

The Effect of E-Tendering on Performance of Public Hospitals in Kakamega County, Kenya

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Abstract: The performance of public hospitals in Kenya have been marred with a lot of issues ranging from poor services to the patients, delayed supplier payments and constant labour unrest. Complaints have arisen from the manner in which procurement of goods and services are handled leading to inefficiencies in various departments including in the clinical medicine. Patients have been equally suffering in grief due to poor service delivery. Public hospitals have inadequate facilities and are characterized by dilapidated facilities, insufficient drugs, and inadequate human capital as well as obsolete infrastructural facilities. The general objective of the study was to determine the effect of E-Tendering on performance in public hospitals in Kakamega County, Kenya. The study was founded on diffusion of innovation theory. The study applied descriptive survey research design. The study utilized a sample size of 204 which was derived after the calculation from a population of 416 using Yamane 1967 formula. Questionnaire was used to collect data. Validity was determined through discussion with the supervisor and experts in the field while reliability was also determined by pilot study with a focus on internal consistency. This was measured using the Cronbach alpha coefficient. The measures of central tendency and correlational analysis were also used in data analysis. The study found out that E-Tendering had a significant influence on the performance of public hospitals in Kakamega County, Kenya.

Key words: E-Tendering, performance, public hospitals, innovation theory

I. Introduction

In the recent decades, the global procurement process has undergone a two-fold revolution because of the development of information technology and increasing sensitivity of the environmental issues (Tariq 2025). Use of web-based technology in managing procurement activities commonly known as e-procurement has become an important 'strategic' approach in management of supply chain. It assists in improving efficiency, enlarging the effectiveness, lowering the costs, and decreasing the inaccuracies (Emenogu, 2025)

Public procurement in Ghana's public sector has undergone substantial reforms, particularly in response to escalating concerns regarding corruption within procurement processes (Anane et al., 2019). A pivotal reform in this regard was the enactment of the Public Procurement Act, 2003, which marked a significant step towards streamlining procurement activities across all government ministries, departments, and agencies with the overarching goal of enhancing transparency and accountability (Mansaray et al., 2018).

The theory of procurement can be roughly termed as purchasing and supply which is considered to be synonymous to purchasing goods and services to use in organization (Quashie, 2019). Nevertheless, Quashie (2019) argues that procurement is something bigger than acquisition as it refers to the whole internal focus and external procedures of acquiring the goods and services that are required by an organization effective functioning. Procurement in the public sector should relate to strategy and state goals and listing it as such a change and growth device (Mansaray et al., 2018). The procurement process includes the pre-contract phases, contract stages and post-contract phases and compliance (Mansaray et al., 2018).

Public hospitals are the majority health facilities in Kenya and majority of the citizens depend on them for healthcare services. The performance of public hospitals in Kenya have been marred with a lot of issues ranging from poor services to the patients, delayed supplier payments and constant labor unrest. Complaints have arisen from the manner in which procurement of goods and services are handled leading to inefficiencies in various departments including in the clinical medicine. Patients have been equally suffering in grief due to poor service delivery. Public hospitals have inadequate facilities and are characterized by dilapidated facilities, insufficient drugs, inadequate human capital as well as obsolete infrastructural facilities (Oloo et al., 2017). The road to executing successful E-Procurement in developing countries public procurement management is paved with difficulties, such as resistance from the bureaucracies involved; lack of decision making from the top management; lack of motivation; weak human capital; corruption and fraud; and, in the case of conflict-ridden countries, the instability and violence that damage any efficient long-term work. The introduction of integrated financial management information systems (IFMIS) has only helped streamline financial processes which in turn has not had effect on procurement performance. Moreover, ICT systems that anchor the E-Procurement are knotty, expensive, and difficult to manage and maintain (Sollish, & Semanik, 2012). The potential of information technology is realized through its integrated use in the various core and support functions of an organization as well as with external business partners.

