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EFFECT OF ELECTRONIC PROCUREMENT TECHNICAL SUPPORT STAFF ON PROCUREMENT PERFORMANCE IN ENERGY SECTOR STATE CORPORATIONS IN KENYA

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Abstract

Purpose: The general objective of this study was to investigate the effect of electronic procurement technical support staff on procurement performance in the energy sector state corporations in Kenya.

Methodology: The study adopted an exploratory approach using descriptive survey design and correlational design. The target population comprised 360 procurement staff and 25 electronic procurement technical support staff from 9 Energy Sector state corporations in Kenya. The sample size consisted of 211 respondents who included procurement and electronic procurement technical support staff. Simple random sampling and census techniques were used in the study. The key data collection instrument used in the study was the questionnaire. Qualitative data were analysed using content analysis while quantitative data was analysed with the help of SPSS widow. Multiple regression was used to test whether the independent variables have any effect on procurement performance.

Results: The study findings indicated that electronic procurement technical support staff contributes positively to procurement performance. Based on the findings, it can be concluded that Electronic procurement technical support staff was found to have the strongest effect on procurement performance. The electronic procurement technical support staffs have the required technical knowledge to deliver products and services that support procurement processes. They were also able to quickly respond to ICT related technicalities.

Unique Contribution to Theory, Practice and Policy: The study recommended that organizations that require to improve their procurement performance through use of ICT must invest heavily in their technical support staff.

Keywords: *Electronic Procurement, Technical Support Staff, State Corporations and Procurement Performance*

1.0 INTRODUCTION

Governments of both developed and developing countries have embraced ICT to improve the quality of public service, increase public access to information and to energize more participation in civic affairs. Most developed countries have realized the importance of the ICT adoption in procurement practices as a way of improving service delivery and effective supply chain performance. Kabaj (2010) contends that an efficient public procurement system is vital to the advancement of African countries economies and is a concrete expression of their national commitment to making the best possible use of public resources. United Nations Conference on Trade and Development (2008) reported that successful ICT adoption in purchasing of goods and services in firms results in savings up to 30 % and reduction in transaction costs up to 25%.

Adoption of ICT in procurement processes allows more efficient integration of supply chains and provides better organization and tracking of transaction records for easier data acquisition (Ogot, 2009). With online transaction, procurement processes can be approved online and the order fulfilled within minutes; where the required item often arrives in real time (Lewis & Roehrich, 2009). Ordinary procurement processes include receiving quotes, prequalification of suppliers, issuing tenders, negotiation with suppliers, award of contracts, receipt of supplies and evaluation of tenders which are all linked by information (lysons & Farrington, 2012). Procurement literature has emphasized the potential contribution of ICT in lowering transaction costs, the prices paid for goods and services, promotion of shorter product- development cycles in addition to enhancing integration in procurement (Mishra et al., 2007; Zsidisin & Ellram, 2001; Croom, 2000). With the use of ICT, these activities have been simplified and speeded up greatly. Nowadays, there is increasing emphasis on the use of ICT to substitute or enhance transactional activities to gain operating efficiencies (Essig & Arnold, 2007).

Global Perspective of ICT on procurement performance

According to a study on e-procurement and supply chain performance in China, e-procurement systems facilitate information flow between the enterprise and its suppliers (Chang, Tsai & Hsu, 2013). Information sharing improves relationships among enterprises. In China, studies have revealed that ICT infrastructure plays a significant role in the application of ICT in schools. The study concluded that construction of multimedia classrooms could significantly increase the utilization rates of ICT in schools. For the benefits of ICT to be realized, students should be trained on how to use the new technologies (Chun, Chin-Chung & Wu, 2015). According to a study by Fuchs *et al.*, (2018) on the role of IT in automotive supply chains, IT functional capabilities have the greatest impact on internal process excellence which in turn enhances supplier performance which may result in improved supply chain performance. The study examined the relationship between IT capabilities, supply chain capabilities and supplier performance. Data were collected from 343 automotive suppliers in Europe. The study also found that frequent and adequate information sharing also contributes significantly to supplier performance. Electronic procurement in UK Public sector was found to reduce maverick spending, increase supply availability, improved communication and better negotiation. The extent to which internal users are provided with support in using the new technology has significant effect on maverick buying. Reduction in the total cost of acquiring goods and services

was realized due to decreased costs of processing purchase requisitions which resulted from improvements made on the procurement system (Croom & Brandon-Jones, 2007).

Other studies on ICT adoption in the UK concluded that acquisition of skills through training resulted in rapid adoption of ICT (Hwang, Yen & Cheng, 2004). A study carried out in the Irish public, Lee (2010) found that fundamental changes are required in the public sector procurement environment to achieve the benefits of the ICT adoption in procurement. Lee, also found that the key issues can be grouped into the following areas: procurement framework and practices, organizational arrangement, electronic procurement technology framework, and the legal and economic environment. Among these issues, a strong and efficient organizational aspect can be realized as a very critical success factor for efficient adoption of ICT in procurement process.

Regional Perspective of ICT on procurement performance

In Uganda, a study carried out by Kakwezi and Nyeko (2010) argued that the procurement departments of public entities in Uganda are faced with the problem of not having reliable information about the procurement procedure, its inputs, outputs, resource consumption and results, and are therefore unable to determine their efficiency and effectiveness. The study concludes that, ICT when adopted in these public entities can provide the decision-makers in the procurement department with unbiased and objective information regarding the performance of the procurement function. In Tanzania, adoption and use of electronic procurement is faced by challenges in the following areas; policy and legislative framework, institutional structures, procurement processes, ICTs and people (Sijaona, 2010).

Other studies, Suleiman (2015) indicate that although Tanzania recognizes the benefits it can reap from implementing electronic procurement, it lacks the necessary legal frameworks, technical infrastructure and procedures to fully implement electronic procurement. A few studies on ICT adoption in Rwanda exist. Ruzindana and Kalaskar (2016) in their study on adoption of electronic procurement and its impact on the Procurement Performance of Selected Telecommunication Companies in Rwanda found that to improve adoption level at employee's level, the organizations in Ruanda must work on factors related to perceived risks associated with internet connectivity. Ensuring that the staff are properly trained on the new technologies and that they understand and comply with the security requirements such as proper use of passwords will enhance the staff confidence level in the use of ICT.

