard deviation of 0.82, respondents agreed that e-procurement has reduced administrative procurement costs. Through e-procurement systems, MMDAs are experiencing reductions in holding and ordering costs (Mean = 4.35, SD = 0.83), procurement paperwork costs (Mean = 4.20, SD = 0.89), and operational costs (Mean = 3.92, SD = 1.03). Furthermore, respondents agreed that e-procurement has reduced cycling time of tendering (Mean = 4.37, SD = 0.74), reduced in time and labour cost management (Mean = 4.30, SD = 0.82), improved efficiency in processing time (Mean = 4.19, SD = 0.67), and reduced the workload in auditing procured items (Mean = 4.14, SD = 0.86).

Regarding customer satisfaction, respondents agreed that e-procurement has improved the management of procurement information (Mean = 4.26, SD = 0.68), users are satisfied with the procurement performance goals (Mean = 4.02, SD = 0.89), stakeholders are pleased with the processes involved (Mean = 3.75, SD = 1.10), and the system has improved the integrity and transparency in the procurement process (Mean = 3.89, SD = 0.84).

The findings, including streamlining procurement procedures, reducing administrative costs, decreasing paperwork, and improving efficiency, align with those highlighted by Afolabi et al. (2022). Furthermore, Ngatman et al. (2020) identified that e-sourcing systems enhance cost savings, improve supplier relationships and satisfaction, reduce procurement timelines, and increase competitiveness, aligning with findings of this study.

Findings on e-procurement’s contribution to integrity and transparency, management of procurement information, auditing, and stakeholders’ satisfaction align with Masudin et al (2021) and Ibem et al (2021), who found that e-procurement systems enable contactless payments, reduce the risk of fraud, simplify financial record-keeping, reduce manual errors, and improve accuracy.

**4.4 EFFECT OF E-PROCUREMENT SYSTEMS ON MMDAS’ PERFORMANCE**

This section presents the multivariate regression analysis employed in this study.

**Table 8: Model Summary**

Model	R	R Square	Adjusted R-Square	Std. Error of the Estimate
1	.920 <sup>a</sup>	.825	.814	.18530

a. Predictors: (Constant), eR, eS, eO, and eP

Sources: *Field Survey (2025) with SPSS (version 21)*

Table 8 shows an R-square of 0.825, which is not far from the maximum value of 1. This implies that 82.5% of the variations in MMDA’s performance are explained by e-procurement systems (e-requisitioning, e-sourcing, e-ordering, and e-payment). This indicates that the model is fit for the analysis.

**Table 9: Analysis of Variance (ANOVA)**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	55.210	4	14.103	359.890	.000 <sup>b</sup>
	Residual	10.532	202	.027		
	Total	65.742	206			

a. Dependent Variable: Performance of MMDAs

b. Predictors: (Constant), eR, eS, eO, and eP

Sources: *Field Survey (2025) with SPSS (version 21)*

Table 9 shows a significant value of 0.00 ( $p < 0.05$ ), a degree of freedom (df) of 4, and an F-statistic value of 359.890. This indicates the statistical significance of the multivariate regression analysis model employed by this study.

**Table 10: Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.012	.117		.106	.916
eR	.508	.025	.588	20.044	.000
eS	.281	.040	.304	6.958	.000
eP	.169	.040	.158	4.274	.000

eO	.038	.031	.041	1.212	.227
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a. Dependent Variable: Performance of MMDAs

**Sources: Author's Construct (2025) with SPSS (version 26.1)**

According to Table 10, e-requisitioning (eR) has a significant positive effect on MMDAs' performance (Beta = 0.588, Sig. = 0.000). This indicates that a unit increase in effective e-requisitioning is associated with a 0.588-unit improvement in overall (MMDAs') performance. This dominant effect aligns with TAM's proposition that systems perceived as useful and easy to use are more comprehensively adopted. Therefore, procurement personnel who find the e-requisitioning platform intuitive and transparent are more likely to adopt it fully, generating measurable performance gains.