According to Mugambi (2019) ICT in procurement significantly influence the success of a company especially the procurement performance. The priority of E-Government is to provide support in the creation of process efficiency and cost/expenditure transparency as well as achieving reductions in the purchasing price. Adjei-Bamfo *et al.*, (2019) alluded that E-procurement makes an important contribution to successfully carrying out the procurement function with much ease. E-Procurement enhances efficiency and effectiveness of the procurement process. An efficient procurement process in the public sector organizations will result in improved performance in public sector organizations (Adjei-Bamfo *et al.*, 2019). A study by Oloo *et al.*, (2017) stated that tendering practices, supplier selection practices as well as ethical consideration practices are the key procurement practices that affect performance of hospitals in Kenya. E-procurement and by and large ICT interacts with procurement to improving quality of services while its absence or use of inappropriate means can act as a barrier to change and may lead to deterioration of the purchasing function. This is achieved through procurement by sourcing for the best goods and services from suppliers at the right price, quantity, quality and delivered at the right time. The use of integrated information systems in procurement have attracted a lot of attention in the recent past.

Procurement performance is a measure of identifying the extent to which the procurement function is able to reach the objectives and goals with minimum costs, there are two main aspects of the procurement performance: effectiveness and efficiency (Nandankar & Sachan, 2020). Procurement effectiveness is the extent to which the previously stated goals and objectives are being met. It refers to the relationship between actual and planned performance of any human activity. Measuring procurement performance is important as the purchasing department plays an ever increasingly important role in the supply chain in an economic downturn (Flynn, 2018). Reduction in the cost of raw material and services can allow companies to competitively market the price of their finished goods in order to win business.

Statement of the problem

E-procurement facilitates streamlining procurement, ensuring prompt service delivery while optimizing resource use (Rotich *et al.*, 2015). Notably, there has been effort by the government especially from the public procurement regulatory authority to streamline procurement functions and improve performance (Rotich & Okello, 2015). Regardless of the effort by the governments of developing countries, like Kenya and development partners like the World Bank and IMF to improve performance of the procurement function, public procurement is still marred by corruption, unfair tendering and poor evaluation of qualification for the tenders (Okello *et al.*, 2021).

The ethics and anti-corruption commission in their 2022 yearly report stated that procurement in the public sector is still marred with a lot of irregularities which need to be looked into since this has affected the performance of the public sector. This has in effect hampered the level of services being offered in the public hospitals thereby making the public who can afford to seek private healthcare services. Facilities in most of the public hospitals are delapidated, insufficient and in some cases lack of proper personnel to handle them. Report from National Treasury (2020) established that the level of E-Government was still down leading to acquisition and implementation of E-government procurement in the budget policy statement for fiscal year 2020-21. This was as a result of numerous reports on corruption, irregularities that were unearthed by the Ethic and Anticorruption Commission (EACC) which adversely affected performance of the public health facilities.

Auditor-general report (2022) on state department for ICT and innovation noted inadequate electronic government in various government agencies. While transparent e-government procurement systems foster accountability, ensuring responsible budget expenditure and service delivery or improving procurement planning and ensuring efficient budget absorption; it still remains an avenue for impropriety in the public sector leading to poor performance (Adjei-Bamfo *et al.*, 2019). Ngeno and Omwenga studied factors that contribute to e-procurement adoption in Bomet County government while Afolabi *et al.*, (2019) in their study in Nigeria about critical factors for e-procurement; Ruzindana and Prashant (2016) studied adoption of e-procurement and how it affects procurement performance among Rwanda's telecommunication companies; while Mahdillou and Akbary (2014) studied e-procurement adoption and the benefits that accrue as well as costs implications.

Consequently, Gichuhi and Waruguru studied e-tendering process and its influence on procurement performance in Geothermal Development Company in Nakuru, Kenya; Masudin, *et al.*, (2021) examined the impact of E-procurement adoption on company performance in Indonesia and Osir (2016) carried a study in Utalii College as a case of state corporation where he assessed the role of e-procurement adoption on procurement performance. To this end, even though studies have been undertaken around e-government procurement in Kenya, there isn't any known study about how it affects procurement performance in public hospitals in Kakamega County, presenting a contextual and geographical gap. By increasing efficiency, reducing costs and improving transparency, e-procurement can help these hospitals deliver better services to the community, ultimately contributing to improved health outcomes. Consequently, it is against this backdrop that the study will determine the effect of E-Government on procurement performance of public hospitals in Kakamega County, Kenya.

II. Research Objective

The main objective of the study was to investigate the effect of E-Tendering on performance in public hospitals in Kakamega County, Kenya.

