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EFFECT OF ELECTRONIC TENDERING ON SUPPLY CHAIN PERFORMANCE OF THE COUNTY GOVERNMENT OF HOMA-BAY, KENYA

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Abstract

Electronic tendering is the use of electronic method to conduct procurement functions which entail tendering process. It is rapidly supporting organizational structure transformation and coordination of the business relationships. In Kenya, statistics show that out of 100 organizations implementing electronic tendering, 25% fail in the same. There is thus a challenge still encountered despite the developments in electronic tendering. In addition, there are very few studies conducted with regard to the electronic tendering. The study therefore sought to establish effects of electronic tendering on supply chain performance of the county government of Homa-Bay, Kenya. The study was based on the theories of disruptive innovation, and technology acceptance. A correlational research design was adopted. Target population of the study was 400 staff based on the 10 departments of the county government of HomaBay. Simple random sampling was used to sample 196 respondents while 30 questionnaires were piloted which were excluded from the main study to iron out any ambiguities, tested and purged using the SPSS. Cronbach Alpha technique for reliability with threshold of 0.705 indicated that the instrument is reliable and, content and construct validity confirmed that the instrument was

also valid. Descriptive and inferential statistics were used to analyzed quantitative data while verbatim reports and transcriptions were used to analyze qualitative data. The study revealed that electronic tendering had positive and significant effect on supply chain performance and accounted for significant variance, (β=.809, R2=.654, p=.000). These findings imply that electronic tendering has a positive and significant effect on supply chain performance. The study recommends that the county Government carries out electronic tendering awareness to enhance the understanding and practices and thereby improve supply chain performance.
Keywords: Electronic tendering, Supply chain, Performance, County government, Procurement

INTRODUCTION

Supply chain performance refers to the extended supply chain's activities in meeting end-customer requirements, including product availability, on-time delivery, and all the necessary inventory and capacity in the supply chain to deliver that performance in a responsive manner (Wong & Wong, 2007). Supply chain performance refers to the evaluation of supply chain management, and includes both tangible (for example cost) and intangible (for example capacity utilization) factors (Kaplan & Norton, 2004).

Moreover, supply chain performance crosses company boundaries since it includes basic materials, components, subassemblies and finished products, and distribution through various channels to the end customer. It also crosses traditional functional organization lines such as procurement, manufacturing, distribution, marketing & sales, and research and development. During the first decade of the new millennium, public procurement greatly benefited from the diffusion of electronic procurement (Gardenal, 2013). According to Gardenal(2013), specific set of technologies and organizational solution have been introduced worldwide, particularly granting public authorities the possibility to manage tendering procedures and auctions online. Similarly, as what have already been witnessed in the private sector, the initial implementation of public e- procurement solution has been saluted with a great hype (Gardenal, 2013). Globally, electronic procurement is one of the recognized procurement best practices. It plays a central role to the performance of the procurement function and that of the organization because other best practices like green purchasing, partnering, Total Quality management (TQM), Just-In-Time (JIT) and risk management apply the concept of electronic procurement or Information Communication Technology (ICT) applications.

In Africa, the concept of electronic tendering is just gaining popularity especially in the public sector to deal with the problems of lack of accountability and transparency in procurement activities in the public sector, electronic procurement platforms have scored highly

towards influencing efficiency in procurement (Azanlerigu & Akay, 2015). Electronic tendering has been a key executive requirement among critical government agencies in Kenya. Traditionally, most public procurement operations were manual; this was deemed to lack transparency, accountability and fair competition (Maruti & Otinga, 2019). The Kenya Government's tendering system was originally contained in the Supplies manual of 1978, which was supplemented by circular that were issued from time to time by the treasury (Orina, 2013). The Kenya Government alongside development stakeholders such as the international trade Centre (ITC) the World Bank and the African Development Bank Highlighted the importance of e- tendering in sealing of the aforementioned setbacks through accountability and effectiveness: (Matunga, Nyanamba & Okibo, 2015).

In Africa, the concept of electronic tendering is just gaining popularity especially in the public sector to deal with the problems of lack of accountability and transparency in procurement activities in the public sector, electronic procurement platforms have scored highly towards influencing efficiency in procurement (Sijaona, 2010).

Electronic tendering has been a key executive requirement among critical government agencies in Kenya. One of the objectives of government policy through electronic tendering is to attain economic growth reduce poverty as well as manifest significant enhancement in the provision of service to Kenyan citizenry (Ndiiri, 2016). However, public operation spend huge budget on procurement and up to 60 percent of public expenditures goes to public procurement (Kipkorir,2013; Makabira & Waiganjo, 2014). Through flawed public procurement process, large sum of tax payers' money have been lost in Kenya in the past the main reason being low personal ethics standard by concerned parties and organization structure and the environment (Kangogo & Kiptoo, 2013). The purpose of this study was to therefore determine the effect of electronic tendering on supply chain performance of county governments in Kenya with a case study of Homa Bay County.

