

# Practitioners' Perception on Use of E-procurement Practices towards Cost Saving in Public Procurement in Tanzania

<sup>1</sup>Barnabas Maagi and Adam Mwakalobo<sup>2</sup>

<sup>1</sup> Lecturer, Department of Procurement and Supplies Management, College of Business Education

<sup>2</sup> Principal, College of Business Studies and Law (University of Dodoma)

Corresponding Author: barnabasmaagi@yahoo.com

## **Abstract**

*Increased cost in procurement has consequences which can affect an organization and thus lead to inefficiency. The objective of this study was to examine practitioners' perceptions on use of e-procurement practices towards cost saving in public procurement. The study employed explanatory sequential mixed methods which involved both quantitative and qualitative data. Data were collected from respondents by using a structured questionnaire involving a sample size of 290 procurement practitioners who were selected by using simple random sampling technique. In addition, five key informants were used to give detailed information on clarification of quantitative data. Quantitative data were analysed by using a Binary Regression Model to determine if there was significant saving or no saving in cost under e-procurement practices while qualitative data were analysed by using content analysis which presented data in their natural setting based on themes and major concepts. The findings indicate that three variables namely e-requisitioning, e-ordering and e-payment were found statistically significant on enhancing cost saving under e-procurement practices with p-values of 0.000; 0.048 and 0.001 respectively. Therefore, the study concluded that the use of e-procurement practices enhances cost saving in areas of requisitioning, ordering and payments. The study recommends that policy makers should develop better policies on e-procurement that focuses on cost reduction, and public entities should establish cost control programmes with aid of e-procurement technology which keeps an eye on costs incurred to improve efficiency in procurement.*

**Key words:** E-procurement, Cost Saving, Public Procurement

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## **1.0 Introduction**

Scholars in the literature have reported that the use of e-procurement practices has many benefits such as greater transparency, cost saving, time saving, fast communication, improved business processes and better sourcing of suppliers

(Otundo, 2021). This implies that, by using e-procurement, an organization will be able to improve efficiency in procurement including cost reduction as an indicator of assessing performance. Increased costs in procurement have raised attention worldwide. As a result, many countries have been prompted to make several reforms in public procurement including use of e-procurement as a strategy to reduce transaction costs in the procurement process. The increased costs in procurement have got an effect to the economy, for example, most of the studies on transaction costs indicate how stakeholders face the challenges of increased transactional costs which lead to higher costs of construction and less economic efficiency in the procurement process. For example, in the United Kingdom, it was reported that about 57% of the total project value consisted expenses spent in the tendering process (Karlsberg et al., 2016), which shows that cost in procurement is still a problem that affects performance of activities in organizations.

In Tanzania, in particular, increased costs in the public procurement process have been reported as an evil that impedes implementation of procurement plans and budgets. Studies have pointed various procurement costs incurred in the course of conducting bidding activities such as preparation of bidding documents, invitation expenses, Tender Board expenses, communication expenses, bid submission and bid evaluation expenses (URT, 2014). Most of these studies pointed on the consequences on how the parties involved in procurement are facing challenges due to the costs incurred during transaction by the parties i.e. buyer and supplier. These costs lead to higher costs of operation and less economic efficiency in procurement activities hence making public procurement become a critical area whereby e-procurement technology can be used effectively and make significant improvement in efficiency. The benefits of e-procurement have been recognized by different studies; for example, it is reported that the use of e-procurement can enable an organization to reduce costs by 42% due to prevention of paper work (Hawking et al., 2004). Furthermore, Mavidis and Folinas (2022) argue that the use of e-procurement technology connects many vendors that can be accessed through an online tender's portal thus facilitating the buyer to access potential suppliers at minimal costs. Mohd et al. (2017) identified strategic areas where e-procurement can reduce cost and thus increase efficiency in an organization such as ordering costs, administrative costs and opportunity cost of capital. It is in this context that many countries including Tanzania have adopted e-procurement and made it mandatory for the purpose of increasing efficiency in procurement.

