



Assessing the Extent of Electronic Procurement Adoption Challenges in the Public Sector of Ghana

Zaruk Narsam Salifu*, Clement Nangpiire, Abdul-Aziz Dawdi, Fatawu Yussif

Simon Diedong Dombo-University of Business and Integrated Development Studies, Ghana, West Africa. *Email: zaruksalifu@gmail.com

Received: 02 January 2023

Accepted: 10 March 2023

DOI: <https://doi.org/10.32479/ijefi.14131>

ABSTRACT

Electronic procurement implementation challenges are highly noticed in many African countries including Ghana despite the enormous benefit seen in nations that have adopted e-procurement. This study is quantitative by design and seeks to examine the extent of challenges that affect the implementation of electronic procurement. Knowledge of the extent of the challenges is essential to policy implementers to identify the significant challenges and the less significant challenges and prioritize their spending thereof due to the limited availability of resources. A total of three hundred and thirty-three (333) respondents' views were considered. The one-way analysis of variance is adopted to analyze the extent of e-procurement implementation challenges in public institutions and coefficients were reported at 95% CI and 5% significance level using (SPSS v20.0). The overall finding indicates that ICT contributes more to the implementation challenges of e-procurement than the institutional, employee, and supplier factors. Based on the finding, we recommend that regular training or seminars should be organized to equip employees with the necessary knowledge about e-procurement processes and procedures; ICT infrastructure needs of the public institutions must be given priority to ensure the smooth adoption of electronic procurement.

Keywords: Electronic-Procurement, Challenges, Public Sector, Adoption

JEL Classifications: M19 Business Administration: others

1. INTRODUCTION

Procurement is significant in institutional performance and a strategic means that can promote organizational growth (Khanapuri et al., 2011.). In the view of Tutu et al. (2019) adopting e-procurement in many parts of the world has impacted positively in the reduction of cost, low bureaucratic procurement process, low level of corruption, promotes compliance and procurement standardization. Aldenius and Khan (2017) explain that e-procurement is the adoption of electronic platforms or techniques for processes. According to Khanapuri et al. (2011) previous technologies such as electronic data interchange (EDI) and current advancements in digital procurement along with other tools such as e-auction, reverse e-auction, e-retailing and request for information (RFX) tools have enhanced collaboration which has increased cost and time savings. According to Williams and Hardy (2007) and Ocloo et al. (2020), electronic procurement

is an aspect of the business-to-business (B2B) e-commerce and information system (IS) which enhances the transformation of business processes and practices. Although the public procurement authority (PPA) has vigorously pursued the implementation of electronic procurement in public institutions in Ghana, its full implementation is still not realized (Tutu et al., 2019). Hamma-Adama and Ahmad (2021) posit that the lack of awareness of stakeholders including the government on the benefits of deploying electronic procurement in obtaining fiscal independence poses an obstacle to the adoption of electronic procurement.

Although the country's Public Procurement Act 2003 (Act 663) as amended Act 2016 (Act 914) has shown that public procuring institutions have many stages of procurement, these processes do not use electronic platforms. For example, it is not a secret since recent evidence from researchers suggests that public procuring institutions' tender notices and award notices are not

well published and not all records of the procurement processes are saved in recoverable systems (Tutu et al., 2019; Addo, 2019; Boafo and Ahudey, 2020). Procurement notices and information dissemination can be enhanced through electronic procurement adoption and web technology can allow data to be stored on the electronic system. This will enhance public access to information about public procurement on time and in the correct format at a minimum cost. It also assists providers to gain access to public procuring entities' procurement plans and bid documents via the internet which will result in competition between prospective bidders (Tanner et al., 2008; Sava and Dragoş, 2022). The current literature holds the view that e-procurement has attracted the attention of both researchers and practitioners and yet few organizations implement e-procurement (Boafo and Ahudey, 2020).