Local Perspective of ICT on Procurement Performance

In Kenya, the government has recognized the importance of adoption of ICT in enhancing service delivery. According to the E-government Strategy Paper 2004, ICT adoption in procurement was one of the medium term objectives which were supposed to be implemented by June 2007 (GoK, 2010). Further, PPOA Interim Report (2009) outlined plans to introduce ICT adoption in procurement process in all Kenya's public entities. The government through the Ministry of Finance has also initiated an e- procurement project whose aim is to have e-procurement system implemented in a few selected ministries before full roll out to other government departments (Rok, 2014).

A number of private organizations in Kenya have successfully adopted the use of e-procurement technology. Gitahi (2011) cited the example of Nation Media Group which through their digital platform commonly known as N-Soko has enabled their clients to purchase products online. A study by Mwangi and Mburu (2015) on effect of ICT on procurement performance in star rated hotels in Kenya revealed that the use of ICT has dramatically transformed the service delivery in

these hotels. Evidence has accumulated to suggest that there is a slow uptake of the technology despite the benefits that ICT adoption in procurement offers (Segal & Taylor, 2001). In Kenya, the factors associated with slow adoption include limited legislation, poor infrastructure, lack of awareness and top management support, integration with internal systems or solutions, lack of technical standards, lack of cooperation on the part of suppliers, and costs associated with adapting web-enabled purchasing system (Malela, 2010). A study by Mutunga, Nyanamba and Okibo (2013) on the effect of e-procurement on public hospitals, a case of Kisii level 5 hospital, indicated that some of the challenges faced included inadequate funding, organizational inability to handle change and lack of training of employees on how to use the system.

Energy Sector in Kenya

Energy is one of the infrastructural enablers of the three "pillars" of Vision 2030 (RoK, 2007). The energy sector comprises of three main sub-sectors namely; the electricity subsector, petroleum subsector and Renewable energy sub-sector. Following adoption of the Sessional Paper No 4 on Energy in 2004 and the enactment of the Energy Act No. 12 of 2006, the energy sector has been restructured over the years to include more players. The Ministry of Energy (MoE) is responsible for policy and overall guidance of the sector while the Energy Regulatory Commission (ERC) oversees all regulatory functions including coordination of the development of indicative energy planning, tariff setting and oversight, monitoring and enforcement of sector regulations. The Energy Sector has nine (9) State Corporations or Parastatals namely Rural Electrification Authority (REA); Geothermal Development Company (GDC); Kenya Power & Lighting Company Limited (KPLC); Kenya Electricity Generating Company (KENGEN); Kenya Electricity Transmission Company (KETRACO); Kenya Nuclear Electricity Board (KNEB); National Oil Corporation (NOCK); Kenya Petroleum Refineries Ltd (KPC); and Kenya Pipe Line Ltd (KPRL) (MoE, 2015). Energy sector is one of the infrastructure enablers of economic pillars in vision 2030 (RoK, 2013). Procurement accounts for the biggest expenditure in the energy sector. About 45% of Kenya national Ministries Departments and Agencies budget for the year 2014/15 was used to directly procure works, goods and services (Ochieng & Muele, 2014). Improving procurement performance will lead to great savings in addition to better service delivery (Maurice, 2014). The procurement functions in the energy sector have been ineffective and inefficient characterized by massive corruption (Cherop, 2016). Studies indicate that some of the factors that affect procurement performance in the energy sector include contract management, Planning, resource allocation, staff competency (kiage, 2013). Procurement in the energy sector state corporations is governed by public procurement and disposal act 2015(PPDA, 2015) which replaced PPAD 2005. The Kenya's energy sector faces various challenges such as the high cost of energy which is one of the biggest bottlenecks to economic activity in the country (KIPPRA, 2005), over-dependence on hydropower with its vulnerability to variations in hydrology and climate, high cost of rural electrification projects, outdated refinery and pipeline system, inadequate storage infrastructure for strategic reserves of the petroleum products, volatility of international crude oil prices and weak legal and regulatory framework for energy resources exploration, exploitation and development (RoK, 2015). Statistics indicate that the cost of electricity in Kenya is four times that of South Africa and three times that of China (KIPPRA, 2005). Other challenges include relatively high petroleum prices compared to other East African countries, frequent electricity interruptions and failures, among others.

Statement of the Problem

The adoption of ICT has been presumed to enhance the efficiency of procurement process, promote openness, increase accountability, eliminate corruption and increase competitiveness in the use of public money, thereby easing the cost of doing business (Rok, 2014). Studies (Bertot et al., 2010; Kim et al., 2009; Croom & Bradon-Jones, 2007; Ndou, 2004; Subramaniam, Qualls & Shaw, 2003) show that organizations that have adopted ICT have been able to reduce total cost of acquisition, enhance customer-supplier relationships, promote better service delivery, increase transparency and accountability, improve records management, reduce errors and purchasing outside of standard procurement processes thus increasing the effectiveness and efficiency of organizations. Local studies (Mutunga, Nyanamba & Okibo, 2013; Mutangili, 2014) concluded that adoption of ICT results in reduced sourcing time and increased information analysis capabilities. The procurement performance in the local scenes of Kenya has been ineffective. This is evidenced by the numerous issues such as poor record keeping, high costs, delays, corruption, political interference and lack of transparency in these processes (Amaeba et al., 2015; RoK, 2014). A report presented by EACC (2015) showed that more than 50% of the government officials who had corruption issues related to procurement were from the energy sector. Cherop (2016) further advances that unethical behaviors in the energy sector procurement department have been revealed. Due to these challenges, poor quality goods are procured, tender awards made to unsuccessful bidders, value for money not obtained and huge amounts of resources which could be used to improve the economy and consequently the lives of Kenyans goes to waste. This shows that there are indeed loop-holes in the procurement departments in the energy sector which needs to be addressed appropriately.