Despite the mandatory use of e-procurement and the eager to improve efficiency in the public procurement process, still a little is known on cost saving under use of e-procurement practices in public procurement in Tanzania. Most of the available literature addresses much the challenges that existed in the traditional (manual) system such as high bid evaluation expenses, high tender board expenses, enormous paper work, high cost of bidding documents, high communication expenses, etc. (Tseng et al, 2022). Although many public entities have adopted e-procurement practices, studies are still silent to address perception of practitioners in relation with use of e-procurement practices as a new technology to save costs in the public procurement process. Therefore, this study tries to fill a gap in knowledge by exposing perception of procurement practitioners on effect of e-procurement practices to save costs in public procurement in Tanzania.

## **2. Theoretical Literature Review**

### **2.1 Definition of Terms**

**2.1.1 E-procurement:** is an automated system that enables processing of procurement activities through online. The activities include processing of requisitions, advertisement, bid submission, bid evaluation, etc. (Croom & Jones, 2013).

**2.1.2 Public Procurement:** is a type of procurement undertaken by public entities in acquisition of goods, services and works to meet requirements of their organizations (PPA, 2016).

**2.1.3 E-requisitioning:** is the process of performing requisitioning activities by using an electronic system whereby details of requirements including specifications are prepared online and submitted electronically to the procurement department (Farrington & Lyson, 2016).

**2.1.4 E-sourcing:** is the process of identifying suppliers by using online technology in the marketplace. The system enables the supplier to get tender opportunities through a tender's portal established in the system (Florian et al., 2016).

**2.1.5 E-ordering:** is the processing of purchase orders or contracts by using electronic means so as to form consent between the parties (Farrington & Lyson, 2016).

**2.1.6 E-payment:** means the process of making payments to suppliers by using an electronic system. Under the system, invoices from the supplier will be processed and funds remitted to the supplier's account by online means (Farrington & Lyson, 2016).

## **2.2 Theories Guiding the Study**

### **2.2.1 Transactional Cost Economy**

The Transaction Cost Economy theory (TCE) postulates that when an organization is undertaking a certain business activity there are transaction costs involved in doing such activity or operation. The theory has assumptions that asset specificity, uncertainty, frequency, complexity and contestability are the factors for consideration in minimizing transaction costs in procurement (Williamson, 2010). This means that an organization can differentiate its performance from other organizations by using unique techniques that will be difficult to be imitated by others hence being able to achieve a competitive advantage. For example, with regard to asset specificity, if an organization decides to automate all its procurement functions it means the organization will be very unique in terms of technology as compared to others. This will enable the organization to use such an opportunity to improve efficiency including cost reduction.

### **2.2.2 The Resource-Based Theory (RBT)**

This theory stipulates that the use of resources can enable an organization to get strength and hence be in a position to achieve a competitive advantage over other competing organizations. This means that when an organization has tangible and intangible resources such as assets, machines, materials, manpower, technology, patent rights etc. which are distinct in nature it will enable the organization to get capabilities in performing business operations. The internal resources including e-procurement technology play a significant role in implementation of organizational strategies especially when the resources are distinct from those of other competitors; they add more value by improving business processes thus making an organization achieve its objective (Barney et al., 2011).

### **2.2.3 E-procurement Performance Measurement Model (EPPM)**

This model tries to measure performance of an e-procurement function based on five dimensions namely transparency, competition, efficiency, effectiveness and dematerialization. On transparency, the model highlights the importance of visibility in the e-procurement process as a strategy that ensures openness and fairness to the parties involved in the procurement process. On competition, the model highlights that the use of e-procurement ensures competition by

connecting many potential suppliers across the world which finally enhance economy in pricing of goods and services. With regard to efficiency, the model posits that the use of e-procurement improves efficiency in terms of reducing time and costs in procurement; on effectiveness it highlights that e-procurement enables an organization to perform operations effectively and thus achieve its objectives while. On dematerialization the postulates that e-procurement eliminates paper work and thus reducing unnecessary expenses as compared to the traditional paper-based systems (Gardenal, 2013).

