



EFFECT OF E-PROCUREMENT PRACTICES ON EFFICIENCY FRONTIER OF KAKAMEGA COUNTY GOVERNMENT

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Abstract

Globally; e-procurement has gained popularity especially with the advent of technology. In Kenya, organizations are adopting e-procurement to efficiently obtain resources. Previous studies have not focused on e-procurement as a means to harnessing the available resources and, its relationship with efficiency frontier. It is for this reason that this study sought to establish effect of e-ordering on efficiency frontier of Kakamega County government in Kenya. The study was based on innovation diffusion theory and resource based view theory and adopted correlational survey design. The study population comprised all the 104 staff of the county government involved with the procurement function obtained through census and data collected using structured and semi structured questionnaire as well as interview schedule. Validity and reliability of questionnaire was tested on pilot data targeting 14 respondents where a Cronbach alpha of 0.763 was obtained. Descriptive statistics was applied to analyze quantitative data. Major findings were that, the availability of websites to facilitate e-procurement within the County Government of Kakamega was low and this might affect their efficiency in procurement. In addition, placing orders for supplies online within the County Government of Kakamega was done to a low extent. There was also less availability and reduced application of e-procurement platform and practices in e-ordering within the County Government of Kakamega and this ultimately affects their efficiency in performance of the procurement function. The study recommends that procurement departments in county governments should adopt a user-friendly information system that all suppliers can use with ease be they tech savvy or the old suppliers. This will reduce the bias on the use of electronic procurement and all will embrace it on procurement staff competencies.

Keywords: *county government, e-ordering, efficiency frontier*

I. INTRODUCTION

Efficiency frontier is a concept in operations that states that an organization is 'efficient' if it has the highest perceived value or service level for a given cost. Thus it indicates the operational efficiency of the organization considering whether the organization is a low-cost provider or a high-cost provider and how should it position itself as per their strategy. Today, organizations find themselves facing rapid series of market shifts, new technological innovations, and changes in government policies (Eisenhardt & Brown, 2009). The mirror image of such phenomena is an increasingly turbulent environment that firms have to deal with (Haeckel & Nolan, 2008; Bradley and Nolan, 2008). As a consequence, successful organizations are those that have learnt how to be innovative and creative without renouncing to the level of discipline that is instrumental in effectively executing plans. In doing so, they have to modify their organizational designs, taking advantage of Information and Communication Technologies (ICTs). ICT is a critical enabler of the redefinition of the organization. It permits the distribution of power, function, and control to wherever they are most effective; given the mission and objectives of the organization and the culture it enjoys (Morton, 2010). The organizations are seeking to improve their efficiency frontier thereby increasing their value.

Due to increasing trend toward purchasing inputs and other raw materials from outside the organization, implementing electronic procurement (e-procurement) has become a significant tactic in most companies' e-business strategies (Deloitte Consulting, 2001). Today baseline procurement capabilities are rapidly

becoming a cost of doing business. More and more companies are conscious of the needs to introduce Internet-based technologies in their order process, due to the benefits of saving transaction cost, increasing competitive sourcing opportunities, and enhancing inter-organizational coordination.

E-procurement refers to business-to-business or business-to-consumer or business-to-government purchase and sale of supplies, work and services through the internet as well as other information and networking systems, such as electronic data interchange and planning (Muhia & Afande, 2015). It is also known as electronic procurement or supplier exchange. According to Croom and Brandon-Jones(2004) e procurement is the use of internet-based integrated information and communication technologies (ICTs) to carry out individual or all stages of the procurement process including search, sourcing, negotiation, ordering, receipt, and post-purchase review While there are various forms of e-procurement that concentrate on one or many stages of the procurement process such as e-contracting, e-information sharing, e-ordering and e-sourcing, e-Procurement can be viewed more broadly as an end-to-end solution that integrates and streamlines many procurement processes throughout the organization (Muhia & Afande, 2015).