Research Hypothesis

H₀₁: E-Tendering does not significantly affect performance in public hospitals in Kakamega County, Kenya.

Theoretical Framework

Theoretical framework is defined as a structure that summarizes concepts and theories, which were developed from previously tested and published knowledge which were synthesized to help the researcher have a theoretical background or on the basis for data analysis and interpretation of the meaning contained in the research data (Kivunja 2018).

Diffusion of Innovation Theory

The study was guided by the diffusion of Innovation theory; diffusion is the process by which an innovation is communicated through certain channels over a period of time among the members of a social system. It was founded by Rodgers (1962). An innovation is an idea, practice, or object that is perceived to be new by an individual or other unit of adoption. Communication is a process in which participants create and share information with one another to reach a mutual understanding (Rogers, 2009). The Innovation- Decision Process Model suggests that the adoption of an innovation is not a single act, but a process that occurs over time. Potential adopters go through five stages when interacting with an innovation.

The first stage is knowledge in which potential adopters find out about an innovation and gain a basic understanding of what it is and how it works. The second stage is persuasion in which potential adopters form a positive or negative impression of the innovation. It is only in the third stage decision, that the innovation is actually adopted or rejected. The fourth stage, implementation, occurs when the innovation is actually used. In the fifth stage, confirmation, the adopter seeks information about the innovation and either continues or discontinues use of the innovation. Diffusion theory explains the concept in which firms can successfully adopt ICT in its procurement processes to enhance performance innovatively.

In the context of e-government procurement in public hospitals, diffusion theory could explain how the new procurement system is adopted by different stakeholders such as hospital administrators and procurement officers and the factors that influence the rate of adoption. Understanding the diffusion process can help in identifying barriers to adoption such as lack of technical experts, insufficient infrastructure and can guide strategies to promote the adoption of e-government procurement systems effectively in order to improve performance.

Empirical literature

E-tendering entails information exchange in electronic arrangement that permits the parties involved to get use the same internet-based system, this allows them to save on, money and time and helps in error elimination and reduction on times spent analyzing (Odero, 2014). From an economic perspective, electronic tendering through saving of cost savings during an operation etc. improves efficiency. Other benefits coming with electronic tendering include improved accountability, improved information exchange, reduction of administrative costs (an insubstantial benefit). Platis et al., (2019) carried a study in Greece among the public hospitals where they assessed e-procurement where their main objectives were to determine the level of e-procurement usage as well as the various legal barriers in Greece. The study used primary data collection method and descriptive statistics. The results found out that e-procurement is a useful tool for management of finance in the public hospitals. Throughout the whole process of electronic tendering the responsibilities of the team of finance members are kept hence their efficiency is improved. However, the study failed to determine the influence of e-tendering on the procurement performance of public hospitals.

Al-Bishari and Khali (2021) carried a study in Oman among service provision industry specifically determining the E-tendering efficiency. The study used planned behavior theory and qualitative data collected. The findings showed that e-infrastructure is a good platform for ensuring an effective e-tendering system in the service industry. The study further recommended the need to increase awareness on e-administration among the tender companies, government as well as the general citizens. This study only focused on e-tendering efficiency in the service industry but the current study is assessing the influence that e-tendering has on procurement performance of public hospitals.

Conceptual framework

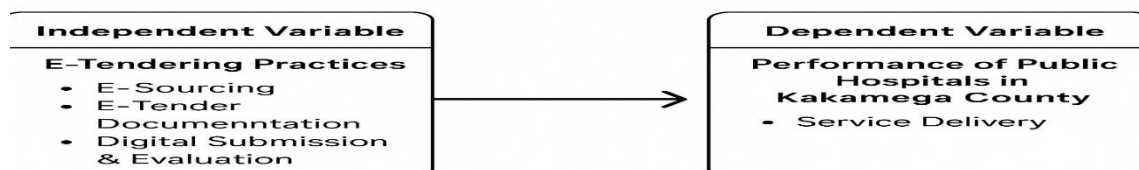


Figure 1

III. Research Methodology

Descriptive survey research design has been chosen because it also involves collecting quantitative and qualitative data in order to answer questions, hypothesis concerning the current status of the subjects of the study (Flick, 2015). The study only targeted public hospitals officers who are involved in procurement or affected by procurement activities. The target population of the study was healthcare workers in Kakamega County which were 416. The study employed stratified random sampling to select the respondents who participated in the study who were 204 officers.