However, there has been a significant relationship between e-procurement and the performance of procurement in an organization. In this light, Krisanthi et al. (2014) argue that Consistent improvement in internet technology offers the opportunity to ensure transparency and efficiency in the procurement of goods and works. In the management field now, e-procurement has altered business transactions. The basic level of e-procurement ensures a change in the purchase of business goods. But at the strategic level, it would promote the acquisition of resources from business processes to strategic sourcing activities (Rajkumar, 2001; Kim et al., 2015). The important function of business relationships now is to provide two-way communication, cross-functional teams and high purchasing power (Kamotho and Kamotho, 2014). Due to this, many companies have developed a deeper relationship with their suppliers than long-term cooperation. Institutions are poised globally in improving their suppliers' performance through the exchange of staff, provision of training and tools, technologies and performance evaluation (Azanlerigu and Akay, 2015). According to Kumar and Routroy (2017) and Sambasivan et al. (2009), supplier development is closely related to client-supplier performance improvement if e-procurement is adopted and promotes institutional performance.

This study is to measure the extent of challenges that affects the implementation of e-procurement in public institutions in Ghana. The challenges are examined to identify those among the challenges that significantly impede the implementation of e-procurement processes. This is to assist stakeholders including policy implementers to uncover where their attention needs to be focused given the limited availability of resources to ensure the implementation of e-procurement.

2. LITERATURE

2.1. Overview of the Electronic Procurement Process

The Chartered Institute of Procurement and Supply (CIPS) (2010) identified the six phases of e-procurement that are used in the procurement process. This is further supported by Boafo and Ahudey (2020) who outline the levels of processes in e-procurement to include: online tendering, online sourcing, online auction/reverse auction and online ordering. According to Tavares (2011) there exist stages in the procurement process and

e-platforms prevent consistent paperwork which is common in the old system of procurement. It includes

E-Sourcing- the stage where information regarding what the institution intends to procure is disseminated online to assist tenderers to have a full understanding of the contract package in order to be able to bid for the contract. E-Evaluation- the stage where suppliers are shortlisted through electronic data tendered in by them and evaluated using a computer application to obtain the particulars of every contractor as a required standard for contract award criteria. E-Award and e-contract: the stage where the contract is awarded by the public contracting authorities through an electronic platform, the e-contract awarded is then recorded into the main procurement platform to help ensure that agencies avoid the use of excessive paperwork in the processes of contract award. E-Execution is the stage where the execution of the contract award is complete and the e-platform is then used to carry out a successful assessment of the electronic processes leading to the execution of the contract. E-Evaluation and auditing: the final evaluation and auditing which is necessary for public procurement are to ensure that the resources specifically allocated achieve the desired outcomes.

2.2. Challenges of E-Procurement Implementation

According to Mohungoo et al. (2020), procurement is vital in the recent competitive business environment and its impact on public institutions cannot be underestimated. They insist that the relevance of procurement in this contemporary business environment is still bedeviled with many challenges that need to be addressed to ensure the efficient and effective operation of the procurement unit within the organization. According to Brandon-Jones and Kauppi (2018), even though institutions have adopted e-procurement systems, there is however a widespread undeserving performance from the implementation. They maintain that the poor outcomes of these results are alluded to the inability of many institutions to transform properly the adoption of e-procurement decisions taken at the strategic level down to the individual employees' level for acceptance.

According to Tutu et al. (2019), the challenges of implementing e-procurement are noticed in areas such as IT infrastructure development, policy legislation and regulation, security issues, competency of procurement practitioners and government commitment. They insist that to adopt e-procurement, the management of organizations should emphasize sufficient training, education, workshops and seminars to build the capacity of procurement practitioners to be able to practice professionally for the organization to obtain the needed benefit of adopting e-procurement. This confirms the study by Steinberg (2003) who insists that the government online procurement system is abysmal in terms of adoption, thus many countries have failed in their quest to adopt e-procurement as being advocated for by world leaders. The view of Addo (2019) on the adoption of electronic procurement system indicates numerous challenges associated with the technological change in implementing e-procurement and these include: inadequate legal framework, lack of employee competencies, less technological infrastructure to merge e-commerce to other systems that are related to security

in e-procurement transaction of business and information system (IS). Kalakota et al. (2001) insist that to implement e-procurement, companies must state clearly their business challenges and the gap e-procurement would solve if implemented.