Roma and McCue (2012) defined e- procurement as the use of information technology to develop a procurement process that is responsive to changes in the environment. The concept of e-procurement is adopted by literally all industries and all kinds of organizations. Specifically, in the public sector, e-procurement is driven by social, cultural and political factors (Garran, 2005). Implementation of e-procurement in public procurement requires resources and specialized skills. In addition, the

process requires a well-coordinated change management systems and training program (Garran, 2005). It is also important to put into place practices, processes and systems for the implementation of e-procurement (Vaidya, Sajeev & Callender, 2006). Other factors that are critical in implementation of e-procurement include: good governance and capacity developments (United Nations, 2011).

Raju Sheth (2009) further says that, the broad spectrum of e-Procurement is much more than just a plain vanilla system for making purchases online. It is a comprehensive platform - using the Internet to make it easier, faster and cost effective for businesses to source their requirements on a timely basis, and in a way that is aligned with organizational goals and objectives. In the current scenario, characterized by focus on key strategic initiatives, lesser time-to-market and increased global competition, e-Procurement aids organizations in streamlining their entire purchasing process, so that they can focus on core business activities and increase profitability. There is increasing use of internet technology to buy goods and services from a number of known or unknown suppliers, to perform e-informing which is gathering and distributing purchasing information both from internal and external parties and to expand e-market sites on web-based Enterprise Resource Planning (ERP) to open up value chains. Buyers can access preferred suppliers' products and services, add to shopping carts, create requisition, and seek approval, receipt purchase orders and process invoices with integration to suppliers' supply chains and buyers' financial systems (Jessop, 2006).

Through e-procurement web sites allow qualified and registered users to look for buyers or sellers of goods and services and perform transactions.

Depending on the approach, buyers or sellers may specify costs or invite bids. Transactions can be initiated and completed. Ongoing purchases may qualify customers for volume discounts or special offers. E-procurement software may make it possible to automate some buying and selling. Companies participating expect to be able to control parts inventories more effectively, reduce purchasing agent overhead, and improve manufacturing cycles. E-procurement is expected to be integrated into the wider Purchase-to-pay (P2P) value chain with the trend toward computerized supply chain management (Martin, 2006).

Globally, e-procurement has gained popularity especially with the advent of technology. In United States of America for instance, rapid development of e-procurement was reported in early 2000 just before the recession. By the end of the same year, it was reported that all state functions were maintaining web presence in at least some stage of their procurement processes with some participating in online bidding (Reddick, 2004). In Malaysia, the government at some point issued a statement calling for all suppliers to use the e-procurement system (Yossuf *et al.*, 2011). Kaliannan *et al.*, (2009) pointed out that Malaysian public sector are going through a rapid change especially as far as adoption of technology is concerned. Adoption of e-government and particularly e-procurement is inevitable for the government. A review conducted by Commonwealth of Australia indicates that the National governments of Italy, New Zealand, Scotland, New South Wales and Western Australia in 2005 revealed that these countries were already using e-procurement system for public procurement activities.

In Africa, the concept of e-procurement 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, Most African countries have resorted to legal reforms and adoption of procurement. Tanzania for instance put into place e-procurement systems to allow e-sharing, e-advertisement, e-submission, e-evaluation, e-contacting, e-payment, e-communication and e-checking and monitoring to ensure all public procurement activities are conducted online (Sijaona, 2010).

In Kenya, the government actively got involved in adoption of e-procurement when the Jubilee government came into power. Since then there has been a lot of pressure and reforms to ensure all public procurement functions are conducted online. The Kenyan government made it mandatory for procurement of all public goods, works and services to be procured through online platforms (USAID, 2008). For County governments in particular, there is a directive for all procurement and finance operations to be conducted online. For instance, the government introduced integrated financial management information system (IFMIS) that is mandatory for all the 47 counties. IFMIS was introduced to improve governance by providing real time financial information and effectively programs, formulate budgets.

It also enhances transparency and accountability and acts as a deterrent to corruption and fraud (USAID, 2008). Sabahi (2013) explains that the Kenyan Budget Controller in 2013 indicated that county governments needed to revise their budgets after a report from the Commission on Revenue Allocation (CRA) revealed that 25 of Kenya's 47 counties faced financial challenges.