E-sourcing (eS) exerts a statistically significant and positive effect (Beta = 0.304, Sig. = 0.000), suggesting that online supplier engagement and competitive tendering reduce procurement costs and improve service quality. This aligns with the institutional theory such that the existence of formal e-sourcing policies creates a normative environment that legitimizes and reinforces supplier participation in digital procurement channels. E-payment (eP) demonstrates a significant positive effect (Beta = 0.158, Sig. = 0.00). This reflects the efficiency gains from automated receipt generation, payment tracking, and error reduction documented in Table 6.

Conversely, e-ordering (eO) yields a positive but statistically insignificant effect on performance (Beta = 0.041, Sig. = 0.227 > 0.05). This result does not imply the absence of e-ordering functionality since Table 5 confirms its use. However, this indicates that e-ordering as currently implemented does not translate into statistically discernible performance improvements. This may reflect system complexity, incomplete integration with inventory and supplier management platforms, or stakeholder resistance to change, all of which are consistent with IDT's emphasis on compatibility and complexity as barriers to adoption.

These findings align with and extend empirical evidence on e-procurement and performance across African public institutions. The significant eR and eS coefficients obtained in this study are consistent with Boafo et al. (2020), who found that e-procurement systems improve transparency in supplier selection, procurement management, and e-tender appraisal in the Ghanaian public sector. Similarly, Arthur et al. (2023) identified e-payment adoption as a catalyst for improved resource allocation, service quality, and accountability in Tanzania, corroborating this study's significant eP finding on MMDA(s) in Ghana.

Critically, however, prior studies examined heterogeneous public institutions rather than MMDAs specifically. This study's findings demonstrate regression-based evidence that e-requisitioning is the dominant performance driver among e-procurement components in MMDAs. This represents a distinction with direct policy relevance for the Public Procurement Authority (PPA) of Ghana. The insignificance of e-ordering contradicts Mauki et al. (2025), who reported a positive effect between e-ordering and supply chain performance in Kenyan retail chains. This suggests that institutional factors in Ghanaian local government, including political interference and inadequate technical capacity, moderate the effect of e-ordering in ways not observed in private sector settings. Theoretically, this study's regression pattern affirms the integrative framework employed. TAM explains the performance gains of more user-friendly components (e-requisitioning, e-payment), while IDT and institutional theory account for the adoption barriers that suppress e-ordering's performance contribution.

**4.5 CHALLENGES OF E-PROCUREMENT SYSTEMS**

This section presents findings of the challenges of e-procurement systems at MMDAs in Ghana.

**Table 11: Challenges of E-procurement Systems at MMDAs**

Statement	Mean	S. D
Lack of qualified personnel	3.84	0.75

<b>Statement</b>	<b>Mean</b>	<b>S. D</b>
Lack of user friendliness	<b>3.97</b>	<b>0.88</b>
Data security and privacy challenges.	<b>3.62</b>	<b>0.92</b>
Poor network system	<b>3.80</b>	<b>0.83</b>
Cost of maintaining the e-procurement system	<b>4.35</b>	<b>0.83</b>
Lack of management support	<b>3.99</b>	<b>0.90</b>
Some key stakeholders' resistance to change	<b>4.04</b>	<b>0.91</b>
High political interest	<b>4.24</b>	<b>0.80</b>
Cybersecurity threats	<b>4.09</b>	<b>0.68</b>
Complexity and incompatibility	<b>4.11</b>	<b>0.83</b>

*Sources: Author's Construct (2025) with SPSS (version 26.1)*

Table 11 shows that respondents agreed that lack of user friendliness of the e-procurement system (Mean = 3.97, SD = 0.88), data security and privacy issues, including cracking and hacking of e-procurement systems (Mean = 3.62, SD = 0.91), poor network system (Mean = 3.80, SD = 0.83), complexity and incompatibility of the e-procurement system (Mean = 4.11, SD = 0.83), and cyber security threats (Mean = 4.09, SD = 0.68) are some of the technical challengers of the e-procurement system at MMDAs.