### **2.3 E-procurement Practices and its Benefits**

By starting with e-requisitioning, here the system processes requisitioning activities online whereby the user initiates the process by stating specifications of his requirements and then submit the information electronically to the staff in procurement department who will do sourcing and ordering processes. The manual practice requisitioning process was done by using hard documents known as purchase requisitioning forms which were filled and sent physically to the responsible staff in procurement office. Under e-procurement this is done by submitting the requirements online from the user department to the procurement department hence avoiding costly use of paper work. With regard to e-sourcing, it helps to connect many potential suppliers in the market through an online method which enables the buying organization to minimize documentation expenses (Nandankar & Sachan, 2020). On e-ordering, ordering activities are processed online whereby documents such as procurement order or contract forms are prepared in the computer and sent to the bidder directly under an online system. In this way, the information of the order is communicated to the supplier faster and with minimal cost. Online order processing enhances success in business performance by eliminating unnecessary wastes that occurred during the traditional system such as advertisement cost, communication expenses, stationery and printing expenses (Morufu, 2016). The use of e-ordering can cause a significant influence on improving efficiency in public procurement. On e-payment, the system helps to process payments through an online method thus facilitating timely payments to bidders and in an economical manner. Due to simplicity and security, many countries have preferred e-procurement that enables secured and economical means of payments in an organization as compared to a cash-based system. Therefore, the use of e-procurement which involves automation of organizational activities can reduce costs and thus leading to significant improvement in public procurement. Following the information captured from the literature, the study's hypotheses are as follows:

(H<sub>01</sub>): There is no significant relationship between e-requisitioning and cost saving in public procurement.

(H<sub>a1</sub>): There is significant relationship between e-requisitioning and cost saving in public procurement.

(H<sub>o2</sub>): There is no significant relationship between e-sourcing and cost saving in public procurement.

(H<sub>a2</sub>): There is significant relationship between e-sourcing and cost saving in public procurement.

(H<sub>o3</sub>): There is no significant relationship between e-ordering and cost saving in public procurement.

(H<sub>a3</sub>): There is significant relationship between e-ordering and cost saving in public procurement.

(H<sub>o4</sub>): There is no significant relationship between e-payment and cost saving in public procurement.

(H<sub>a4</sub>): There is significant relationship between e-payment and cost saving in public procurement.

### **3.0 Research Methodology**

This study employed explanatory sequential mixed methods whereby both quantitative and qualitative data were used in phases. This method was preferred because it allows use of narrative data to explain numeric findings especially those that are unexpected (Creswell, 2014). The study adopted simple random sampling technique to get a sample size of 290 procurement practitioners working in public entities who were obtained by using Yamane formula (1967) based on calculation involving the relevant population. Simple random sampling technique was preferred for the reason of ensuring equal chance of respondents and thus avoiding biasness in the study (Kothari, 2014). In this case, the study adopted a drop off and pick up (DOPU) approach to deliver the self-administered questionnaire copies to respondents while a semi-structured interview guide was used during interviews with key informants. These data collection instruments were used in phases whereby quantitative data were collected in the first phase by using a structured questionnaire involving public procurement practitioners.

The obtained data were analysed so as to give clear understanding on perceptions of the practitioners regarding the effect of e-procurement practices on cost saving. Thereafter, in a period of two weeks the researcher returned again in the field to collect qualitative data so as to get more clarifications from Heads of Procurement Management Units regarding issues raised during collection of quantitative data. In order to ensure measurement of the variables, the questionnaire on independent variables was scaled using a 5-point Likert scale (1 = Very high cost; 2 = High cost; 3 = Medium cost; 4 = Low cost; and 5 = Very low cost) while on the part of the dependent variable the questionnaire had Yes

and No optional responses. Data were analysed by using Binary Logistic Regression Model. The model was preferred because it is appropriate in analysing categorical data as appeared in this study in which the dependent variable had two alternative responses Yes and No (Yin, 2014). The qualitative data collected from key informants were analysed by using content analysis. At the end, data were computed with aid of IBM Statistical Package for Social Sciences (SPSS) which produced output results that enabled the researcher to determine if there was significant cost saving under using e-procurement practices.

