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FACTORS INFLUENCING E-PROCUREMENT IMPLEMENTATION IN PUBLIC SECTOR IN SOUTH SUDAN

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ABSTRACT

Implementation of e-procurement systems remains a key enabler of successful execution of procurement functions in any public sector. In most developing countries, governments' initiatives of e-procurement in the public sector are still in their infancy stages. The purpose of this study was to establish the effect of costs on the implementation of electronic procurement in the public sector of South Sudan. The study was guided by the transaction cost theory. The study adopted a descriptive research design specifically a case study which is best in describing and bringing out the elements of the different variables being assessed. Since the target population was small the study was a census survey where all the 128 administration staff of the Ministry of Health was used in the study. This study used questionnaires to collect primary data. The study used a pilot study to ensure reliability and validity of the research instrument. Data analysis for this study was done using descriptive and inferential statistical. Quantitative data collected by using a questionnaire was analyzed by the use of descriptive statistics using the Statistical Package for Social Sciences (SPSS) version 21. Inferential statistics such as regression analysis was used to make inferences from the data. The data was presented through percentages, means, standard deviations and frequencies in graphical and tabular manner. The study found that cost affects the implementation of electronic procurement. The adoption of e-procurement is a costly venture that requires enormous amounts of capital. The government should put much consideration on e-procurement in its budget.

Key Words; *Costs,* E*lectronic Procurement*

INTRODUCTION

In the recent past, there has been a significant effort in the public sector to improve public procurement strategies and procedures. These efforts have mainly focused on realizing improved efficiency and cost-savings through the public sector purchasing system, by developing a number of instruments and tools which assist public sector bodies in their procurement activities. Among these instruments, electronic procurement has come out as a popular system that has been adopted by organizations to achieve these objectives (McCue & Roman, 2012).

E-procurement refers to making use of information, communication and technology (ICT) when carrying out the procurement process from the first stage a need arises to the final stage of post-purchase review. These stages include sourcing, negotiating, placing orders, receiving and reviewing the whole purchase process (Brandon & Carey, 2011). E-Procurement stems from the word e-commerce which refers to carrying out a transaction electronically preferably via the internet. E-procurement is, therefore, a solution of e-commerce that strives to make the whole procurement process from the purchaser to the supplier and back again facilitative, integrated and efficient flow.

With the emergence of Information and Communication Technology (ICT), organizations have been forced to shift their operation from the traditional style to e-business, e-procurement and e-supply chain philosophy in order to sustain themselves (Lee *et al.*, 2014). In the automation of the supply chain process, e-procurement provides several advantages which every organization should consider adopting. E-procurement is seen as a powerful means of achieving efficiency and has an indirect effect on cash savings by providing the access to good deals. E-procurement helps suppliers in tendering for contracts by erasing spatial and distance constraints, by speeding up procedures and by reducing administration costs significantly (Bowersox *et al.*, 2013).

Public sector e-procurement is a complex socio-technical system embedded in multiple layers of government. It has the capacity to become a meaningful agent of transformation in procurement practices through the joint actions of different layers of government and cooperation across diverse agencies. In addition to inter-agency cooperation, cooperation between government agencies and technology service providers is crucial when implementing systems. Collaboration between buyers, suppliers and support staff is equally important, and users should be approached in a coordinated manner to understand how they may shape the system for their own purposes. E-procurement is also a strategic decision, and therefore, a good business design is vital (Dza *at al.*, 2013).

E-procurement in the context of the public sector is part of the economy and used by the government in delivering services to its citizens. E-procurement system is supplier and buyer based on the presence of software. Benefits that arise from the e-procurement are transparency, process efficiency, cost reduction, paperless environment, new supplier discovery and a streamlined procurement process. According to Pereraand Heaney (2011), public procurement is the major instrument in aiding and efficient management of public resources. Public procurement is increasingly becoming recognized as it is a major factor in the effective management of public funds as part of a long-term plan in meeting the procurement needs.

Institutions are investing in information systems - electronic data interchange (EDI), enterprise resource planning (ERP), e-procurement and inter-organization systems, to enhance communication with stakeholders (Laudon *et al*, 2002). The adoption of e-procurement systems would assist governments to improve transparency and efficiency, reduce cost, enhance better decision-making, improve supplier performance monitoring, and quality of services to customers (Neupane *et al*, 2012)

Forrester (2001 – 2003) of the Institute of Supply Management in the United States, quarterly assessed e-procurement between January 2001 and the third Quarter of 2003 by interviewing up to 700 of those involved in the purchase of goods and services. This has identified a number of benefits or drivers for e-procurement and maps the progress of usage within that country. Others like Minahan & Degan (2001), based in Boston USA, carried out case studies, looking at goods and services procurement.