The study conducted by Angeles and Nath (2007), highlighted some essential challenges of e-procurement implementation such as Poor integration of systems and standardization issues; insufficient market service and the final user refusal; unexpected or maverick buying as well as the cumbersome nature of integrating e-procurement with similar systems. Another study by Azanlerigu et al. (2015) reveals that employee incompetence, inadequate technological infrastructure, security of related procurement transaction data and inadequate legal framework hinder e-procurement implementation in the public sector. They posit that the continuous exit of employees reduces employee competency in the organization, and the lack of legal backing on e-procurement also impedes its implementation in Ghana's public sector. According to Davila and Palmer (2002) there exist four challenges with the implementation of e-procurement systems. These challenges include internal business risk, external business risk: technology risk and e-procurement process risk. E-procurement is now mandated in many institutions but the enforcement is highly difficult which makes compliance and acceptance of the system abusive by users and so they find routes to flout the mandated procurement procedures (Croom and Brandon-Jones, 2016).

2.3. Theoretical Foundation

2.3.1. Technology acceptance theory

The study was supported using the technology acceptance model or the theory of planned behavior. Technology Acceptance Model (TAM) theory is proposed by (Davis, 1989). The theory proposes the actioned of perceived ease of use (PEOU) and the action of perceived usefulness (PU) of technology to have a significant contribution to the user's perspective Siricha and Theuri (2016). This is a theory widely adopted in many studies to comprehend the adoption of new technology in government institutions (Aboelmaged, 2010; Wahid, 2010; Davis, 2012). TAM has critical features to investigate and evaluates the impeding factors that influence the user acceptance of new technologies. This has assisted companies to increase their performance by ensuring usage and acceptance, and also providing individual differences, social aspirations, beliefs, attitudes, and situational impacts (Gupta and Gupta, 2020). This theory indicates that the usage of technology depends on the user's feelings and the perceived advantage of the system. The individual's positive or negative perception determines the impression of the individual towards that technological use. Several of these studies have resorted to perceived usefulness and perceived ease of use as key determinants of user technology adoption patterns. In light of these explanations, the perceived usefulness of the system was classified under the technological factors challenges whilst the perceived ease of use of the system was classified under the institutional, employee and supplier challenges respectively. This study will further explore these factor challenges of implementing e-procurement and determined the extent level of the factor challenges on government institutions in Ghana.

2.3.2. Transaction cost theory

The origin of transaction cost theory is traced in Coase's (1937) classic article, The Nature of the Firm, where he explains markets and hierarchies as alternative structures of governance. Coase maintained that the decision between markets and hierarchies was clearly explained principally by transaction cost differences. The impediments in the implementation of the transaction cost theory were later settled by William (1975) who posits that the optimum organizational structure achieves economic efficiency. He believes that the goal of any organization is to minimize the cost associated with the transaction. The transaction cost theory is divided into transaction risk and coordination cost. Transaction cost theory could serve as a good starting point for the analysis. Transaction costs can be divided into coordination costs and transaction risk (Harrington, 2011). Previously, transaction cost theory looked at the difference between market and hierarchical governance. Coordination costs are the direct costs of integrating decisions between economic activities. Transaction risk is associated with the exposure to being exploited in the relationship (Handfield, 2013). The theory further proposes four related costs associated with the transaction cost theory. Uncertainty and asset specificity are two factors, which increase coordination costs and transaction risk, respectively (Nolan, 2009). This theory forms the basis for identifying the risk and cost aspects that serve as challenges to the adoption of e-procurement.

3. METHODOLOGY

This paper utilizes a quantitative methodology through an in-depth analysis that seeks to find out the extent of challenges in implementing e-procurement in Ghana's public institutions. The study exclusively focused on only public institutions in Ghana, which comprises of Ministries, Department and Agencies (MDA's) established under the state and as such, a survey method was utilized to extensively discuss the extent of e-procurement implementing challenges in public institutions. The survey method is widely used in many authored research to obtain a relevant understanding of a phenomenon under study (Yin, 2003). The data was objective and quantitative and as such the positivist philosophy is adopted. This quantitative design of the study is deductive. The researchers employed the technique of questionnaires as means of data collection. Data were obtained from respondents at all levels of the public institutions in Ghana which comprises Ministries Department and Agencies (MDAs). The questionnaire was designed in Google format and distributed across to MDA's in Ghana. Respondents views were considered based on the specify position they occupy. This process of selection is purposive because the information required for the study could best be provided by officers whose job schedule is procurement related. With the study population of two-thousand (2000), the sample size was three hundred and thirty-three (333) and it was determined using the Yamane (1967) formula. The