The formula of Binary Regression Model was represented as follows:

$$\log_e \frac{p}{1-p} = \beta_0 + \beta_1x_1 + \beta_2x_2 + \beta_3x_3 + \beta_4x_4 + \varepsilon$$

Where:

$\beta_0$  = Constant,

$\beta_1, \beta_2, \beta_3, \beta_4$  = Regression coefficients

$x_1$ =E-requisitioning,  $x_2$ =E-sourcing,  $x_3$  =E-ordering,  $x_4$  =E-payment

$\varepsilon$  = Estimated error.

In order to ensure reliability of data, Cronbach’s alpha was computed to examine internal consistency of the research instruments. The Cronbach’s alpha values range from 0 to 1, and the values above 0.7 represent an acceptable level of internal reliability (Lawson, 2014). The Cronbach’s alpha value for this study in Table 1 was 0.752, which indicates a high level of internal consistency for the items used.

**Table 1: Cronbach’s Alpha Values**

Items	Number of items	Cronbach’s Alpha
Cost saving	5	0.752

**Source: Field Data, 2019**

## **4.0 Findings and Discussion**

### **4.1 Results of the Binary Logistic Regression**

This section gives results on the effect of using e-procurement practices on cost saving by using the Binary Regression Model. The assumptions of the model were checked to determine validity of the information used regarding use of e-procurement practices and cost saving in procurement as indicated below.

#### **4.1.1 Testing of Outliers**

In order to determine normal distribution of the data that were collected, the study used normalized residual test which was run in the IBM SPSS Statistics software. In the literature, it is recommended that normalized residual values ranging between -3 and 3 are acceptable to justify validity of data under using regression model (Anderson, 1982). The results in this study indicated that all normalized residual values were within the range of -3 and 3 which implies fitness of the data in the model.

#### **4.1.2 Multi Co-linearity Testing**

In this study, multicollinearity was tested by using standard error (SE) whereby the results in Table 2 show that standard error was below 2.0 which indicates that there was no multi collinearity hence making the data become valid under using regression model.

#### **4.1.3 Testing of Goodness of-fit**

In order to ensure that the used data fitted the model, the study used Hosmer and Lemeshow test whereby the results in Table 2 indicate that the p-value was 0.246 (not significant) which implies a good fit of data in the regression model. In the literature, it is argued that a p-value above 0.05 shows a good fit of data thus ensuring validity of the data (Pallant, 2011).

### **4.2 Results on Cost Reduction**

This section presents the results of the regression model whereby data of the independent variables (e-requisitioning, e-sourcing, e-ordering and e-payment) were regressed on cost saving as a dependent variable so as to determine if there was any significant cost saving under using the e-procurement practices. Table 2 indicates the results of the regression model.

**Table 2: Effect of E-procurement Practices on Cost Saving**

	B	S.E.	Wald	Sig.	Exp(B)
E-payment	1.457	.434	11.295	.001*	4.294
E-ordering	1.312	.691	3.604	.048*	3.714
E-sourcing	1.313	.720	3.324	.068	3.716
E-requisitioning	1.866	.531	12.365	.000*	6.460
Constant	-17.717	4.345	16.629	.000	.000
Chi-square		39.218(p=000)*			
Hosmer and Lemeshow		9.087(p=0.246)			
Cox & Snell R Square		.126			
Nagelkerke R Square		.413			
-2 Log likelihood		66.918			

\*Denotes significant level at 5%

$$\log_e(p/1-p) = -17.717 + 1.457(\text{E-payment}) + 1.312(\text{E-ordering}) + 1.313(\text{E-sourcing}) + 1.866(\text{E-requisitioning})$$