It may be noted that procurement accounts for the biggest expenditure in the energy sector (RoK, 2014). According to the office of national statistics in UK, Energy sector contributes 3.3% of GDP, 18.1% of total investments and directly creates approximately 6.2% of industrial employment thus making the energy sector a major contributor to the economy. Data from *OECD National Accounts Statistics* indicate that in 2011, on average, general government procurement spending represented 29% of total general government expenditures or 13% of GDP (OECD, 2013). In Kenya, although statistics are not available, the sessional paper on vision 2030, puts Energy as one of the infrastructural enablers of the three "pillars" of Vision 2030 (Rok, 2014). At any rate, there is need to examine the effect that ICT has on the procurement performance in the energy sector of which this forms a key objective of this study. In terms of literature, there are numerous studies (Lu, Tsai & Wu, 2015; Mwangi & Mburu, 2015; Abass & Okibo, 2014; Mutunga, Nyanamba & Okibo, 2013; Chang, Tsai & Hsu, 2013; Nchunge, Sakwa & Mwangi, 2013; Croom & Brandon-Jones, 2007) which have been done on the impact that ICT has on procurement. For instance, the study by Abass and Okibo (2014) show that ineffective procurement processes in the public sector hinder implementation of strategies as per vision 2030 thus making the realization of the contribution of energy sector to the economy unachievable. Additionally, the study by Chimwani, Iravo and Tirimba (2014) attributes the poor performance of procurement to non-adoption of ICT. However several studies (Nchunge, Sakwa & Mwangi, 2013; Lu, Tsai & Wu, 2015) which attribute inefficiency in Procurement to lack of adoption of ICT fail to explain how adoption of ICT aids the procurement performance. Moreover, these studies have had their own limitations relating to geographical coverage, methodology and scope. Hence, this study was prompted to examine the effect of electronic

procurement technical support staff on procurement performance in the energy sector state corporations in Kenya.

Research Hypothesis

H_{01}: Electronic procurement technical support staff have a significant positive effect on procurement performance in energy sector state corporations in Kenya.

2.0 LITERATURE REVIEW

Theoretical Review

Resource Based View Theory

The Resource Based View Theory focuses on a firm's resources and capabilities as determinants of competitive advantage and performance. This theory was introduced by Wernerfelt (1984) whose study concluded that the competitive advantage of a firm is based on its resources and its ability to exploit them. It further explains that these resources are embedded in the organisations business processes (Ray *et al*., 2004). Assets and strengths such as information or organizational processes are some of the firms resources which if strategically managed would result in competitive advantage (Barney, 1991). The assets can be both tangible (physical) and intangible such as intellectual property, brand reputation. The theory assumes that these resources are heterogeneous (they differ from one company to another e.g. skills and capabilities) and immobile (they do not move from company to company at least in the short run). Based on this theory, the effective and efficient use of a firm's internal resources can lead to sustainable competitive advantage (Kraaijenbrink, Spender, & Groen, 2010). When ICT is embedded in specific organizational processes such as procurement, benefits such as cost savings, elimination of paper and delays can be achieved. Processing transactions online through the use of ICT can lead to increased transparency but also exposes the organization to competitive threats (Loh & Venkatraman, 1992).

Further, the synergistic benefits achieved through an integrated system provide the sources of sustained competitive advantage for a firm (Bharadwaj, 2000). This theory supports the variable electronic procurement technical support staff since they can have unique skills and capabilities which if effectively and efficiently used can lead to outstanding improvement in procurement performance. The unique skills and capabilities of these staff can be a source of competitive advantage. The importance of the synergistic effect of the existence of the other variables can also not be ignored. Proper management of electronic procurement technical support staff alone, may not improve the performance of procurement function in an organization, it may need to be combined with the other factors such as information technology, proper electronic procurement policies among other factors. Likewise, ICT alone may not lead to the required improvement in procurement, it may require other distinctive capabilities of an organization.