Similarly, Ustawi (2013) also explains that in 2013, the COB was steadfast in demanding that the county governments immediately implement lawful internal checks and balances in accordance with the Public Finance Management (PFM) Act of 2012, over County Funds.

Statement of the problem

Despite the importance of county governments especially in Kenya's current landscape, they face a myriad of challenges which they have attributed to delayed funding from national government (Korir, 2014). Further, earlier researchers such as Rotich and Okello, (2015) indicated that costs hamper public participation in county resource management and that county governments, particularly in Western Kenya, require increased vigilance on county resources given the population associated with them. Given that resource management was a bigger challenge in western Kenya and Kakamega county is one of them, there was need to establish the contribution of public procurement process to this and particularly what role e procurement may play since there has never been an attempt to attribute the same to the county governments' procurement process. Moreover previous studies, even in other contexts, have not addressed e-ordering specifically. Particularly, they have not addressed e-ordering and its relationship with efficiency frontier.

Similarly, no studies concentrated on effect of e-contracting on efficiency frontier. Therefore, knowledge was lacking on the relationship e-ordering, e-sourcing and e-contracting has with efficiency frontier in Kakamega county government. From the literature, it can also be pointed out that a number of the studies focused on adoption of e-procurement. For instance,

Batenburg (2007) conducted a study on e-procurement adoption by European firms.

Others such as Yen and Ng (2013); Matunga, Nyanamba and Okibo (2013); Rotich and Okello (2015); Wojciech and Zahir (2010) and Vaidya, Sajeev and Callender (2006) majorly looked at impacts of e-procurement and e-commerce adoption, operational performance associated with e procurement and or e-commerce, perceptions of managers on e-procurement, plans for e-procurement adoption and factors affecting e-procurement and e-procurement users' information behavior. However, none of the studies examined e-ordering and efficiency frontier of government institutions and this implies that there is scanty knowledge on the effect of e-ordering on efficiency frontier of Kakamega county government. The present study therefore sought to investigate effect of e-ordering on efficiency frontier of Kakamega county government.

Objective of the study

The main objective of this study was to determine the effect of e-ordering on efficiency frontier of Kakamega county government.

II. LITERATURE REVIEW

Theoretical Framework

The study was anchored on Resource Based View Theory as advanced by Prahalad and Hamel (1990). The theory argues that resources internal to the firm are sources of competitive advantage. According to the theory such resources should be valuable in that they should be rare, inimitable and difficult to substitute. This theory is focused on internal organizational capabilities of an entity which it prescribes if harnessed, enables achievement of higher performance. The study

also borrows from the Innovation diffusion theory proposed by Rogers (1962) which presents that innovation is a process aimed to improve economic development. According to innovation diffusion theory, innovation is defined as an idea perceived as new by individuals.

Empirical review of related literature on E-Ordering and Efficiency

Yen and Ng (2013) also conducted study on the impacts of e-procurement in the procurement process on the supply chain by analyzing the project of Hong Kong Textile. They used SWOT analysis to describe impacts in each stage of procurement process. Strengths and weaknesses were used as internal performance measurement in the procurement process, for example, efficiency, and effectiveness.

Matunga, Nyanamba and Okibo (2013) assessed the effect of e-procurement on efficient procurement in public hospitals. The objectives of the study were to assess the extent to which e-procurement has improved the quality of goods in public hospitals, to determine the extent to which e-procurement has reduced price charged for goods purchased in public hospitals and to identify the extent to which e-procurement has ensured best value for money in public hospitals procurement. The study established that Kisii Level 5 hospital uses e-tendering, e - quotations and e- sourcing as the main e-procurement applications and that the greatest challenges faced when using e-market provider was inadequate funding, organization's inability to handle change management and lack of training of employees on how to use the system. The study concluded that public hospitals have adopted some of the e-procurement applications regardless of the challenges that accompany the adoption.

Rotich and Okello (2015) analysed use of e-procurement on performance of the procurement functions of county governments in Kenya. This study aimed at examining the relationship between e-procurement and procurement performance of County Governments in Kenya. The results revealed that e-procurement is positively related with performance of supply chain function of County Governments in Kenya. The study therefore recommended that the Government come up with policies on adoption of e-procurement practices and provide critical resources and leadership in adoption of e-procurement.