LITERATURE REVIEW

Ombat (2015), conducted a study titled "The relationship between electronic procurement systems and performance of procurement function in commercial banks in Kenya". The target population constituted 486 members of staff of Kenya Commercial Bank who were of different managerial levels currently working at the bank. From this target population, total 97 participants who were selected using simple random sampling technique. Total 81 questionnaires were duly completed and returned, thus representing 84%. The instruments for data collection were semi-structured questionnaire which were researcher-administered. Collected data were then processed and analyzed using descriptive statistics. The study findings established that open

system of electronic tendering leads to the purchase of inferior materials and speeding up of the work. However, open electronic tendering often led to unscrupulous suppliers being awarded contracts. It was further recommended that procuring entities be aware of the risks posed by the e-systems and should practice lots of internal controls for risk management and to limit quality related problems (Ombat, 2015).

Chegugun and Kibet (2018) did a study titled “Effect of electronic tendering on organizational performance in selected public hospitals in UasinGishu County, Kenya”. The study employed a descriptive survey of 5 hospitals. The sample size was 367 respondents who responded to questionnaires after being sampled using simple random sampling technique. The data collected was then coded and entered into the Statistical Package for Social Sciences (SPSS) Version 22. The study findings indicated that electronic tendering has increased competitiveness in the tendering bid for the hospital. Furthermore, the hospital had put in place electronically enabled procurement systems that allow individuals and hospitals to bid for any amount of tender they find suitable and in line with their profession or qualifications. The study recommended the electronic tendering to be adopted for all hospitals to enhance performance (Chegugun and Kibet, 2018).

Kuloba, Kibetand Ayuma (2017), conducted a research entitled “Influence of tendering procedures on organizational performance at Moi Teaching and Referral Hospital, Uasin-GishuCouty, Kenya”. The study employed a case study research design in collecting relevant information. The total populations for this study were 3600 respondents with a sample size of 384. Stratified and simple random sampling techniques were employed. Data was collected using a questionnaire and the findings were analyzed using both descriptive (frequencies and percentages) and inferential statistics (correlation analysis). The study adopted institutional and socio-economic theory to provide a relevance to the study. The results established a positive correlation between electronic tendering and performance of organizations. The study recommends that there is need to enormously implement procurement policies which encourage tendering, in order to enhance performance (Kuloba*et al*., 2017).

Barngetuny and Kimutai (2015) conducted a study titled “Effects of electronic procurement on supply chain management performance in ElgeyoMarakwet County”. The study adopted the use of questionnaires and interview schedules to collect primary data. The research also adopted descriptive design to collect the quantitative and qualitative data that describes the effects of electronic procurement and supply chain management. The target population for this study was employees in public entities in ElgeyoMarakwet County; this included the County Government of ElgeyoMarakwet and Iten County Referral Hospital. Qualitative data was analyzed through content analysis, while quantitative data was analyzed through the use of

frequency distribution, mean scores and standard deviations with the help of Statistical Package for Social Science (SPSS). With regard to electronic tendering and supply chain management, a majority of the respondents were of the opinion that there is increased tendency towards market structures and could be interpreted to mean that the market that enabled the supply of the company's products and services is large enough to accommodate the business. It was recommended that the institution should provide the supplier with access credentials for the supplier portal because it will increase users access to information in the electronic procurement service with effective internet and thus an increase in chances of selecting the best supplier company for electronic tendering (Barngetuny & Kimutai, 2015).

RESEARCH METHODOLOGY

This study adopted a correlational research design. A research design functions as the research blue print for measurement and analysis of data: Kothari 2004, describe a research design as a plan and a structure of investigation conceived to find answers to research questions. The study used correlation research design because the researcher does not believe that the statistical relationship between the variables is a causal one (Spickard, 2017).

The study used the research paradigm of critical realism. This is because critical realism can be used for both qualitative and/or quantitative research methods, which is the essence of mixed research methods. Critical realism provides an ontology that can theorize reality, support conceptualizing, and offer guidance in experiential work in the human and natural sciences (Clark, 2008). Critical realism provides a 'third way', which is neither positivist nor constructionist, but which may be synthesis to the thesis and antithesis of each (Burgoyne, 2008).