Table 1: Reliability statistics

Cronbach's alpha	Cronbach's alpha based on standardized items	N of items
0.935	0.940	4

Source: Fieldwork 2022

Table 2: Summary of rating of e-procurement challenges

Factor challenges	n	Mean	SD	Standard error	95% confidence interval	
					Lower bound	Upper bound
ICT challenges	333	4.43	0.887	0.137	4.15	4.71
Institutional challenge	333	3.90	0.790	0.122	3.66	4.15
Employee challenge	333	3.38	0.962	0.148	3.08	3.68
Supplier challenge	333	2.93	1.091	0.168	2.59	3.27
Total	1332	3.66	1.088	0.084	3.50	3.83

Source: Fieldwork 2022

Table 3: Test of homogeneity of variance table

Levene statistics	Df1	Df2	Sig
1.329	3	164	0.267

Source: Fieldwork 2020

Table 4: ANOVA table for e-procurement adoption

Group factors	Sum of square	df	Mean square	F	Sig
Between groups	53.065	3	17.688	20.062	0.000
Within groups	144.595	164	0.882		
Total	197.661	167			

Source: Fieldwork 2022

formula as stated: $n = N/1 + N(e)^2$. Data obtained focused on the extent of e-procurement implementation challenges in public institutions. Respondents views were obtained through Google form designed. The first (333) data were considered and the link was close from respondents for further participation. The Statistical Package for Social Sciences (SPSS v20.0) was used to analyze the one-way analysis of variance that seeks to measure the level of challenge of e-procurement implementation of public institutions in Ghana.

The data obtained was tested for internal consistency using SPSS and this produced a Cronbach's alpha results of 0.935 which is generally considered good. Questions were properly worded in a negative direction and this accounted for the accurate internal consistency results (Table 1).

4. RESULTS AND FINDING

4.1. The Extent of E-Procurement Challenges

The mean, standard deviation, and 95% confidence interval on each group factor (ICT-related challenge, Institutional challenge, Employee challenge, and Supplier challenge) rating were further estimated. Based on the output of the study, the ICT factor challenge had the highest mean score of 4.43 [95% CI: 4.15-4.17]. Also, institutional challenge, employee challenge and supplier challenge also obtained the following mean scores 3.90 [95% CI: 3.66-4.15], 3.38 [95% CI: 3.08-3.68], 2.93 [95% CI: 2.59-3.27] respectively.

4.1.1. The test of homogeneity of variance

The test for homogeneity of variance was conducted using Levene's test on the challenges of implementing e-procurement. As shown below in Table 3 the equality of variance test statistic produced 1.33 ($P > 0.05$) which was insignificant revealing that the data is normally distributed.

4.1.2. ANOVA test analysis

The ANOVA test is applied to determine whether or not there is significance in the mean score of the challenges of e-procurement. Based on the output of the table, [F- ratio of 20.062, $P < 0.05$], there is a significant difference across the 4 groups of challenges of e-procurement (ICT challenges, Institutional challenges, Employee challenges, Supplier challenges).

4.1.3. Post hoc test

In the Table 5 the mean score of grouped ICT factors as challenges to e-procurement is significantly different from the grouped institutional factors in the multiple comparison Table 4. Also, the mean score of grouped ICT factors as challenges to e-procurement is significantly different from the grouped employee factors challenges in the multiple comparison table in the *post hoc* test. Additionally, ICT factors are significantly different from the challenges of the supplier factors in the multiple comparison table.