A study done by Basheka, Oluka and Mugurusi (2012) the adopting new approaches for public procurement efficiency: critical success factors (CSFs) for the implementation of e-procurement in Uganda's public sector confirm that in Uganda's context, the major CSFs for e-procurement include: careful involvement of suppliers; systematic risk management approaches; systematic redesign of organizational processes; use of experienced consultants; careful selection of software providers.

Gupta and Palmer (2003), using a survey of 168 US public and private sector organizations, indicate that e-Procurement technologies will become an important part of supply chain management and that the rate of adoption will accelerate as the adopters share their experiences of success factors and perceptions of low risk. Similarly, Barua, Konana, Whinston and Yin (2001) identified e-Procurement as the element of e-business most contributory towards the e-Business operational excellence of large corporations.

Wojciech and Zahir (2010) aimed to present electronic procurement benefits identified in four case Central Europe companies from the information technology (IT), hi-tech sector. Multi-case study design was applied. The benefits reported in the companies were analyzed and classified according to taxonomies from the information systems discipline. Finally, a new benefits classification was proposed. The framework was developed based on information systems literature. The research confirmed difficulties with benefits evaluation, as, apart from operational benefits, non-financial, intangible benefits at strategic level were also identified.

In another study, the extent to which organizations had plans to utilize electronic marketplaces for purchases was investigated. The survey was conducted in Norway. Survey results in dictate that most organizations had plans, only 3 percent had no plans (Petter and Anne, 2002) while 34 percent had concrete plans to utilize electronic marketplaces for purchases. Responding organizations planned to purchase significantly more indirect goods than indirect services on electronic marketplaces.

The main benefit expected from utilizing electronic marketplaces for purchases was reduced transaction costs. Strategic importance of business to business electronic markets can significantly predict the extent to which responding organizations and plans to utilize electronic marketplaces for purchases.

Conceptual Framework

In this study, the dependent variable was Efficiency frontier and the independent variable, e-ordering as illustrated in the Figure 1.

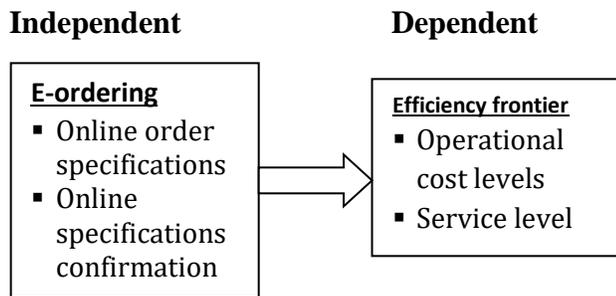


Figure 1: Conceptual framework

III. METHODOLOGY

Research Design

The study applied correlational research design. Both qualitative and quantitative approaches were used.

Target Population and sampling

The population of this study comprised all staff of Kakamega County Government involved in procurement or functions supporting procurement. The study adopted a census technique with respect to the unit of analysis which is the County Government of Kakamega because the population was small. The target population and sample is shown in Table 1.

Table 1: Population distribution

Category of respondents	Population
Senior Supply Chain Officers	10
Assistant Supply Chain Officers	30
Chief Officers	14
Accountants	50
Total	104

Reliability and validity

Pilot study was conducted to test the reliability and validity of the questionnaire. This was undertaken to test the reliability and validity of data collection instruments (Serekan, 2003). Expert opinion was sought on the data collection instruments and was provided by the University of Supervisors. This helped in validity check. The

instrument was pre-tested on 14 conveniently chosen respondents to check for reliability. Reliability test was ascertained through Cronbach's Alpha determination where a Cronbach alpha of 0.763 was obtained for the whole questionnaire. This compared against the threshold coefficient of 0.7 implied that the study questionnaire was reliable.

IV. FINDINGS AND DISCUSSIONS

The research sought to establish the profile of the respondents. This would ascertain their suitability in providing information for the study. Thus, duration served in the County Government, level of education and experience in procurement was explored. The findings are discussed in the subsequent sub-sections.