The population of interest in this study consisted of 400 employees from 10 departments of the County government of Homabay, Kenya. Stratified sampling was carried out to ensure equitable distribution of sample size per strata. Stratas in this case were County government ministries. Simple random sampling, which is a sampling technique where everyone has the same chance or probability of being included in the sample to participate in a research study was then be adopted (Creswell, 2012; Spickard, 2017).

S = required sample size,

X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841),

N = the target population of the staff which is 400

P = the population proportion (assumed to be 0.50 since this provides the maximum sample size),

d = the degree of accuracy expressed as a proportion (0.05).

$$s = \frac{X^2 NP(1-P)}{d^2(N-1) + X^2 P(1-P)}$$

$$s = \frac{3.841 \times 400 \times 0.5(1-0.5)}{0.05^2 \times (400-1) + 3.841^2 0.5(1-0.5)}$$

$$s = \frac{384.1}{1.95775}$$

$s = 196.1946 \approx 196$

s = 196

Quantitative data was analyzed using descriptive and inferential statistics to address the research objectives. Qualitative data regarding the effects of Electronic tendering on organization performance was analyzed using content analysis to measure the semantic contents of the message. Multiple regression was used in the research, because there are many independent variable which are electronic tendering, and one dependent variable which is the supply chain performance. The researcher chose to use multiple regressions because the dependent variable is metric and single. F- test was used to test the research hypotheses in the study. Analysis of variance will also be used to analyse the variance of the sample. This was done with the assistance of SPSS which is quantitative analysis software. Multiple regression equation assumes the form $\hat{Y} = a + b1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + \varepsilon$

a is the ($\hat{Y}$) intercept, b_1 is the coefficient for X_1; b_2 is the coefficient for X_2; b_3 is the coefficient for X_3; b_4 is the coefficient for X_4; ε is the error term

Where X_1 is electronic tendering, X_2 is electronic invoicing, X_3 is electronic purchasing and X_4 is e-auction which are four independent variables and Y being the dependent variable which is supply chain performance, and the constants a, $b1$, $b2$, $b3$ and $b4$.

RESULTS AND DISCUSSION

Table 1: Electronic tendering and Performance of Supply Chain

Variable	Category	Frequency	%
Effect of E Tendering	Yes	146	75.6
	No	47	24.4
Total		193	100.0
Extent of Effect	Always	40	21.1
	Moderate	94	49.5
	Rarely	12	6.3
Total		146	100.0

The findings shows that over 50%, 73(76.6%) of the respondents indicated an influence of e tendering on performance of supply chain. On the other hand, only 47(24.4%) of the respondents indicated no effect. Out of the 76.6% that showed that electronic tendering had an effect on performance of supply chain, 40(21.1%) said that there was always an effect while 94(49.5%) noted a moderate effect leaving out 12(6.3%) who observed that the effect was rare. It can be concluded from these responses that there electronic tendering has an effect on performance of supply chain in the county government of Homa Bay.

In addition to these findings, respondents that observed moderate effect found explicit reasons behind the effect. It emerged that there were "*some contractors that were not IT compliant with tendering process*" as reported by respondent 036. These observations were also repeated by most of the respondents that reported on a moderate effect. This implies that the slow or moderate effect resulted from lack of training or other factors not covered in the study. However, it is clear that electronic tendering has an effect on supply chain performance.

Among the respondents that indicated that the effect was "always", one of the reason as noted by respondent 034 was that "it makes the process easier and effective". Another respondent noted that "it enhances transparency as it is more open", respondent 027. These findings based on qualitative report clearly indicates that electronic tendering for whatsoever reason, has had an effect on supply chain performance.

Further findings were also presented to establish the nature of electronic tendering and effect on performance of supply chain using a Likert scale. Respondents were also asked to rate the scale and the findings presented using frequency counts, percentages, means and standard deviations. The findings are presented as shown in Table 2.

Table 2: Electronic tendering Practices

Electronic tendering and SC performance	SD F (%)	D F (%)	N F (%)	A F (%)	SA F (%)	M	SD
Electronic tendering ensures that there is an easy short listing of tender	4(2.1)	0(0.0)	17(8.8)	77(39.9)	95(49.2)	4.32	0.82
It enables a competitive tendering process, thereby levelling the playing field.	2(2.1)	0(0.0)	9(4.7)	55(28.5)	125(64.8)	4.51	0.78
It ensures an easy access of information	2(2.1)	0(0.0)	6(3.1)	62(32.1)	121(62.7)	4.53	0.76
It ensures accountability in the tendering process	2(2.1)	5(2.6)	4(2.1)	44(22.8)	136(70.5)	4.56	0.86
Electronic tendering guides one through a very structured process.	2(2.1)	0().0)	11(5.7)	71(36.8)	107(55.4)	4.43	0.78
Overall mean and SD						4.47	0.040

Table 2 shows practices of electronic tendering as indicated by various statements. One of the ease of electronic tendering is that it ensures that there is an easy shortlisting of tenders. Majority of the respondents, 95(49.2%) strongly agreed and 77(39.9%) agreed over this statement with a mean of 4.51 and standard deviation of 0.78. A larger majority of the respondents, 125(64.8%) strongly agreed that electronic tendering enables a competitive tendering process, thereby leveling the playing field.