Conceptual Framework

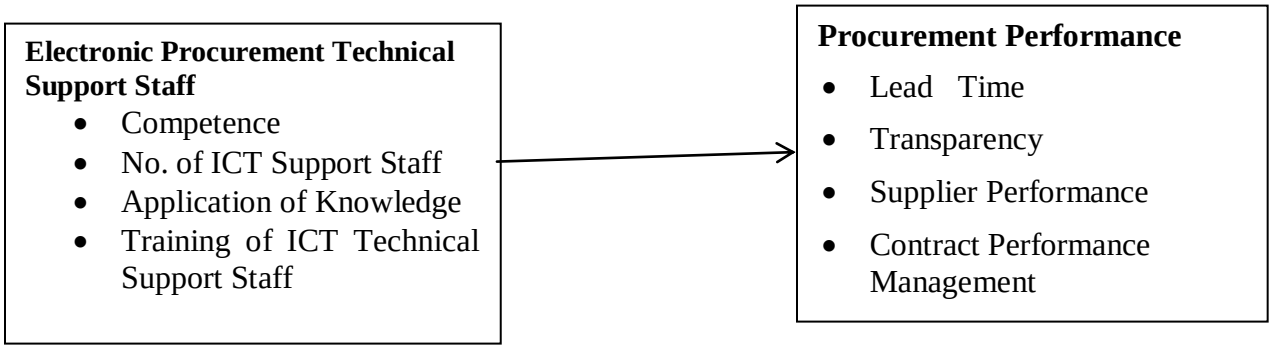

Figure 1: Conceptual Framework

Empirical Review

Electronic Procurement Technical Support Staff

Armstrong (2000) pointed out that staff support on ICT is the formal and systematic modification of behavior through learning which occurs as a result of education instruction development and planned experience. The fundamental aim of training is to help the organization achieve its purpose by adding value to its key resources, the people it employs. Staff support means investing in people to enable them to make the best use of their natural abilities. The objectives of support staff are to develop the skills and competence of employees and improve their performance, help people to grow within the organization in order that as far as possible in new job as appointment transfer or promote and ensure that they become fully competent as quickly and economically as possible. Effective staff support can minimize learning costs, improve individual, terms and co-operate performance in terms of output, quality speed and overall productivity. To improve operational flexibility by extending the shape of skills possessed by employees (multi-skilling) increases the commitment of employees by encouraging them to identify with the mission and objectives of the organization and to provide high level of services to customer. Mutula and Brakel (2007) studied ICT skills readiness in Botswana concluded that there is a serious skills gap for ICT support staff especially certified developers of the application softwares in the developing countries. Using a qualitative design, data was collected from focus group discussions consisting of key stake holders from the ICT sector. The study further revealed that the level of ICT usage was high since ICT was their tool of work. Department of Enterprise, Trade and Employment (Ireland) (2005) in Ireland revealed that Low levels of ICT usage was found to have resulted in failure of Europe to catch up with productivity growth rates of the USA. Studies show that high levels of ICT usage lead to increased productivity in organisations.

A study done by Arvanitis, Loukis and Vasiliki (2013) on the effect of soft capital on innovation performance ICT Personnel showed that ICT Training and Users have a positive impact of both process and product innovation. Further, the total effect of these three types of soft capital on innovation performance was found to be stronger than that of hard ICT capital. This study used data collected through a survey based on a structured questionnaire administered to 271 Greek

firms. The study suggests that organisations should consider both soft and hard capital in order to optimize ICT related investment. Comparing the present ICT supported procurement, traditional procurement was paper-based and conversation-based (Bartezzaghi & Ronchi, 2003). Currently, this has changed to some extent and procurement has become a strategic function: procurement personnel look for suppliers that fit within a company's overall plan and strategy. If the ICT adoption in procurement system does not have the full support of the top management team, there is every reason for it to fail. It is important to make sure that the top management has given full support for the adoption of e-procurement. Considerable attention and support should be provided by senior management to ensure that the procurement reform has been well understood in the agency.

Top management support, firm size, skills and knowledge and organization policy are considered to be factors that influence firms' willingness to adopt electronic procurement. Jeyaraj *et al.*, (2009) found that top management support to be one of the best predictors of organizational adoption of IS innovations. Top management can stimulate change by communicating and reinforcing values through an articulated vision for the organization. Top management support is critical for creating a supportive climate for the adoption of new technologies by ensuring that there is adequate budget allocation for training electronic procurement technical support staff. According to Chatterjee (2006), top managers nowadays continuously emphasize adoption of Internet applications; they often advise employees to be sensitive to competitors' initiatives with regard to e-business; top managers insist that their employees must bring more of their business practices online in order to meet customers' future needs; they are willing to try to provide the necessary resources for implementing e-business practices; they often advise employees to keep track of the latest developments in Internet technology and Internet related business practices, and incorporating e-business practices in company. The emphasis of top managers on e-business would facilitate performance gains from e-business adoption. Procurement Managers and internal stakeholders can easily drive user adoption and system compliance through significant change management efforts and ongoing education of those utilizing ICT for various functions. This is because of the interactions made by suppliers and businesses who they supply to and those that manufacture or supply to them.

3.0 RESEARCH METHODOLOGY

The study adopted an exploratory approach using a descriptive survey design and correlational design. The study further adopted a positivism philosophy where scientific processes were followed in hypothesizing fundamental laws then deducing the observations so as to determine the truth or falsify the said hypotheses. The target population comprised 360 procurement staff and 25 electronic procurement technical support staff from 9 Energy Sector state corporations in Kenya. The sample size consisted of 211 respondents who included procurement and electronic procurement technical support staff. The study adopted questionnaires to collect both quantitative and qualitative data. Qualitative data were analysed using content analysis while quantitative data was analysed with the help of SPSS window to generate descriptive statistics such as percentages, frequency tables, means, and standard deviations. The study was guided by the following regression model:

$$\mathbf{Y = \beta o + \beta_1 X_1 + \varepsilon}$$

Where: Y= Procurement Performance,X_1= Electronic Procurement Technical Support Staff, βo = Constant of Regression and ε = Error term. Diagnostic tests were conducted to ensure adherence to assumptions of ordinary least square regression model.

4.0 RESULTS

4.1 Descriptive Results

4.1.1 Electronic Procurement Technical Support Staff

The study sought to establish the effect of electronic procurement technical support staff on procurement performance. Respondents were requested to indicate their agreement levels with statements on electronic procurement technical support in a scale of 1-5. The results presented in table 1 shows that respondents strongly agreed with the statement that their technical support staff have the necessary technical knowledge to deliver products & services that support procurement (mean=5 and standard deviation=0), that the technical support staff are able to communicate, understand the needs of our procurement Users (mean=5 and standard deviation=0), that their support staff are trained regularly to keep up with changing technology(mean=5 and standard deviation=0) and that training materials are customized for specific jobs by our support staff and provided to users (mean=5 and standard deviation=0). Respondents agreed that the technical support staff are able to analyse problems in electronic procurement systems and provide solutions(mean=4 and standard deviation=1), that their technical support staff respond promptly when they have ICT related technicalities(mean=4 and standard deviation=1), that they have a virtual/development system where the support staff can run transactions before running them in the live system (mean=4 and standard deviation=1) and that the support staff regularly receive & implement feedback from users thus ensuring continued use of the system (mean=4 and standard deviation=1). Respondents further agreed that support staff constantly check and maintain the system to ensure confidentiality and data integrity (mean=4 and standard deviation=1), that manual procedures have been blocked to ensure that Staff utilize ICT Knowledge (mean=4 and standard deviation=1) and that their organization has an e-learning tool for training ICT (mean=4 and standard deviation=1). The results corroborate with Hamada (2012) findings which stated that lack of ICT technical support among management was one of the factors influencing the use and success of information communication technology on procurement process.