Period worked in the County Government

Respondents who had worked relatively longer in the county government were considered to be conversant with the operations of the county government thus were able to provide sufficient information regarding various aspects of e-Procurement. Findings on duration of service within the county government were presented to capture different category of respondents as well as the overall population as presented in Table 2.

Table 2: Duration Served within the County Government

Category of respondents	Duration served in the County Government				Total
	1 Year	2 Years	3 Years	4 Years	
Senior Supply Chain Officers	0.0%	11.1%	55.6%	33.3%	100.0%
Assistant Supply Chain Officers	3.4%	13.8%	65.5%	17.2%	100.0%
Chief Officers	0.0%	8.3%	16.7%	75.0%	100.0%
Accountants	6.3%	35.4%	43.8%	14.6%	100.0%
Total	4.1%	23.4%	48.0%	24.5%	100.0%

From the findings, majority of the respondents (48%) had served for three years in the County Government of Kakamega. A further, 24.5% had served the County Government for four years. This shows that the respondents had served for sufficient time in the county government considering that the county government has only been in place for five years. Thus the respondents could provide information on the procurement cycle of the County Government.

Education level of respondent

Education level of the study participants was probed to establish their ability to adequately respond to the questionnaire and interview items. Thus the respondents were as to indicate their level of education as primary, secondary or tertiary. Data was analysed and presented in Figure 2 to show percentage of each level.

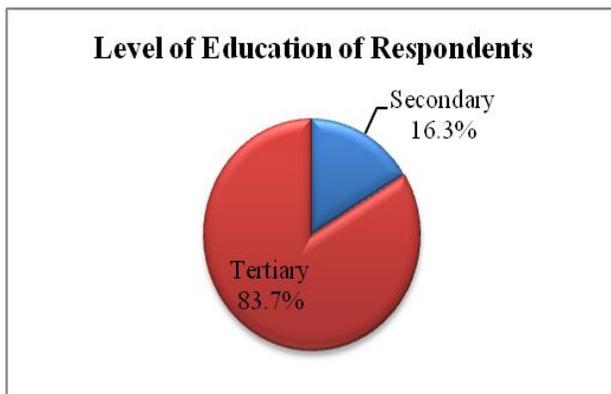


Figure 2: Respondents' Level of Education

The findings in Figure 2 show that out of the 98 study participants, the majority (83.7%) reported having tertiary education with only 16.3% reporting having secondary education. Crucially, there were no participants with only primary education. This shows that the participants had adequate education to respond to issues in the research thus provide information on the questionnaire and interview items.

Experience in procurement profession

With the core issue under research in this study being procurement, the researcher sought to establish the experience, in terms of years, the respondents had performed procurement functions. As such, the respondents indicated their years of experience where data was analysed and presented in frequency and percentages as shown in Figure 3.

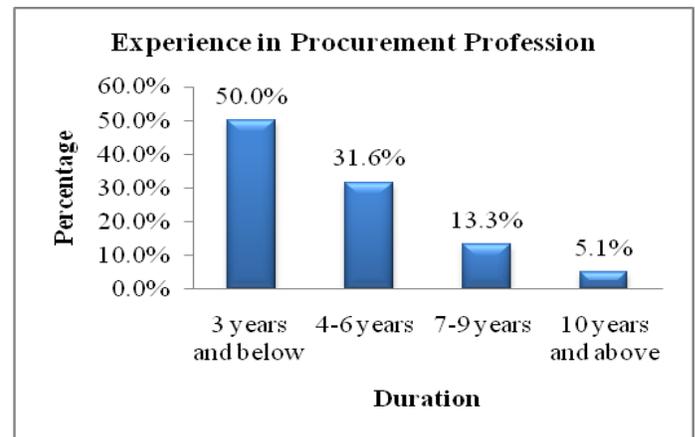


Figure 3: Experience in Procurement Profession

From the findings in Figure 3, majority of the staff involved in procurement in the County Government of Kakamega (81.6%) had worked in the procurement profession for less than 6 years. Specifically, 50% had served for 34 years and below. This shows that the staff lacked the requisite experience had this could affect their service delivery and hence affecting the efficiency frontier in performance of procurement function.