In Australia, the initial implementation of e-tendering took place 20 years ago at a time of government restraint and budget cuts. The introduction of an e-tendering business model in partnership with the private sector allowed the government to outsource the manual and

electronic distribution of bid documents and removed the need to maintain various supplier source lists as all suppliers could now access all procurement information from the website and participate in any tender they chose. The result was an open and transparent procurement environment supported through user fees at no cost to government (Choudary, 2013).

Procurement reforms in Africa have to some extent brought modernity, transparency, competition, as well as fairness in the procurement process. Indeed, the implementation of procurement reforms in Africa has been fraught with cultural insensitivity, the disregard for countries' political, socio-economic, ethical, and environmental structures and systems. The result is the lack of interest and political will to confront the challenges of the reform leading to haphazard and lackluster approach towards its implementation (Hunja, 2003).

In Tanzania, the adoption of e-procurement is a new phenomenon although some initiatives have already been undertaken by few private companies especially owned by foreign investors in large part. Public procurement is still lagging behind as the initiatives slowly progressing and most things are done manually through following the traditional procurement. Most suppliers are not well capable of being integrated into the e-procurement in terms of competent personnel and technological wellbeing (Barua & Konana, 2011).

Mohamed, (2013) had explained that manual procurement system is considered inadequate for construction industry due to lack of transparency in various stages of construction procumbent such as tender evaluation and award. The Manual procurement system is full of tedious paperwork leading to wastage of time and money. Research (Towards E-procurement implementation in Tanzania: construction industry preparedness) has found out that low adoption of E-procurement in Tanzania construction industry is mainly due to of lacks policies & frameworks and low level of awareness of E-procurement to stakeholders. Model for E-procurement adoption for Tanzania construction industry has explained three stages for E-procurement adoption, first policy framework stage, second technology, people and process stage and finally efficiency and transparency stage.

According to Kamel (2014), electronic procurement is destined to play an increasingly significant role in the way procurement in South Sudan is conducted in the future. e-procurement has become the key to valuable data for better, more intelligent management. This system provides a mechanism too quickly and effectively link department operations and suppliers and also provides data analysis functionality that allows operators to monitor costs, consumption rates, inventory tracking, pricing and menu planning to increase efficiency in the public-sector departments. Kamel (2014) in his study to investigate the challenges facing adoption of E-procurement in the Ministry of Finance and Economic Planning, opines that availability of finance, high costs, lack of skilled IT personnel were some of the challenges to adoption of E-procurement in South Sudan.

Statement of the Problem

In today's business world, one important way of enhancing electronic purchasing functions is to benefit from electronic marketplaces and electronic purchasing (Johnson, 2011). This creates a need to clarify the factors influencing implementation of an e-procurement system. By paying attention to both, benefits and problems, it is possible to ensure a successful implementation of an e-procurement system.

Governments in mature economies are adopting e-procurement extensively as it provides structure, audit trails and transparency of transactions. In developing countries, governments' initiatives of e-procurement in the public sector are still in their infancy stages. According to Kamel, (2014), the implementation of electronic procurement in the public sector in South Sudan is inefficient.

Murathi (2016) study to determine the Success of User adoption of e-procurement in Kenyan government ministries found that there was a moderate adoption of the e-procurement processes in government ministries. Orina (2013) study focused on the readiness of the public

sector in Kenya on e-procurement and established that staff embracing change, lack of relevant knowledge on e-procurement, and existing policies impacted on e-procurement. Njeru (2015) investigated the factors affecting effective implementation of Procurement Practices in tertiary public training institutions in Kenya and found that professional training and use of ICT based systems hampered effective implementation of procurement practices in over 80% of tertiary public training institutions.

There is no statistical data to show the cost of implementing the e-procurement system in South Sudan, however, implementing and operating an e-procurement system is costly, the government of Kenya having initiated Integrated Financial Management Information Systems (IFMIS) had by 2013 spend USD 5.6 million (equivalent) and a planned additional cost of USD 5.9 million by 2018 in re-engineering, (GOK, 2016).