Table 1: Electronic Procurement Technical Support Staff

Statements	Mean	Std. Dev
Our technical support staff have the necessary technical knowledge to deliver products & services that support procurement	5	0
The technical support staff are able to analyse problems in electronic procurement systems and provide solutions	4	1
The technical support staff are able to communicate, understand the needs of our procurement Users	5	1
Our technical support staff respond promptly when we have ICT related technicalities	4	1
We have a virtual/development system where the support staff can run transactions before running them in the live system	4	1
The support staff regularly receive & implement feedback from users thus ensuring continued use of the system	4	1
Support staff constantly check and maintain the system to ensure confidentiality and data integrity	4	1
Manual procedures have been blocked to ensure that Staff utilize ICT Knowledge	4	1
Our organization has an e-learning tool for training ICT	4	1
Our support staff are trained regularly to keep up with changing technology	5	1
Training materials are customized for specific jobs by our support staff and provided to users	5	1

4.1.2 Procurement Performance

Respondents were requested to indicate their agreement levels with statements on procurement performance in a scale of 1-5. The results presented in table 2 shows that respondents strongly agreed with statements that purchase orders/contracts are sent electronically to Suppliers resulting in reduced contract award lead time (mean=5 and standard deviation=1), that their suppliers deliver goods/services on time (mean=5 and standard deviation=1) and that with the adoption of electronic procurement technical support staff in procurement department, off contract buying has been reduced (mean=5 and standard deviation=1). Respondents agreed with the statements that sourcing time has been reduced considerably with the implementation of electronic procurement technical support staff (mean=4 and standard deviation=1), that adoption of electronic procurement technical support staff has reduced re-entering data from paper documents consequently reducing errors/time taken to prepare purchase orders/contracts (mean=4 and standard deviation=1), that bidders are able to electronically view the tender opening process (mean=4 and standard deviation=1) and that clear & comprehensive bidding documents are published in standard form and made available in the website/portal (mean=4 and standard deviation=1). Additionally, respondents agreed that the outcome of the tendering process(winning bidder, price, ranking) is available online (mean=4 and standard deviation=1), that their organisation publishes contract award notices in the portal/website(mean=4 and standard deviation=1), that their suppliers offer products that consistently conform to their specifications and that their suppliers are willing to change goods/services to meet the changing customer needs (mean=4 and standard deviation=1). Further, respondents agreed that their suppliers have enough flexibility to respond to unexpected demand changes (mean=4 and standard deviation=1), that with the use of electronic procurement technical support staff

contracts are created using predefined templates thus reducing contract document creation time (mean=4 and standard deviation=1), that contract deadlines and notifications are electronically monitored (mean=4 and standard deviation=1), that key performance indicators for the contracts are tracked electronically (mean=4 and standard deviation=1) and that circulation of Contracts documents is done electronically thus reducing paperwork (mean=4 and standard deviation=1). In a summary, the findings in this section show that the procurement performance has improved to some extent through the adoption of electronic procurement technical support staff . Some of the areas that have improved include transparency, reduced lead times, increased efficiency. This concurs with Gordon (2009) who indicated that introduction of electronic procurement technical support staff is expected to enhance the status and influence of the procurement function within organizations.

Table 2: Procurement Performance

Statements	Mean	Std. Dev
Sourcing time has been reduced considerably with the implementation of electronic procurement technical support staff	4	1
Adoption of electronic procurement technical support staff has reduced re-entering data from paper documents consequently reducing errors/time taken to prepare purchase orders/contracts	4	0
Purchase orders/contracts are sent electronically to Suppliers resulting in reduced contract award lead time.	5	1
Annual procurement plans are published on the websiteF	4	1
Bidders are able to electronically view the tender opening process	4	1
Clear & comprehensive bidding documents are published in standard form and made available in the website/portal	4	1
The outcome of the tendering process(winning bidder, price, ranking) is available online	4	1
Our organisation publishes contract award notices in the portal/website	4	1
Our suppliers deliver goods/services on time	5	1
Our suppliers offer products that consistently conform to our specifications	4	1
Our suppliers are willing to change goods/services to meet the changing customer needs	4	1
Our suppliers have enough flexibility to respond to unexpected demand changes	4	1
With the use of electronic procurement technical support staff Contracts are created using predefined templates thus reducing contract document creation time	4	1
Contract deadlines and notifications are electronically monitored	4	1
Key performance indicators for the contracts are tracked electronically	4	
Circulation of Contracts documents is done electronically thus reducing paperwork	4	1
With the adoption of electronic procurement technical support STAFF in procurement department, off contract buying has been reduced	5	1

4.2 Inferential Analysis

Inferential uses statistical tests to determine the existence and the strength of the relationship between the independent and the dependent variable. Inferential statistics are used to make inferences about the larger population based on the sample. These statistics actually determine how one variable compares to another (Joppe, 2000). The study used correlation and regression statistical tests. Before performing inferential statistics, the distribution of the data was determined.

4.2.1 Correlation Analysis

Correlation analysis tests the direction and relationship between variables. Correlation tests look for an association between variables. The study used scatter plots to illustrate the degree of correlation between the variables.

4.2.1.1 Scatter Plot between Electronic Procurement Technical Support Staff and Procurement Performance

To determine the effect of electronic technical support staff on procurement performance correlation analysis was used. The scatter plot (appendix iii) shows that there is a positive correlation or relationship between electronic procurement technical support staff and procurement performance. Since the scatter plots lie close together, it means that there is a strong correlation between electronic procurement technical support staff and procurement performance. The results indicate that electronic technical support staff are a significant positive predictor of procurement performance and therefore energy sector state corporations should ensure that they enhance communication technology.