Presentation and Discussion of Findings

Two hundred and four (204) study questionnaires were disseminated to units of observation. Of the 204 surveys disseminated, 179 were retrieved. This yields an 87.75% return rate. The response rate was sufficient and representative for drawing conclusions and extrapolating the research outcomes. This corroborates the assertion by Baruch and Holtom (2008) that a response rate of 50% or above is considered satisfactory in the social sciences. Nulty (2011) asserts that a response rate of 75% is sufficient for analysis, trend inference, and generalizations on a given population.

Descriptive Findings of E-Tendering

Table 1

Statements on E-Tendering	Mean	Std. Dev
Our digital submission and evaluation platform allows for efficient evaluation of bids through features like automated scoring and document sharing.	2.27	.961
Our e-sourcing platforms allow for a wider range of qualified bidders to participate in the tender process.	2.52	.813
Utilizing e-tendering practices has resulted in improved value for money achieved in procured goods and services.	2.93	.752
E-tendering has positively impacted the performance and efficiency of our hospital's procurement process.	3.07	.995
The use of e-sourcing tools helps our hospital to streamline the tender selection process, saving time and resources.	3.42	.821
Our e-sourcing platform provides a secure and reliable method for submitting tender proposals electronically.	3.54	.869
E-tendering has led to increased transparency and reduced corruption in our hospital's tendering process.	3.55	.701
The format of our e-tender documents allows for easy comparison of proposals from different bidders.	3.85	.651
Our e-tender documents are clear, concise, and easily accessible on the e-sourcing platform.	3.99	.821

According to the study, most public hospital digital submission and assessment systems do not permit effective bid evaluation (Mean = 2.27, SD = 0.961). This implies that bid assessment is slow, difficult, and maybe prone to human bias since hospitals lack automated scoring systems and effective document-sharing tools.

Furthermore, e-sourcing systems hinder more general involvement of competent bidders (Mean = 2.52, SD = 0.813). This could suggest that limited prequalification requirements, poor system usability, or accessibility issues in hospitals' e-procurement systems compromise supplier diversity and competition. Moreover, e-tendering has had a neutral effect on procurement performance and efficiency (Mean = 3.07, SD = 0.995) and not clearly affected value for money in procurement (Mean = 2.93, SD = 0.751). This suggests that e-tendering's predicted operational and financial advantages have not been entirely realized. By means of e-sourcing solutions, hospitals have been able to maximize the tender choosing procedure, so saving time and money (Mean = 3.42, SD = 0.821). This implies that although bid review is still difficult, hospitals gain from digital systems that simplify tender management processes, lower documentation, and cut paperwork. Furthermore, offering a safe and dependable way for electronic tender filing is e-sourcing systems (Mean = 3.54, SD = 0.869). A secure system guarantees adherence to procurement policies, lowers the possibility of bid manipulation, and builds supplier and stakeholder confidence. Among the most noteworthy results is that e-tendering has resulted in lower corruption in hospital procurement systems and more openness (Mean = 3.55, SD = 0.701). The e-tender document structure also makes it simple to compare bidder bids (Mean = 3.85, SD = 0.651). Standardized documentation helps to improve impartiality in bid evaluation, hence guiding procurement decisions. On e-sourcing systems, e-tender documents

are clear, succinct, and easily accessible (Mean = 3.99, SD = 0.821), therefore demonstrating that hospitals have improved in ensuring that procurement data is well-structured and simply available to stakeholders.

Correlation Analysis

The study found that e-tendering had a positive, significant, linear relationship with the performance of public hospitals in Kakamega County, with a Pearson correlation coefficient of 0.805 at 0.01 level of significance.

Table 2 Correlation Findings on E-Tendering and Performance

Variables		Performance	E-Tendering
Performance	Pearson Correlation	1	.805**
	Sig. (2-tailed)		.000
	N	179	179
E-Tendering	Pearson Correlation	.805**	1
	Sig. (2-tailed)	.000	
	N	179	179
**. Correlation is significant at the 0.01 level (2-tailed).			