In order to mitigate the lack of transparency and accountability in public finance management system, it was recommended that provision of technical assistance and institutional capacity development was key, (AfDB, 2012). The South Sudan Procurement Assessment Report (2016) stated efforts were being made to train procurement staff, about 200 public servants in South Sudan have been trained on e-government systems; the target is to train government executives at all levels.

South Sudan passed into to law the public procurement and disposal bill, this is a key reform on spending (WB, 2017). According to South Sudan Procurement Assessment Report (2016), there are challenges to the authority of the current legal framework for South Sudan's procurement system, which is based on the Interim Public Procurement and Disposal Regulations (IPPDR) of 2006.

The information Communication Technology for Development conference (ICT4D) held in in 2015, identified levels of uptake by government institutions in service delivery, human and technical capacity as the gaps. The limited use of IT was due to low penetration rate of personal computers, computer illiteracy, and limited broadband infrastructure, (UNESCO, 2015). Further, the ICT business operating environment is weak with only 97 business registered, this translates to 1.3% of registered business in South Sudan, (AfDB, 2013).

Despite the evident increase of electronic procurement and benefits of its implementation, limited research has been undertaken to investigate the factors that influence e-procurement implementation in public sector in South Sudan. It's against this background that the study sought to establish the factors influencing e-procurement implementation in public sector in South Sudan.

Objectives of the Study

The general objective was to establish the effect of costs on the implementation of electronic procurement in the public sector of South Sudan.

LITERATURE REVIEW

Transaction Cost Theory (TCT)

Transaction Cost Theory was first developed by Ronald Coase in 1937. Transaction costs occur in the exchange between client and vendor. TCT refers to the idea of the cost of providing for some good or service if it was purchased in the marketplace rather than from within the firm (Lysons & Farrington, 2006). He asserts that transaction costs are comprised of the costs of seeking the suppliers, inspection of goods and establishing and formalizing the terms of an agreement, including the means to both guarantee compliance with the terms and protect against the potential expropriation of the investments made, to ensure that contract conditions are fulfilled.

Transaction Cost Theory explains why firms exist in the first place (to minimize transaction costs), how firms define their boundaries, and how they ought to govern operations (Daddi *et al*., 2010). The theory also helps to determine the efficiency in producing goods and services at low cost to ensure low prices to customers (Lozano & Valles, 2013).

According to Espino-Rodríguez and Padrón-Robaina (2006) the greater the transaction costs, that is the greater the costs that information, negotiation, and supervision of compliance entail, the less the tendency to outsource the activity. Walker and Brammer, (2009) addressed the importance of transaction costs in organizations when analyzing bidding process. Parties have to bid for the right quality of goods and services and the award has to go to the bidder offering the lowest price. Walker and Brammer, (2009) however argue that the problems associated with contracting solutions in the types of environments encountered in manufacturing sector transactions are likely to be difficult to tackle.

This theory is critical in guiding this study as it explains how the ministry ought to govern operations and define their boundaries for the purposes of minimizing transaction costs. In this case, the theory may explain why the institution adopts electronic procurement systems. Empirical evidence shows that e-procurement ensures low cost, good quality, improved productivity, flexibility, and quick response. This theory informs the first objective of the influence of implementation cost the implementation of electronic procurement in the ministry of health.

Conceptual Framework

A conceptual framework is a logical way of expressing a particular attribute in a subject (Mugenda & Mugenda, 2008). A dependent variable is the variable of primary interest to the study. An independent variable is the one that influences the dependent variable in either a positive or negative way. The independent variable is cost and the dependent variable is the implementation of electronic procurement.

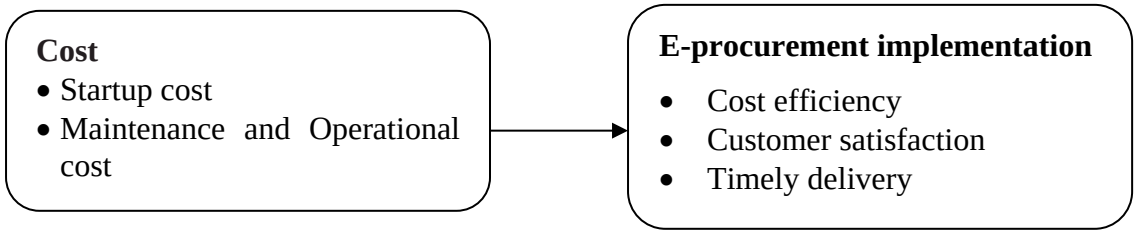

Figure 1: Conceptual framework

Cost of implementation

E-procurement is commonly recognized in bigger than smaller organizations. This is because of the costs involved in the implementation of e-procurement system, in terms of startup, and maintenance. The operations of the organization often determine whether e-procurement is needed or not.