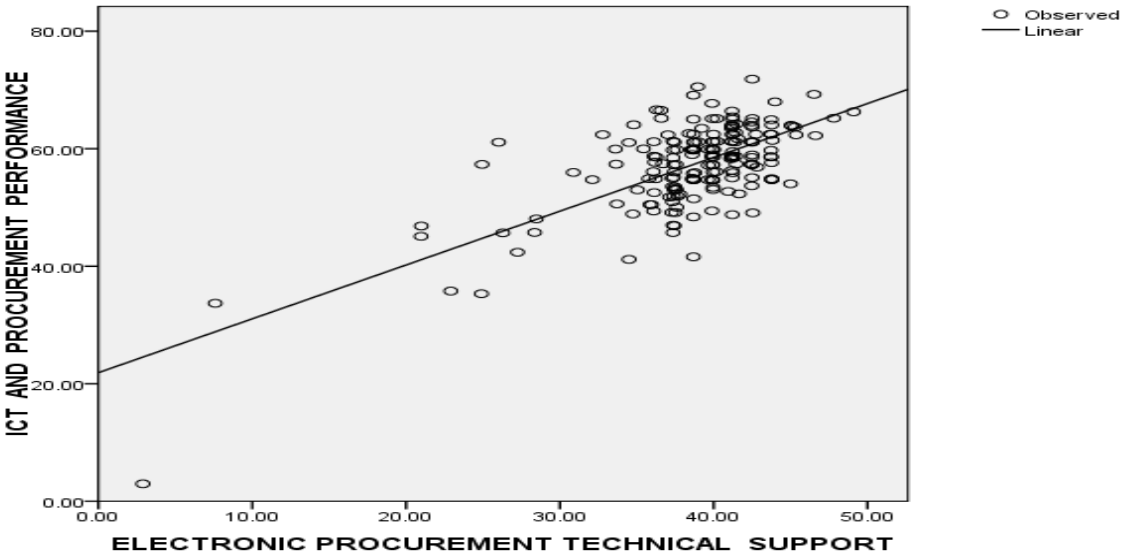

Figure 2: Correlation results on electronic procurement technical support

4.2.1.2 Correlation Co-efficient Analysis between Electronic Procurement Technical Support Staff and Procurement Performance

The results in table 3 indicate that electronic procurement technical support staff have a positive effect on procurement performance which is represented by correlation coefficient of 0.689 with 189 respondents. Further, the results show that electronic procurement technical support staff have a significant positive effect on procurement performance since the p-value is 0.000 which meets the threshold of p less than 0.05. We therefore reject the null hypothesis that there is no difference between the means and conclude that a significant difference exists.

Table 3: Correlation coefficient analysis on electronic procurement technical support staff

			Procurement performance	Electronic procurement technical support staff
Procurement performance	Pearson Correlation		1	.689
	Sig. (2-tailed)			.000
	N		189	189
Electronic procurement technical support staff	Pearson Correlation		.687	1
	Sig. (2-tailed)		.000	
	N		189	189

****Correlation is significant at the 0.01 level (2-tailed)**

4.2.2.3 Regression Analysis for Construct Electronic Procurement Technical Support Staff

Table 4 represents the regression model summary for the variable electronic procurement technical support staff with the coefficient of determination R^2 =0.472. This model confirms that there exists a strong positive relationship between electronic procurement technical support staff and procurement performance since R^2 which is referred to as coefficient of determination is 0.472. This indicates that application electronic procurement technical support staff explains 47.2% of the variations in procurement performance while 52.8% is explained by other variables not included in this model.

Table 4: Model summary for Construct Electronic Procurement Technical Support Staff

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.687[a]	.472	.469	5.47108

a. Predictors: (Constant), Electronic Procurement technical support staff

4.2.2.4 ANOVA Test for Construct Electronic Procurement Technical Support Staff

As shown in table 5, the F-statistic which is simply a ratio of two variances is 167.281 while df which is the degrees of freedom is indicated as 1. The linear model fits the data well since the p value is 0.000 which is less than 5%. This results indicate that the linear relationship between electronic technical support staff and procurement performance is statistically significant.

Table 5: ANOVA for Electronic Procurement Technical Support Staff

		Sum of Squares	df	Mean Square	F	Sig.
	Regression	5007.172	1	5007.172	167.281	.000[a]
	Residual	5597.427	187	29.933		
	Total	10604.599	188			

a. Predictors: (Constant), Electronic Procurement technical support

b. Dependent Variable: Procurement performance

To determine the effect of the independent variable on the dependent variable, the study used unstandardized. The unstandardized coefficients of correlation (B) indicate the average change in the independent variable associated with a unit change in the dependent variable statistically controlling for the other independent variables. Study results show that a unit change in electronic procurement technical support staff will change procurement performance by 0.610 holding all other variables constant.

Table 6: Coefficients

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
VARIABLES	**B**	**Std. Error**	**Beta**	**t**	**Sig.**	**Tolerance**	**VIF**
Constant	1.325	.253		5.237	.000		
Electronic procurement technical support staff	.610	.080	.412	7.618	000	.135	7.407

The optimal regression model therefore becomes:

Procurement Performance= 1.325 + 0.610 (Electronic Procurement technical support staff)

5.0 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Electronic procurement technical support staff was found to have the strongest effect on procurement performance. The electronic technical support staff have the required technical knowledge to deliver products and services that support procurement processes. They were also able to quickly respond to ICT related technicalities. In addition, the technical support staffs were able to understand and communicate the needs of procurement system users and regularly check and maintain the system to ensure confidentiality and data integrity. The staff requires regular training since ICT is very dynamic. Organizations that require to improve their procurement performance through use of ICT must invest heavily in their electronic procurement technical support staff.

Recommendations

From the summary of the findings and conclusions, a number of recommendations are provided. First, it is important that the electronic procurement technical staff undergo regular training so as to be in touch with the evolving technologies. They should be well equipped with the right information and knowledge on ICT so as to best improve the services. Moreover, the procurement staff should also receive specific skills on how they can utilize the information presented through ICT so as to make well-informed decisions on procurement practices in the organization. The trainings can be in form of on-job training, e-learning, seminars, workshops and even attending higher institutions of learning for further certification courses.

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REFERENCES

Abass, A.Y. & Okibo, K. B. (2014). Adoption of inter organizational system standards in supply chains: an empirical analysis of Rosetta Net standards, *Industrial Management and Data Systems*, 108 (4), 529–547.