5. DISCUSSION

The one-way analysis of variance was adopted to determine whether there are differences in the mean scores in the challenges of implementing e-procurement and which of the factors identified to contribute significantly to the implementation challenges of electronic procurement systems. In this analysis we looked at which of the following challenges: ICT factor challenges, institutional factor challenges, employee factor challenges and supplier factor challenges affect the implementation of e-procurement in public institutions more than the other factor challenges. Based on the output of the study ICT factor challenges have the highest mean score of 4.43. Institutional challenges, Employee challenges and supplier challenges also obtained the following means score 3.90, 3.38, and 2.93 respectively. Even though ICT challenge has the highest mean score than the other factor challenges in the descriptive table (Table 1). We cannot conclude that because ICT challenge has the highest mean score in (Table 1), it means there is a difference in the mean score within the four-level challenges and that ICT challenge to the adoption of e-procurement is higher than the institutional challenge, employee challenges, and supplier challenge until other tests are performed. The test for homogeneity of variance using the Levene's test is applied to the challenges to determine that the absolute values of the mean and raw score shown are the same for all groups. This indicates a significance value of .267 which is above .05 and therefore indicates a significance in the raw and mean scores for the use of the ANOVA table to determine the statistical significance of the mean score in the challenges to e-procurement implementation. The ANOVA test is applied to determine whether or not there is significance in the

Table 5: Multiple comparison of the challenges of e-procurement

(I) Challenge (J) cha	Mean diff (I-J)	Standard error	Sig	95% confidence interval	
				Lower bound	Upper bound
INST	0.524*	0.205	0.011	0.12	0.93
ICT EMP	1.048*	0.205	0.000	0.64	1.45
SUPP	1.500*	0.205	0.000	1.10	1.90
INST ICT	-0.524*	0.205	0.011	-0.93	-0.12
EMP	0.524*	0.205	0.011	0.12	0.93
SUPP	0.976*	0.205	0.000	0.57	1.38
EMP ICT	-1.048*	0.205	0.011	0.000	-0.64
INST	-0.524*	0.205	0.011	0.011	0.12
SUPP	0.452*	0.205	0.000	0.029	0.86
SUPP ICT	-1.500*	0.205	0.000	-1.90	-1.10
INST	-0.976*	0.205	0.000	-1.38	-0.57
EMP	-0.452*	0.205	0.029	-0.86	-0.05

*P<0.05 Source: Fieldwork 2020

mean score of the challenges of e-procurement in the descriptive table. The interest is in the F' and Sig' columns. Based on the output of the table, it indicates an F- ratio of 20.062 and a significance value of 0.000 which means that there is a significant difference in the mean for the adoption of e-procurement across the challenges of e-procurement- ICT challenges, Institutional challenges, Employee challenges, and Supplier challenges. The challenges of the ICT factors are significantly different from the challenges of the institutional factors in the multiple comparison table. Also, the mean for the challenges for ICT factors is 4.43 and the mean for the challenges for institutional factors is 3.90 in the descriptive table therefore based on the result of the ANOVA table ICT factors are more challenging to the adoption of e-procurement than the institutional factors. Again, the ICT factors are significantly different from the employee factors challenges in the multiple comparison table in the post hoc test. Also, the mean of the challenges of the ICT factors is 4.43 and the mean of the challenges of the employee factors is 3.38 in the descriptive table therefore based on the results of the ANOVA table the ICT factors are more challenging to the adoption of e-procurement than employee factor. The ICT factors are significantly different from the challenges of the supplier factors in the multiple comparison table. This shows a mean challenge for the ICT factor as 4.43 and the mean challenge for the supplier factor as 2.93 in the descriptive table therefore based on the results of the ANOVA table, the ICT factor challenges are more challenging than the supplier factors to the adoption of e-procurement (Refer to Tables 2, 4 and 5).

6. CONCLUSION AND RECOMMENDATIONS

Based on the foregoing analysis, it can therefore be concluded that ICT-related factors are more challenging to the adoption of e-procurement than institutional-related factors, employee-related factors and supplier-related factors. This observation is unique as previous studies, from the literature, have not used this methodology to come out with findings of this nature.

The study recommends therefore that since ICT-related factors are more challenging to the adoption of e-procurement than the other group factors; government must make conscious efforts to develop and prioritize the ICT infrastructure needs of the public institutions.

It should cover all government institutions to ensure the smooth implementation of e-procurement. This will mitigate the wrongful allocation of limited resources. This paper also recommends that there should be an inclusion in the current procurement law through amendment, elements of e-procurement processes to define the processes and procedures of electronic procurement. This will enhance e-procurement implementation and practices in public institutions to promote transparency and equal opportunity to improve economic development in the country.