E-Procurement is an Internet technology solution facilitating corporate buying using the Internet. Four major e-procurement Internet-based ICT tools are identified (Davila *et al*, 2013). First, e-procurement software refers to any internet-based software application (traditional EDI e-procurement systems have also migrated to the Internet) that enables employees to purchase goods from approved electronic catalogs in accordance with the company buying rules and captures necessary purchasing data in the process. To achieve that, the software uses protocols to automatically route and move through the necessary approval processes all employees' purchase selections of goods found on a supplier catalog. Internet market exchanges are called the e-procurement systems that bring together multiple buyers and sellers in one central virtual market space and enable them to buy/sell from each other at a dynamic price, thus for the organization to achieve the e-procurement objectives, there is urgent need to invest in the software and the cost of internet connectivity and usage.

Angele and Nath (2017) identified software immaturity and the lack of certain key features like invoicing, payment reconciliation or managing of different geographical jurisdictions, tax

structures, currencies, and fluctuating exchange rates. Institutions need to be aware of the possible hidden costs related to the implementation of e-procurement solutions, such as system integration, content aggregation, and rationalization, catalog and search engine maintenance, supplier enablement, end-user training, and procurement process re-engineering. These costs can extremely exceed software licensing and maintenance cost.

Implementation cost and implementation of e-procurement

Sanewu (2017) investigated the factors influencing implementation of e-procurement on small and medium sizes business in Voi town. The study had three objectives: To ascertain the effect of skills on the implementation of e-procurement in SMEs; to establish the effect of Supplier compatibility on the implementation of E-procurement in SMEs and finally determine the effect of the cost of systems infrastructure on implementation of E-procurement in SMEs. The study adopted a descriptive approach. It targeted a population of one hundred employees. The study used the stratified random sampling technique since the target population was divided into homogeneous subgroups. The study used descriptive statistical techniques including a summary of findings in form of charts, tables, and graphs from coded numbers and percentages; finally, the data was then analyzed using SPSS model. The study found that 49.5% of the respondents influenced the use of e-procurement. It is evident that most of them noted that training of suppliers greatly influenced the use of e-procurement. The study concluded that skills, supplier compatibility and the cost of systems infrastructure influence the implementation of E-procurement in the SMEs in Voi town.

Owili(2013) examined e-procurement implementation and transaction cost among the Non-governmental organizations in Kenya. More specifically, it sought to know the effect of e-procurement implementation on transaction costs in the NGO world. A survey was employed where the respondents were selected from the different NGOs. A sample size of 100 NGOs was selected from a population of 7,083 registered by the government of Kenya. The response rate was 97%.

The respondents were randomly selected. Both qualitative and quantitative methods of data analysis were used. Descriptive statistics and regression analysis were employed to find out the relationships between the variables of interest. The findings of the study indicated that implementation of e-procurement had an impact on the transaction cost. It reduces the various costs of the procurement process and therefore NGOs are encouraged to adopt e-procurement in order to experience these reduced transaction costs.

Obat (2016) conducted a study on the Critical Success Factors in the Implementation of E-Procurement in Public Entities in Kisumu County, Kenya**.** The study assumed a descriptive research design. The target population was composed of procurement professionals in public entities in Kisumu County. The study found that cost of establishment of e-procurement tools, allocation of adequate resources on e-procurement, top management support towards e-procurement implementation, early supplier involvement during e-procurement implementation and reliable in internet service provider were critical when rolling out the e-procurement system in public entities. The study identified the factors that act as prerequisites to the implementation of e-procurement; change management programs for users on e-procurement, supplier involvement, and availability of a reliable internet service provider.

RESEARCH METHODOLOGY

The study adopted a descriptive research design specifically a case study which is best in describing and bringing out the elements of the different variables being assessed. The study population was the public sector of the Republic of South Sudan and the target population was the staff in the administration section of the Ministry of Health. The study however, was a census survey where all the 128 administration staff was used in the study. This was in accordance to Israel (2011) who recommends that when a population is less than 200 a census survey should be conducted. This study used questionnaires to collect primary data.