There was also emerging findings that electronic tendering ensures easy access of information as agreed by majority, 121(62.7%) with a mean of 4.53 and standard deviation of 0.76 besides ensuring accountability in the tendering process as indicated by majority, 136(70.5%) with a mean of 4.56 and standard deviation of 0.86. Finally, the findings shows that electronic tendering guides one through a very structured process as indicated by majority, 107(55.4%) of the respondents with a mean and standard deviations shown (M=4.43, SD=0.78). The overall average findings (M=4.47, SD=0.04) implies that there was a high rating on electronic tendering improvement on supply chain.

To compliment these findings, simple linear regression model was carried out in order to establish whether electronic tendering led to better performance of supply chain. The findings are presented as shown in Table 3 and 4.

Table 3: Summary Effect of Electronic tendering on Supply Chain Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.809[a]	.654	.651	.32350	.654	176.040	1	191	.000	1.503

a. Predictors: (Constant), Electronic tendering
b. Dependent Variable: performance

Table 4: Model Coefficient Effect of Electronic tendering on Supply Chain Performance

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.333	.239		5.588	.000		
	Electronic tendering	.702	.053	.809	13.268	.000	1.000	1.000

a. Dependent Variable: performance

The findings in Table 3 and 4 indicates that electronic tendering accounts for 65.4% variance in supply chain performance. After controlling for over estimation, the percentage variance reduces to 65.1% leading to shrinkage of 0.3%. The standard error of estimate was also small (0.323) implying that the estimates were closer to the outcome. These findings were therefore significant, F(1,191)=176.040, p=.000, implying that the model was not by chance but

as a result of good fit. Further findings to indicates the effect of electronic tendering on performance were as well significant (β=.809, p=.000). This means that electronic tendering alone is a very strong predictor of supply chain performance.

Evaluation of several predictors as shown in Table 4 revealed that electronic tendering was a significant predictor (β.248, p=.000) implying that when the predictor is compared with other predictors, its predictive power reduces but it remains significant. Further comparison of the two models reveals that for electronic tendering as a single predictor, a one standard deviation in electronic tendering leads to 0.809 unit increase in supply chain performance. However, compared with other predictors, the findings indicate that a one standard deviation in electronic tendering leads to 0.248 unit increase in supply chain performance.

As a result of positive and significant effect of electronic tendering on supply chain performance, it is deduced from the findings that electronic tendering has a positive and significant effect on supply chain performance. This implies that electronic tendering is practiced in the county and these results to a better supply chain performance.

These findings together with the qualitative findings are in line with other findings such as: Kuloba, Kibet and Ayuma 2017, findings which revealed a positive correlation between electronic tendering and performance of organizations. The findings also agreed in part with Barngetuny and Kimutai 2015, findings which established a link between electronic tendering and supply chain performance leading to increased tendency towards market structure. Other studies such as Chegugun and Kibet 2018, also advocated adoption of electronic tendering in order to improve organizational performance. Although: Ombat 2015 ,study indicated that open electronic tendering often led to unscrupulous suppliers being awarded contracts, most of the studies have associated better supply chain performance on electronic tendering. It is thus concluded that electronic tendering has a positive effect of supply chain performance. The null hypothesis was thus not adopted and the alternative hypothesis adopted meaning that there is a positive and significant effect of electronic tendering on supply chain performance of Homa Bay County.

CONCLUSIONS AND RECOMMENDATIONS

Electronic tendering is a very important practice in the process of electronic procurement. An increased electronic tendering means that there is easy shortlisting of tenders as well as competitive tendering process that is different from the manual traditional processes. As a result of being electronic, there is easy access to information, accountability and the process is structured. This leads to a positive effect on supply chain performance which heavily relies on

these processes. Therefore electronic tendering is a significant predictor of supply chain performance such that it leads to higher performance in the supply chain.

It was clear that there was a small percentage of respondents who did not approve of electronic tendering. This is largely due to lack of understanding of the practice. It is highly advocated that the county carries out electronic tendering awareness to enhance the understanding and practices. Besides, the study recommends that electronic tendering be improve in the county. Future researchers can consider introducing a moderator/mediator variable to ascertain its effect on the relationship between electronic procurement and supply chain performance.

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