E-ordering in the County Government of Kakamega

In this section, the researcher sought to determine from the respondents the extent to which E-ordering activities was practiced within the County Government. Thus, the respondents were asked to rate four items based on how they perceived the organization to practice them. The

items were rated and scored on a five point scale as very low = 1, low = 2, moderate = 3, high = 4 and very high = 5. The results were analysed to show frequency and percentages of respondents favouring each response on each of the four items.

The researcher sought to determine the extent study participants agreed that the County Government of Kakamega has functioning websites to facilitate e-procurement. From the study findings as presented in Table 3, majority of the study participants (31.2%) said that this was to a low extent with another 23.4% saying it was to a very low extent. This shows that the availability of websites to facilitate e-procurement within the County Government of Kakamega was low and this might affect their efficiency in procurement. Similarly, during the interview with the Senior Supply Chain Officers and Chief Officers, it was found that integration of website to facilitate adequate application of e-

Similarly, majority of the participants (32.5%) reported that placing orders for supplies online within the County Government of Kakamega was to a low extent with a significant other 15.6% indicating that it was to a very low extent. The same view was shared with regard to defining order specifications online within the County Government of Kakamega where majority

The findings are presented in Table 3.

Table 3: *E-ordering practices within the County Government of Kakamega*

E-Ordering	EXTENT				
	Very High	High	Moderate	Low	Very low
Functioning website to facilitate e-procurement	(9.1%)	(11.7%)	(24.7%)	(31.2%)	(23.4%)
Placing orders for supplies online	(14.3%)	(10.4%)	(27.3%)	(32.5%)	(15.6%)
Defining order specifications online	(3.9%)	(9.1%)	(16.9%)	(37.7%)	(32.5%)
Specifications for procured items are posted to company website	(13.0%)	(18.2%)	(29.9%)	(20.8%)	(18.2%)

procurement in County Government of Kakamega was low, due to many challenges.

These findings support that of Kaliannan and Awang, (2008) who also documented that for any e-procurement initiative to be successful, there are a number of factors that an organization must critically consider. They include: user acceptance of new information system; information quality; trust; risk perception; early supplier involvement; staff training; users and buyers; compliance with best practices; top management support; continuous measurement of the key benefits; re-designing affected business processes and actual selection of e-procurement solution.

(37.7%) said that this was to a low extent while 32.5% said it was to a very low extent.

The researcher also sought to establish from the respondents whether the County Government of Kakamega post specifications for procured items on their websites. From the study findings presented in Table 4.3 above, majority of the study participants considered it to be moderate

that the County Government of Kakamega post specifications for procured items on their websites. They represent 29.9% of the total number of respondents who participated in the study. Further, 20.8% considered this practice to be to a low extent with another 18.2% perceiving it to be practiced to a very low extent within the County Government of Kakamega. The finding in this section shows less availability and reduced application of e-procurement platform and practices in e-ordering within the County Government of Kakamega.

This ultimately affects their efficiency in performance of the procurement function. Gerald and Joan (2009) also reiterate in the modern business state, for any business firm to succeed they must embrace and incorporate Information Technology into day-to-day running of the enterprise. Quesada, Gonzalez and Mueller (2010) also when investigating the impact of electronic procurement technologies on procurement practices (PPR) and procurement performance (PP), reported that the main benefit expected from utilizing electronic marketplaces

for purchases was reduced transaction costs and increasing efficiency of the organization.

V. CONCLUSION

The researcher sought to determine the extent study participants agreed that the County Government of Kakamega has functioning websites to facilitate e-procurement. The study therefore concluded that, the availability of websites to facilitate e-procurement within the County Government of Kakamega was low and this might affect their efficiency in procurement. In addition, placing orders for supplies online within the County Government of Kakamega was done to a low extent. There was also less availability and reduced application of e-procurement platform and practices in e-ordering within the County Government of Kakamega and this ultimately affects their efficiency in performance of the procurement function. However, in establishing the effect of E-ordering on efficiency in the County government of Kakamega, using regression analysis, the study concluded that there was a positive relationship between E-ordering and efficiency in the County government.

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