This study was limited to only the constructs (ICT-related factors, Institutional factors, Employee factors and Supplier factors) and the various indicators under the constructs espoused in this study that affects the implementation of e-procurement in public institutions. We there recommend further studies on other constructs and indicators that impede the adoption of e-procurement.

REFERENCES

- Addo, S.K. (2019), Challenges of E-procurement adoption in the Ghana public sector : A survey of in the ministry of finance. *Scholarly Journal of Arts and Humanities*, 1(7), 44-80.
- Aldenius, M., Khan, J. (2017), Strategic use of green public procurement in the bus sector: Challenges and opportunities. *Journal of Cleaner Production*, 164, 250-257.
- Angeles, R., Nath, R. (2007), Business-to-business e-procurement: Success factors and challenges to implementation. *Supply Chain Management*, 12(2), 104-115.
- Azanlerigu, J.A., Akay, E. (2015), Prospects and challenges of e-procurement in some selected public institutions in Ghana. *European Journal of Business and Management*, 7(29), 61-76.
- Boafo, N.D., Ahudey, E., Darteh, A.O. (2020), Evaluating E-procurement impact in the public sector. *Archives of Business Review*, 8(5), 235-247.
- Brandon-Jones, A., Kauppi, K. (2018), Examining the antecedents of the technology acceptance model within e-procurement. *International Journal of Operations and Production Management*, 38, 22-42.
- Buche, M.W., Davis, L.R., Vician, C. (2012) Does technology acceptance affect e-learning in a non-technology-intensive course? *Journal of Information Systems Education*, 23(1), 41.
- Building, C.I. of. (2010), Procurement in the Construction Industry, A Report Exploring Procurement in the Construction Industry. p6.
- Coase, R.H. (1937), The nature of the firm. *Economica*, 4(16), 386-405.
- Croom, S.R., Brandon-Jones, A. (2016), Key issues in e-procurement :