Other challenges include dearth of qualified staff to work on the e-procurement system (Mean = 3.84, SD = 0.75), cost of maintaining the e-procurement system (Mean = 4.35, SD = 0.83), lack of management support (Mean = 3.99, SD = 0.90), some key stakeholders' resistance to change (Mean = 4.04, SD = 0.91), and high political interest in the e-procurement system (Mean = 4.24, SD = 0.80). These findings, particularly the cost of maintaining the e-procurement system, align with Almajali et al. (2023), who noted that these costs emanate from regular software updates, which are necessary to keep the system up-to-date and compatible with evolving technologies. Gunasegaran et al. (2023) stated that these costs include investments in data security measures, such as firewalls, encryption, and cybersecurity protocols. Furthermore, complexity and incompatibility challenges of the e-procurement system align with previous findings (Gurgun, 2024; Shatta et al., 2020). These can hinder the smooth flow of information, create manual workarounds, or require additional resources to enable interoperability.

## **5.0 POLICY RECOMMENDATIONS AND IMPLICATIONS**

This study proposes several critical policy implications for Ghana's local governance landscape. First, e-ordering system functionalities must be enhanced to accommodate quality user interface design and integration protocols, addressing the identified performance gap. Due to maintenance costs, lack of qualified staff, data security, and cybersecurity issues, Ghana's PPA should establish a dedicated technology support system to ensure sustainable digital infrastructure and reliable service delivery. Regular cybersecurity audits and data protection protocols must be implemented across all MMDAs. This addresses long-term financial sustainability and ethical vulnerability considerations highlighted by respondents.

Furthermore, procurement officers in MMDAs must possess the requisite digital literacy rather than retroactive training techniques suggested in previous studies. This aligns with TAM's perspective, suggesting that comprehensive capacity-building programs must precede system deployment. Independent oversight mechanisms with transparent reporting structures should be established to reduce corruption risks and maintain accountability. This will address the alarming political interference identified in this study.

The Ministry of Local Government should develop standardized hybrid e-procurement models. This would allow flexibility in MMDAs' operations within centralized regulatory management, matching benefits with consistent requirements. With the majority of MMDAs in the Ashanti Region,

pilot programs testing AI-driven procurement enhancements could provide scalable solutions for national rollout. Implementation success should require moving beyond isolated technical solutions toward holistic systemic approaches. This should integrate stakeholder engagement, continuous feedback mechanisms, and adaptive governance structures that acknowledge the dynamic nature of digital transformation in resource-constrained environments.

## **6.0 CONCLUSIONS**

This study concludes that MMDAs in the Ashanti Region of Ghana have operationalized e-procurement systems encompassing e-requisitioning, e-sourcing, e-ordering, and e-payment. These systems adhere to standard procurement practices. E-procurement policies ensure online outsourcing and supplier negotiations, while the e-ordering and e-payment modules provide systematic product assessment, order tracking, and automated financial records.

The multivariate regression analysis reveals that e-requisitioning, e-sourcing, and e-payment exert significant positive effects on MMDAs' performance, with e-requisitioning being the dominant driver (Beta = 0.588), followed by e-sourcing (Beta = 0.304) and e-payment (Beta = 0.158). E-ordering, while functionally present, does not yet produce a statistically significant performance effect (Beta = 0.041, Sig. = 0.227). This finding is attributable to systemic challenges, including political interference, inadequate technical capacity, and system incompatibility. These challenges collectively impede GHANEPS from realizing its full institutional potential.

This study demonstrates that integrating TAM, IDT, and institutional theory provides a more comprehensive explanatory framework for e-procurement adoption in local government. TAM explains why more user-centric components yield stronger performance returns, IDT accounts for differential adoption levels across MMDAs, and institutional theory illuminates how regulatory and normative environments enable or constrain digitalization gains. This integrated theoretical approach advances related literature. Empirically, this study quantifies the differential performance contributions of individual e-procurement components at the MMDAs' level in Ghana. This addresses a critical gap in the literature on local government digital transformation. This study, therefore, concludes that while e-procurement has materially transformed procurement processes in Ghanaian MMDAs, translating system adoption into sustained institutional performance gains requires deliberate policy action to address infrastructure, capacity, and governance constraints.

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