**Source:** Field Data, 2019

This study aimed at assessing perceptions of procurement practitioners in relation to effect of using e-procurement practices to save cost in the public procurement process a using binary regression model. Table 2 gives results of the binary regression model whereby contribution of each variable is presented after running the data in the IBM SPSS software. To start with, the results indicate that, generally, the model was statistically significant (p = 000), implying that the model was appropriate to estimate the effect of e-procurement practices on cost saving in public procurement. The Table also presents additional information including R-Square, Cox and Snell and Nagelkerke R square which portray fitness of data in the model. The results indicate that the Cox and Snell R square was 0.126 which means that the variable explained a total variance of 12.6% in the model. Furthermore, the results show that the Nagelkerke R square value was 0.413 which means that the variable explained a total variance of 41.3% in the model. Other factors which explain the remaining per cent of variation in costs were not included in this study. Table 2 also indicates beta coefficients and significant values for each variable with regard to use of e-procurement to save cost in procurement. Starting with e-requisitioning, the results show that the beta coefficient was positive (1.866) and significant (p = 0.000) with an odds ratio of 6.46, which means that the likelihood of the variable to reduce costs in the procurement process was 6.5 times more likely. Following significant relationship of the variable, the relevant alternative hypothesis was accepted in the sense that the use of online submission of requisitions from user department to Procurement department plays a significant role in reducing costs in

procurement. In the traditional system, the requisitioning process was associated with enormous paper work such as purchase requisition forms that were prepared and submitted to procurement department to show details of specifications. With regard to e-sourcing, the results in Table 2 show that the beta coefficient value was positive (1.313) and significant ( $p$ -value = 0.068) with an odds ratio of 3.716 which indicates that the likelihood of this variable to save cost in the public procurement process was 3.7 times more likely. In other words, the results show that when using electronic technology to identify suppliers it enables the buyer to prevent unnecessary costs and improve efficiency as compared to the traditional system. The supplier solicitation stage involves a lot of communication between the client and the supplier; for example; the client needs to prepare bidding documents including invitation to bidders so that bidders can get informed on the available procurement opportunities from the client. Automating the sourcing activities enables the buyer to interact with many bidders across the world who are connected to the internet thus reducing unnecessary searching expenses of suppliers. On e-ordering, the results in Table 2 indicate that the beta coefficient value was positive (1.312) and significant ( $p$  = 0.048) with an odds ratio of 3.714 which means that the likelihood of e-ordering to save costs in public procurement was 3.7 times more likely.

Following the results, the relevant alternative hypothesis was accepted in the view that online submission of purchase order documents to suppliers reduces costs in procurement significantly. Under the traditional system the ordering stage was one of the areas that consumed resources to a large extent; for example, in some public entities there were tenders that involved preparation of many contracts between the procuring entity and the contractor. Such contracts necessitated use of paper work that was to be signed by the contracting parties, and also the process involved physical interactions whereby the contractor was subjected to travel to the client's office for contract signing. This means that such a manual practice caused unnecessary costs to both buyers and the contractors. On e-payment, the results revealed that the beta coefficient value was positive (1.457) and significant ( $p$  = 0.001) with an odds ratio of 4.294, which shows that the likelihood of e-payment to save costs in public procurement was 4.3 times more likely. In this case, the relevant alternative hypothesis was accepted in the sense that online payment of suppliers enhances cost saving in the procurement process. The use of e-payment enables funds to be transferred directly to the account of the payee thus avoiding the risk of theft in moving with cash money or cheques as it sometimes happened in the traditional system. Also, making e-payment ensures paperless in doing payment activities hence enhancing economy in the organization.

Based on the results obtained in this study it is observed that three out of four independent variables of e-procurement were found significant in reducing costs in the public procurement process which means that e-procurement practices are very crucial in elimination of unnecessary costs and thus enabling procuring entities to improve efficiency in public procurement. In support of these quantitative results, key informants had the following similar opinion:

“...In our entity, the e-procurement system has reduced costs in areas such as buying stationery items, bid advertisement and Tender Board expenses...”

Under manual practices, procurement involved long procedures that contributed to transaction costs such as higher searching cost for suppliers, transport costs and tendering costs. This shows that, from the practice point of view, public institutions in Tanzania have faced many challenges in the procurement process. For example, CAG (2018) reported that delays in procurement of medical supplies for hospital use had caused death of patients due to absence of needed materials. A similar problem of delay in procurement was reported by Mgani (2014) who argues that late delivery of goods from suppliers is a challenge that still affects many organizations in procurement. In addition, corruption in public procurement, particularly in energy and construction sectors, was reported as a major challenge in public procurement in Tanzania (TI, 2019). In support of the results, an interviewee as a key informant said:

“...E-procurement has prevented many non-value adding activities in our organization which led to unnecessary costs in procurement such as advertisement in newspapers and use of paper-based documents like Requisitioning forma, Purchase Order and Payment Vouchers ...”