- Procurement implementation and operation in the public sector. *Journal of Public Procurement*, 5, 367-387.
- Davila, A., Gupta, M., Palmer, R.J. (2002), Moving Procurement Systems to the Internet: The Adoption and Use of E-procurement Technology Models. Stanford GSB Research Paper Series. p1742.
- Davis, F.D. (1989), Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 319-340.
- Aboelmaged, M.G. (2010), Predicting e-procurement adoption in a developing country: An empirical integration of technology acceptance model and theory of planned behaviour. *Industrial Management and Data System*, 110(3), 392-414.
- Gupta, A.K., Gupta, N. (2020), Effect of corporate environmental sustainability on dimensions of firm performance-towards sustainable development: Evidence from India. *Journal of Cleaner Production*, 253, 119948.
- Hamma-Adama, M., Ahmad, A.B.S. (2021), Challenges and opportunities of E-procurement in the construction industry. *Journal of Construction Materials*, 2(4), 4-7.
- Handfield, R.B. (2013), A resource dependence perspective of just-in-time purchasing. *Journal of Operations Management*, vol. 11, 289-311.
- Harrington, H.J. (2011), *Business Process Improvement: The Breakthrough Strategy Total Quality, Productivity and Competitiveness*. New York: McGraw Hill.
- Kalakota, R., Robinson, M., Tapscott, D. (2001), *E-business 2.0: Roadmap for Success*. Boston: Addison-Wesley Professional.
- Kamotho, D.K. (2014), *E-Procurement and Procurement Performance among State Corporations in Kenya*. (Doctoral Dissertation, University of Nairobi).
- Khanapuri, V.B., Nayak, S., Soni, P., Sharma, S., Soni, M. (2011), Framework to Overcome Challenges of Implementation of e-procurement in Indian Context. In: *International Conference on Technology and Business Management*. p28-30.
- Kim, M., Suresh, N.C., Kocabasoglu-Hillmer, C. (2015), A contextual analysis of the impact of strategic sourcing and E-procurement on performance. *Journal of Business and Industrial Marketing*, 30(1), 1-16.
- Krisanthi, G.A.T., Sukarsa, I.M., Bayupati, I.P.A. (2014), Governance audit of application procurement using cobit framework. *Journal of Theoretical and Applied Information Technology*, 59(2), 342-351.
- Kumar, C.V.S., Routroy, S. (2017), Performance analysis of supplier development programs. *Benchmarking: An International Journal*, 24, 488-510.
- Mohungoo, I., Brown, I., Kabanda, S. (2020), A Systematic Review of Implementation Challenges in Public e-Procurement. In: *Conference on e-Business, e-Services and e-Society*. p46-58.
- Nolan, A. (2009), Purchasing's new power. *Director*, 52(7), 46-49.
- Ocloo, C.E., Xuhua, H., Akaba, S., Shi, J., Worwui-Brown, D.K. (2020), The determinant factors of business to business (B2B) e-commerce adoption in small-and medium-sized manufacturing enterprises. *Journal of Global Information Technology Management*, 23(3), 191-216.
- Rajkumar, T.M. (2001), E-procurement: Business and technical issues. *Information Systems Management*, 18(4), 52-60.
- Sambasivan, M., Nandan, T., Mohamed, Z.A. (2009), Consolidation of performance measures in a supply chain environment. *Journal of Enterprise Information Management*, 22, 660-689.
- Sava, N.A., Dragoş, D. (2022), The legal regime of smart contracts in public procurement. *Transylvanian Review of Administrative Sciences*, 2022(66E), 99-112.
- Siricha, P.S., Theuri, F.S. (2016), The effects of electronic procurement on organizational performance in Kenya ports Authority. *Imperial Journal of Interdisciplinary Research*, 19, 5-20.
- Steinberg, R. (2003), *Strategies for Successful Government e-procurement*. United States: Gartner: Research Note.
- Tanner, C., Woelfle, R., Schubert, P., Quade, M. (2008), Current trends and challenges in electronic procurement: An empirical study. *Electronic Markets*, 18(1), 6-18.
- Tavares, L.V. (2011), *Public Etendering in the European Union*. Trust in Evolution. Lisbon: European Vortal Academy.
- Tutu, S.O., Kissi, E., Osei-Tutu, E., Desmond, A. (2019), Evaluating critical factors for the implementation of e-procurement in Ghana. *International Journal of Procurement Management*, 12(1), 1-14.
- Williams, K.B., Williams, J.E. (1980), The assessment of transactional analysis ego states via the adjective checklist. *Journal of Personality Assessment*, 44(2), 120-129.
- Williams, S.P., Hardy, C.A. (2007), E-procurement: Current Issues and Future Challenges. In: *Proceedings of the 15th European Conference on Information Systems, ECIS 2007*. p131-142.
- Yamane, T. (1967), *Elementary Sampling Theory*. New Jersey: Prentice-Hall, Inc.
- Yin, R.K. (2003), Designing case studies. *Qualitative Research Methods*, 5(14), 359-386.

APPENDIX 1

Research Questionnaires

Dear respondent,

This questionnaire is administered to solicit data to conduct research. I assure you that the research data obtained will be used for only academic purposes, and your anonymity and confidentiality of you as a respondent will be guaranteed. Please indicate your response by ticking (✓) to your appropriate response. Thank you

Respondent Demographics

1. Sex: Male Female
2. Age group: 20-29 years 30-39 Years 40-49 Years 50-59 Years
3. Qualification: certificate Diploma First degree Master's PhD
4. Experience: 1-4 years 5-9 years 10-14 years 15- Above
5. Specify the position you occupy.

Challenges to Implementing E-procurement

Based on the reasons below, please select the extent to which you agree or disagree with the challenges of implementing e-procurement. Indicate response by ticking [✓]

Questions	SD	D	n	A	SA
IRF					
Information system cracking and hacking					
Unstable supply of energy					
Unstable internet connectivity					
Incompatibility of technology					
INRF					
Unwilling to re-engineer					
Supplier adoption challenges					
High cost of e-procurement solution					
Issues of accountability and transparency					
ERF					
Lack of professionalism					
Lack of training requirement					
Unavailability of e-procurement experts					
Change in management resistance					
SRF					
Poor location of sources logistics are purchase					
The negative perception of suppliers					
Lack of monitoring of supplier's compliance					
Poor quality of items procured					

SRF: Supplier relationship factors, ERF: Employee-related factors, INRF: Institutional-related factors, IRF: ICT-Related factors