Amaeba S.C., Nyamboke, G.P., Osoro, A. & Mburu, N. (2013). Challenges affecting public procurement process in Kenya: *International Journal of Research in Management*, 3(4).

Arthur, R. (2009). *Alignment Matters improving business functions using the procurement alignment framework*.

Arvanitis, S., Loukis, E. & Vasiliki, D. (2013). "The effect of soft ICT capital on innovation performance of Greek firms", *Journal of Enterprise Information Management*, 26 (6), 679 – 701.

Bailey, P. Farmer, D., Crocker, B., Jessop, D., & Jones, D. (2008). *Procurement Principles and Management, 10th edition.* London: Pearson Education Limited

Barney, J. B. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17, 99–120.

Bartezzaghi, E. & Ronchi, S. (2003). Internet supporting the procurement process: lessons from four case studies. *Integrated Manufacturing Systems*, 14 (8), 632-641

Barua, A., Konana, P., Whinston, A. B. & Yin. F. (2004). An empirical investigation of net-enabled business value: An exploratory investigation. *MIS Quart*. 28(4), 585–620.

Basheka, B. C. (2008). Procurement Planning and Local Governance in Uganda: A Factor Analysis Approach. Paper Presented at the 2008 *International Research Society for Public Management Conference*, from 26-28 March 2008, in Brisbarne, Australia.

Bertot, J., Jaeger, P. & Grimes, J. (2010). Using ICTs to create a culture of transparency: E-government and social media as openness and anti-corruption tools for societies, *Government Information Quarterly*, 27(3), 264-71.

Bharadwaj, A. S. (2000). ìA Resource-Based Perspective 17 on Information Technology Capability and Firm 18 Performance: An Empirical Investigation,î MIS 19 Quarterly (24:1), 2000, 169-196.

Bhatt, G.D. & Grover, V. (2005), "Types of information technology capabilities and their role in competitive advantage: an empirical study", *Journal of Management information Systems*, 22 (2), 253-277.

Caldwell, N.D., Roehrich, J.K. & Davies, A.C. (2009). Procuring complex performance in construction: London Heathrow Terminal 5 and a Private Finance Initiative Hospital. *Journal of Purchasing and Supply Management*, 15 (3),178-186.

Chatterjee, D. & Grewal R. (2006). Shaping up for e-commerce: institutional enabler of the organizational assimilation of web technologies. *MIS Quarterly*, 26(2), 65-89.

Cherop, P.J. (2016). Procurement practices influencing Project Implementation in Public Institutions in Kenya: Case of Kenya Electricity generating Company. *Journal of business and management*, 18 (5),47-71.

Chimwani, B. I., Iravo, M A. & Tirimba, O. I. (2014). Factors Influencing Procurement Performance in the Kenyan Public Sector; State Law Office. *International Journal of Innovation and Applied Studies.* 9 (4).2014, 1626-1650.

Chun, L., Chin-Chung, T. & Di, W. (2015). The Role of ICT Infrastructure in Its

Application to Classrooms: A Large Scale Survey for Middle and Primary Schools in China. *Educational Technology & Society*, 18 (2),249-261.

Christensen, C.M. (1997). The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail. Boston: Harvard Business School Press.

Croom, S & Brandon, A. (2007). Impact of e-procurement. Experiences from implementation in the UK public sector, *Journal of Purchasing and Supply Management*, 13 (4), 294-303.

Dai, Q. & Kauffman, R. J. (2000). Business Models for Internet-Based E-Procurement Systems and B2B Electronic Markets: An Exploratory Assessment, 34th *Annual Hawaii International Conference on System Sciences* (HICSS-34)-Volume 7.

Davila, A. Gupta, M. & Palmer, R.J (2003). Moving procurement systems to the internet: the adoption and use of E-procurement technologies models, *European management journal*, 21(1), 11- 23.

Essig, M. & Arnold, U. (2007). Electronic procurement in supply chain management: An information economics-based analysis of electronic markets. *Journal of Supply Chain Management*. 37(4), 43-49.

George, D., & Mallery, P. (2003). *Using SPSS for Windows Step by Step A Simple Guide and Reference* (4th ed.). London Pearson Education.

Gitahi, L. (2011). *Financial and Operational Performance: Pan African Media Conference*.

Harink, J. & Van Rooijen, G. (2002), "*Framework for the application of e-procurement theoretical framework properly models the situation at Dutch Railways*," in 11th Annual International Purchasing and Supply Education and Research Association. Twente University, Netherlands

Harland, C.M., Caldwell, N.D., Powell, P. & Zheng, J. (2007), Barriers to supply chain information integration. *Journal of operation Management, 25*(6), 34-54.

Ideet, I. L & Wanyoike D. (2014) Role of Buyer-Supplier Relationship on Supply Chain Performance in the Energy Sector in Kenya: A Survey of Kenya Power and Geothermal Development Companies. *International Journal of science and research,* 3, (10), 2418-2424.

Jeyaraj, A., Rottman, J. & Lacity, M. (2006). A review of the predictors, linkages, and biases in IT innovation adoption research. *Journal of Information Technology*, 21(1), 1-23.

Kabaj. O. (2010). *The Challenges of African Development*. UK: Oxford.

Kakwezi, D. & Nyeko, P. K. (2010). Procurement Processes and Performance: *Efficiency and Effectiveness of the Procurement Function*.

Kiage, J. (2013). Factors Affecting Procurement Performance: A case of Ministry of Energy. *International Journal of Business and Commerce*, 3(1), 54-70

KIPPRA, (2005). *Strategies for Securing Energy Supply in Kenya*.

Kraaijenbrink, J., Spender, C., & Groen, A. (2010): The resource –based view: A review and assessment of its critiques. *Journal of Management*, 36(5), 364-381.

Lee, W .B. (2010). On a responsive supply chain information system, *International Journal of Physical Distribution & Logistics Management*, 30, 598-610.

Lewis, A. & Roehrich, K. (2009). Contracts, relationships and integration: Towards a model of the procurement of complex performance. *International Journal of Procurement Management*, 2(2), 125-142.