The Pearson Product Moment Correlation was used to determine the strength and direction of the linear relationship between the independent variable (e-tendering) and the dependent variable (performance), and the results are summarized in table 2. The study found that e-tendering had a positive, significant, linear relationship with the performance of public hospitals in Kakamega County, with a Pearson correlation coefficient of 0.805 at 0.01 level of significance.

Regression Analysis, Findings and Discussion of E-Tendering

Table 3: Regression Analysis of E- Tendering

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.805 ^a	.648	.646	.47060	.648	326.132	1	177	.000
a. Predictors: (Constant), E-Tendering									

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.110	.166		.660	.510
	E-Tendering	.955	.053	.805	18.059	.000
a. Dependent Variable: Performance						

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon$$

$$Y = 0.110 + 0.955X_1 + \varepsilon$$

The regression analysis conducted on the relationship between e-tendering and procurement performance in public sector organizations indicates a strong and significant effect. The findings show that e-tendering has a robust positive impact on procurement efficiency, as evidenced by the R value of 0.805, suggesting a strong correlation between e-tendering practices and procurement performance. Additionally, the R-square value of 0.648 means that approximately 64.8% of the variation in procurement performance can be explained by the use of e-tendering. This indicates that e-tendering plays a substantial role in improving procurement functions. The adjusted R-square value of 0.646 further validates the model's strength, showing that the relationship remains strong even after accounting for additional predictors.

The coefficients table reveals that e-tendering has a significant and positive effect on procurement performance. The unstandardized coefficient for e-tendering is 0.955, meaning that with every increase in e-tendering practices, procurement performance improves by approximately 0.955 units. This demonstrates that e-tendering contributes directly to enhancing procurement processes. The standardized beta coefficient of 0.805 indicates that e-tendering is the most influential factor in the model, making it a key driver of procurement performance. Furthermore, the t-value of 18.059 and the p-value of 0.000 confirm that the effect of e-tendering on procurement performance is statistically significant.

In conclusion, the regression analysis clearly shows that e-tendering significantly improves procurement performance, with a substantial proportion of the variation in performance being attributed to its use. The findings highlight the importance of adopting e-tendering as a critical tool for improving procurement efficiency and effectiveness. These results suggest that further efforts to integrate and enhance e-tendering systems could lead to even greater improvements in procurement functions within organizations.

IV. Conclusion

The conclusions from this study on e-tendering and procurement performance have significant policy implications for both public and private sector organizations. The strong positive relationship between e-tendering practices and procurement performance suggests that adopting such systems can greatly enhance the efficiency and transparency of procurement processes. As a result, policymakers should prioritize the implementation of e-tendering solutions across procurement functions, ensuring that resources are allocated for the development and maintenance of these digital platforms.

Additionally, given the significant improvement in procurement performance linked to e-tendering, policies should be crafted to encourage organizations to adopt these systems, including providing incentives for public organizations to transition from traditional to electronic procurement methods. Policymakers should also focus on addressing barriers such as technical challenges and resistance to change by investing in training programs for procurement personnel, ensuring that they are equipped with the skills necessary to fully leverage e-tendering systems.

Furthermore, the findings highlight the importance of integrating e-tendering with broader sustainability goals, such as green procurement, to further improve efficiency while supporting environmental responsibility. Policies that support the inclusion of sustainability criteria in e-tendering platforms could help align procurement functions with global environmental standards, contributing to sustainable development objectives.

V. Recommendations

The study recommends that policymakers consider e-tendering not only as a tool for improving procurement efficiency but also as a means to enhance transparency, reduce corruption, and promote fairness in procurement processes. These policy changes could lead to a more effective and accountable procurement environment, benefiting both the public sector and society at large.

Suggestions for further Research

Future research on e-tendering could explore the integration of digital technologies like blockchain and AI to enhance transparency and sustainability in procurement. Studies could also assess its impact across various sectors, examine the long-term effects on procurement performance, and investigate challenges to its adoption, such as resistance to change and technical barriers. Additionally, research could focus on promoting sustainability within e-tendering platforms, compare adoption rates across countries, and evaluate the user experience to improve system design. These areas would provide deeper insights into optimizing e-tendering for greater efficiency and broader application.

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