The above quotations indicate that, after using e-procurement, most of the challenges that existed in the traditional system have been prevented due to automation of procurement activities done online. Also, e-procurement has reduced labour cost because only a few staff are needed to perform the activities (Lyson & Farrington, 2016). The results concur with the Transaction Cost Theory which postulates that transactional costs can be reduced by automating the procurement processes. Similarly, Hawking et al. (2004) argue that organizations that use e-procurement practices can save costs by 42% in the procurement process. This implies that organizations that use e-procurement will prevent unnecessary costs that contributed to inefficiency in procurement during the traditional manual system. In other words, it can be concluded that the use of e-procurement has a significant role in enabling procurement practitioners or managers to improve their operations and hence being in a position to achieve

their organizational objectives. For example, under the traditional system activities such as requisitioning, solicitation of bidders, ordering, tender evaluation and payments were sources of inefficiency in many organizations because these activities demanded use of papers (URT, 2014). These costs can have significant effects in the procurement process by overwhelming the budget of the organization thus leading to cancellation of some planned projects (Hu et al., 2019). These explanations are in line with the Transaction Cost Economy Theory which posits that there are costs incurred in the course of searching suppliers, negotiation and making contract and that if these costs are not managed properly, they can bring unhealthy procurement operations and cripple growth of the organization (Budget Office, 2019; Shahab & Lades, 2021).

With transaction cost analysis, emphasis could be placed on developing formal contracts, rules and regulations, and suitable strategies, such as use of e-procurement technology (Yuan et al, 2019). Therefore, procuring entities should pay more attention to use of e-procurement, particularly in documentation of requisitioning, ordering and payment activities so as to minimize the costs in undertaking the bidding process in public procurement. In doing so, it would be possible to eliminate unnecessary costs incurred during processing of tenders in procurement. In order to achieve effective cost saving in procurement, the use of e-procurement practices should be fully utilized with accuracy, conformance to standards and complete information communication between the parties as this will minimize waste during the procurement process (Shahab et al., 2019). This needs to explore the possibility of automating public procurement systems such as preparation of bid documents, invitation, submission of bidding documents, evaluation and awarding of tenders with a view to reduce procurement cycle time, reduce administrative costs and improve service delivery in the organization. The online sharing of information on public procurement among the stakeholders enhances visibility, transparency and economy as compared to the traditional procurement system which posed many challenges in procurement (URT, 2014). These explanations are in line with the Resource Based View Theory which contends that the use of e-procurement is a resource that can enable an organization to achieve competitive advantage as compared to other organizations which don't use it. Based on the results from the study and the reviewed theoretical literature, it is observed that the use of e-procurement practices enhances efficiency, particularly in reducing costs in procurement hence becoming a resourceful tool that can help procurement practitioners excel in performing business activities as well as achieving organizational objectives.

## 5.0 Conclusion

The study examined practitioners' perception on effect of e-procurement practices on cost saving in public procurement and concludes that three variables namely e-requisitioning, e-ordering and e-payment have significant relationship with cost saving using e-procurement practices. Saving is realized particularly in areas such as submission of requirements from user departments to procurement department, submission of purchase orders online to suppliers and settlement of payments to suppliers.

## 6.0 Implications of the Study

Policy makers in government should develop better policies, rules and regulations on e-procurement that focus on cost reduction in the public procurement process. This should be done by developing strict policy and rules that force all public procuring entities to use the established e-procurement system.

Procuring entities should establish cost control programmes with aid of e-procurement technology that will enable them to keep focus on critical areas of costs in their organizations. This should be done by using appropriate computer software programmes which are relevant in cost accounting which has the capacity to analyse costs and alert users on cost trends in their organizations.

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