Loh, L. & Venkatraman, N. (1992), "Determinants of information technology outsourcing: a cross-sectional analysis", *Journal of Management Information Systems*, 9 (1), 7-24.

Lysons, K. & Farrington, B. (2012). *Purchasing and Supply Chain Management*. Pearson Education Limited, England.

Mahapatro, B.B. (2010). *Procurement and Supply Chain Management*. New Age Publishers, New Delhi.

Malela, G. (2010). *E-Procurement Model for the Public Sector of Kenya*. MSC Thesis, School of Computing and Informatics, University of Nairobi.

Mishra, A. N., Konana, P. & Barua, A. (2007). Antecedents and consequences of Internet Use in Procurement: *An Empirical Investigation of U.S. Manufacturing Firms. Information Systems,* 18(1),103-120.

Mwangi, P. & Mburu, D. K. (2015). Effect of information and communication Technology on Procurement performance in kenya. *IJRDO-Journal of Mechanical and Civil Engineering*Volume-1, Issue-4.

Mutangili, S.K. (2014). An Assessment of the Adoption of E-procurement Application Systems on Supply Chain Management Environment in Kenya: a case of Zain Kenya Limited. *International Academic Journals*, 1(1), 38-61.

Mutula. S.M. & Brakel, P. (2007). ICT skills readiness for the emerging global digital economy among small businesses in developing countries: Case study of Botwana. *Library High Tech*, 25(2), 231-245.

Mutunga A., Nyanamba S.O. S. & Okibo, W. (2013). The Effect of E-Procurement Practices on Effective Procurement in Public Hospitals: A Case of Kisii Level 5 Hospital. *American International Journal of Contemporary Research* Vol. 3 No. 8.

Nchunge, M. D., Sakwa, D. M. & Mwangi, P.W. (2013). Assessment of ICT Infrastructure on ICT Adoption in Educational Institutions: A Descriptive Survey of Secondary Schools in Kiambu County Kenya. *Journal of Computer Science & Information Technology, 1(1),* pp. 32-45.

Ochieng', J. & Muehle, M. (2014). Development and Reform of the Kenyan Public Procurement System (5th *International Public Procurement Conference*, Seattle, 17th August 2012) 1762.

Ohashi, H. (2009). Effects of Transparency in Procurement Practices on Government Expenditure: A Case Study of Municipal Public Work *Review of Industrial Organization* 34, 3 (May 2009), 267-285.

Porter, M.E. (1980) "*Competitive Strategy*", The Free Press, New York.

PPOA, (2013). *County Governments Procurement Regulations* 2013. Retrieved from www.ppoa.go.ke/2015-08-24-14-47-43/circulars

PPOA, (2009). *Public Procurement Circular*. Retrieved http://www.ppoa.go.ke/8-ppoa-circular-no-1-2009.

Presutti, W.D. (2008), "Supply management and e-procurement: creating value added in the supply chain", *Industrial Marketing Management*, 33 (2), 219-222

Republic of Kenya (RoK), (2013). *Strategy Paper for IFMIS 2004 -2009*. National Government Printer.

Republic of Kenya (RoK), (2014). *Second medium term plan 2013-17*. National Government Printer.

Ruzindana, I. & Kalaskar, P.B. (2016). The Adoption of e-Procurement and its impact on the Procurement Performance of Selected Telecommunication Companies in Rwanda. *European Journal of Business and Management.* 8 (15),15-20.

Sabiiti, K.C, Muhumuza, E. & Basheka, B.C. (2011), "Developing public procurement Performance measurement systems in developing countries: the Uganda experience"

Segal, G. & Taylor, M. (2001). *Electronic Procurement: How Technology is Changing Government Purchasing*. E-Brief number 111. Reason Public Policy Institute.

Sekaran, U. (2010) Research Methods for Business: A Skill-Building Approach. 4th Edition, John Wiley & Sons, UK.

Shalle, N.I, Guyo, W., & Amuhaya, I. M. (2014).Role of inventory optimization. Journal of supply chain Management. 32 (7), 139-141

Silver, E.A., Pyke, D.F. & Peterson, R. (2008). *Inventory Management and Production Planning and Scheduling*. John Wiley & Sons, New York.

Subramaniam, C. & Shaw M. J. (2007). The Effects of Process Characteristics on the Value of B2B E-Procurement. *Information Technology and Management*, 5, 161-180.

Suleiman, M. (2015), Adoption of e-procurement and value addition to Tanzanian public institutions. *European Journal of Business and Management*, 7 (14),104-125.

Talluri. W. (2008). Benchmarking the performance of English Universities, *Benchmarking International Journal*, 14 (1),102-122.

Vadim, K. (2007). "*Small and medium enterprises and ICT*", Asia-Pacific Development Information Programme.

Verissimo P. J. (2009). The new supply chain's frontier: Information management. *International Journal of Information Management*, 29 (5), 372-379.

Victor, B., Gevers, J. & Weele, A. J. (2012). Managing Sourcing Team Effectiveness: The need for a team perspective in purchasing, *Journal of Purchasing and Supply Management*.

Vulkan, N. (2008). *The economics of e-commerce:A strategic guide to understanding and designing the online marketplace*. Princeton: Princeton University Press.

Wagner, H.T. & Ettrich-Schmitt, K. (2009). "Slack-enabled innovation versus problemistic search: findings from case studies among SME", *Proceedings of the European Conference on information Systems (ECIS)*.Verona, 8-10 June.

Wanjiru, D.K. & Abdalla, A. (2014). Effects of Information Communication Technology Adoption on Procurement Process in Kenya's Oil Industry: A Survey of Total Kenya Limited Mombasa County. *International Journal of Management and Commerce Innovations*, 2(2), 89-116.

Wernerfelt, B. (1984), "A resource based view of the firm", *Strategic Management Journal*, 5 (2),171-180.

World Bank (2013). *Final Report: Preparation of Guidelines on How to Prevent Corruption and Promote Integrity in the Selection and Employment of Professional Consultants*.