Data analysis for this study was done using descriptive and inferential statistical. Quantitative data collected by using a questionnaire was analyzed by the use of descriptive statistics using the Statistical Package for Social Sciences (SPSS) version 21 and presented through percentages, means, standard deviations and frequencies in graphical and tabular manner. Regression analysis was used to make inferences from the data.

FINDINGS AND DISCUSSIONS

Response rate

The study was conducted in a sample population of 128 staff in the administration section of the Ministry of Health in South Sudan. The response rate was 81.2% as 104 respondents out of 128 were responsive. According to Babbie (2004), a response rate of 50% is adequate, 60% is good and 70% and above is very good. This response rate (81.2%) is therefore considered very good and adequate for the analysis.

Descriptive statistics Results

Effect of costs on the implementation of electronic procurement

The respondents were requested to indicate their levels of agreement with the statements relating to the effect of cost on the implementation of electronic procurement provided in table 1.

Table 1: Effect of costs on the implementation of electronic procurement

Statements	Mean	Standard Deviation
Sufficient funds have been set aside for complete implementation of e-procurement	1.94	0.263
The organization devotes sufficient funds towards implementation of e-procurement	2.10	0.228
Adoption of e-procurement is a costly venture that requires enormous amounts of capital	4.24	0.290
There is urgent need to invest in the software and the cost of internet connectivity and usage	4.05	0.246
The maintenance cost for e-procurement implementation is high	3.81	0.220
The Ministry has acquired all necessary hardware and software to facilitate e-procurement	2.26	0.207

The respondents agreed on the statements that adoption of e-procurement is a costly venture that requires enormous amounts of capital as shown by a mean of 4.24, that there is urgent need to invest in the software and the cost of internet connectivity and usage as shown by a mean of 4.05 and that the maintenance cost for e-procurement implementation is high shown by a mean of 3.81.

The respondents disagreed on the statement that; sufficient funds have been set aside for complete implementation of e-procurement as shown by a mean of 1.94, the organization devotes sufficient funds towards implementation of e-procurement as shown by a mean of 2.10 and that the Ministry has acquired all necessary hardware and software to facilitate e-procurement as shown by a mean of 2.26.

The respondents further stipulated that cost affect the implementation of electronic procurement in the ministry of health through costs of updates of e-procurement systems, time allocated to implementing e-procurement, costs of allocating for expertise, system testing takes longer than required hence increasing costs. The findings are consistent to those of Sanewu (2017) who also found that the cost of systems infrastructure influences the implementation of E-procurement. Similarly a study by Obat (2016) established that the cost of establishment of e-procurement tools, allocation of adequate resources on e-procurement significantly influence the implementation of e-procurement.

Regression Analysis

Table 2: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1.000	.623a	0.388	0.353	0.6514

a Predictors: (Constant), cost

Adjusted R squared is coefficient of determination which tells us the variation in the dependent variable due to changes in the independent variable. From the findings in the model summary table, the value of adjusted R squared was 0.353 indicating that there was variation of 35.3 percent on implementation of e-procurement due to changes in cost. This shows that 62.3 percent changes in implementation of e-procurement could be accounted to cost.

Table 3: Analysis of variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1.000	Regression	8.113	1	8.113	18.565	.000[b]
	Residual	44.574	102	0.437		
	Total	52.687	103			

a Dependent Variable: implementation of e-procurement

b Predictors: (Constant), cost

From the ANOVA statistics in table above, the processed data, which is the population parameters, had a significance level of 0.000 which shows that the data is ideal for making a conclusion on the population's parameter as the value of significance (p-value) is less than 5%. It also indicates that the model was statistically significant.

Regression coefficients

The combined relative influence of the in dependent variables on implementation of e-procurement was examined using multiple linear regression and the results are presented in Table 4.

Table 4: Regression coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.152	0.272		4.235	.000
Cost	-0.643	0.174	-0.618	-3.695	.006

From the regression equation above it was found that having cost to a constant zero, implementation of e-procurement would be 1.152. A unit increase in cost would lead to a decrease in implementation of e-procurement by 0.643 units.

Conclusions

In conclusion cost affects the implementation of electronic procurement. The adoption of e-procurement is a costly venture that requires enormous amounts of capital. Such costs include costs of updates of e-procurement systems, time allocated to implementing e-procurement, costs of allocating for expertise and the system testing takes longer than required hence increasing costs.

Recommendations

The study revealed that there is a significant influence of cost on the implementation of e-procurement. There is therefore the need for the government to set adequate funds for complete implementation of e-procurement. The government should put much consideration on e-procurement in its budget.

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