

CHALLENGES AFFECTING E-PROCUREMENT SYSTEM IMPLEMENTATION IN MURANG'A COUNTY GOVERNMENT.

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ABSTRACT

Electronic procurement involves aspect of transactional requisition, online authorizing, e-ordering, e-tendering and e-payment for goods or services. Purpose of this study was to assess challenges affecting E-procurement System Implementation in Counties Governments, Murang'a County. The objective of the study was to examine the effect of information technology infrastructure on the e-procurement system implementation, Murang'a County. The study is anchored on technology diffusion theory; Resource based theory and Technology disruptive innovation. The descriptive study design was adopted for the study. A census was conducted on all employees dealing with e-procurement system implementation in Murang'a County Government. The questionnaire was pilot tested to improve the instrument reliability. Cronbach Alpha coefficient with a value of 0.70 or above was considered to indicate that the instrument is reliable. Out of the 96 respondents, 90 respondent representing 93.8%. Collected data was analyzed using statistical package for social sciences. Inferential statistics was employed to test the degree of relationship among the variables with a confidence level at 95%. The study revealed that information technology infrastructure had a positive & statistically significant effect on E-procurement system implementation. The indication was information technology infrastructure for E-procurement system implementation has been a major challenge due to inadequate fund for acquisition of both computer hardware and software required for successful implementation of the system. In addition, inadequate ICT infrastructure, incompatibility of various ICT systems and lack of stable internet connectivity affected effective E-procurement implementation system. The study recommended that County government should focus on upgrading information technology infrastructure as a way to enhance E-procurement system. The study suggests that further study could look at the adoption level on E-Procurement systems in County Government.

Key Words: *Information Technology Infrastructure, E-Procurement System Implementation, County government*

INTRODUCTION

The public sector management nowadays is increasing in demand for transparent, efficient and effective in service quality (Ancarani, 2008). The advent of the internet, digital connectivity, the explosion and use of e-commerce and e-business models in the private sector are pressuring the public sector to rethink their hierarchical and bureaucratic organizational models (Corsi, 2006). Customers, citizens and businesses faced every day with new innovative e-business and e-commerce models implemented by the private sector and made possible by ICT (Information and Communication Technologies) tools and applications, are requiring the same from Government entities. E-Procurement is considered one of the major reforms in public sector procurement. E-procurement as the use of electronic methods over the internet to conduct procurement functions; identification of requirement, tendering process, payment and contract management (Corsi 2006). 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, 2009). 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).

With emergence of internet and information, communication technology (ICT) applications, business entities are strained to shift their operations from traditional way to the virtual e-business, e-procurement and e-supply chain philosophy (Lee, Ni & Koc, 2001). E-Procurement has been defined as 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 (Croom & Brandon-Jones, 2004). Local Authority Strategy for e-procurement report (2010) identifies the three areas where e-procurement implementation strategy in the public sector should be focused to ensure that the required practices, processes and systems are developed and rolled out in a consistent manner across the public sector. These areas are organization and management, practices and processes and systems and technology. I.T being essential as implementation of e-procurement since, it includes technology-based purchasing solutions aimed at simplifying commercial transactions for ordering, logistics and handling systems as well as for payment systems (van Weele, 2010). Traditionally procurement has been characterized by manual, paper based activities mainly in defining suppliers or vendors of materials or services purchased by an organization. However, as noted by Kiarie (2011) this has often resulted in inefficiencies, low transparency and low service quality as well as weak oversight roles, delays, poor linkages between procurement and expenditures, and poor record management. The information technology and e-procurement offers benefits for improvements in the public sector. According to PPDA (2015) e-procurement has the potential to strengthen the accountability, transparency, efficiency, and effectiveness of this sensitive, high-value government function.

According to (Soudry, 2007), 60% of information technology application in procurement initiatives and projects do not deliver the expected benefits. Despite the great benefits of e-procurement technologies, their implementation is still at their early stages (Aboelmaged, 2010). A variety of factors may affect a firm's decision to adopt and implement a particular ICT. In consolidating prior studies examining innovation, (Aboelmaged, 2010) classified variables that potentially influence ICT adoption and implementation into five broad categories: individual, task and innovation related, organizational and environmental characteristics. With the development of digital system, institutions have move operations from manual systems to online in order to sustain themselves (Oporo, 2014). The public sectors have moved to IFMIS system to acquire benefits in private company that have already achieved (Panayiotou, Gayialis & Tatsiopoulos, 2014). Therefore, e-procurement is no longer an afterthought but a necessity for any institution due to the dynamic and competitive business environment (Wangui, 2013). Due to ICT advancement, governments across the world have adopted e-procurement as a way to ease access to the information. E-procurement is the application of internet technology in works, material and service procurement. E-Procurement systems also allow more efficient integration of supply chains and provide better organization and tracking of transaction records for easier data acquisition (Ogot, 2009). In the last decade, Kenyan government has recognized the need to adopt ICT in service delivery to the public. This has gained momentum with the current Government administration. Existing literature reveals that a number of 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. There is however emerging evidence of the slow uptake of the technology despite the benefits that e-procurement offers (Segal and Taylor, 2001).

Statement of the Problem

The use of Electronic procurement having being a process that requires formation and restructuring in procurement procedures (Kosgey, 2014). The procedure requires electronic systems for demand estimation, budgets, sourcing, ordering and supply monitoring. Introduction of e-procurement in an organization is associated with increased efficiency, lower transactional costs, reduced corruption and

enhanced control and monitoring of public procurement process (Hunja 2011). Despite Government's sustained and incremental efforts in laying down infrastructure technology strategies in the area of E-procurement in order to boost transparency, efficiency and effectiveness in County governments, it is still apparent that the implementation of E-procurement is still very slow with only nineteen out of the forty seven counties had adopted the IFMIS System as at July 2014 (Pressutti, 2013). Heeks, (2014) observed despite massive investment by the government for implementation of e-procurement in county governments, 31% of the counties have totally failed in the implementation of e-procurement, 50% of the Counties have partially implemented, while only 19% of the counties have successfully adopted and fully implemented e-procurement systems. A number of organizations in Kenya have failed in implementation and the use of e-procurement technology (Gitahi, 2011). There are factors that influence the introduction of e-procurement on retail industry in Kenya and found that there is a lot of resistance to change (Orari, 2011). This history of implementation of e-procurement system since its introduction in Kenya in the year 2003 is riddled with a number of challenges which cannot be ignored. It is in light of this study that seeks to assess the effect of information technology infrastructure on the implementation of E-procurement system in Murang'a County.

LITERATURE REVIEW

Theoretical framework

According to Batenburg (2007) the organizational decision to adopt a new system such as electronic-procurement is usually taken by top management who take information about both the alternatives and the consequences into account. Nonetheless, the adoption decision neglects important issues such as user acceptance of e-procurement system (Byans Rue 1997). This study provides a theoretical framework for examining the readiness of e-procurement implementation by procurement entities in Murang'a County by; Technology Diffusion,-based theory and Disruptive innovation theory (Barahona and Elizondo 2012).

Technology Diffusion Theory

Technology diffusion theory is defined as the process by which an innovation is adopted and gains acceptance by individuals or members of a community. Technology revolution has impacted on purchasing, the drivers for change in purchasing function must include the objectives of eradicating paper transactions to a secure system that facilitates procure to pay as an objective of a world class procurement which is seen to enhance the performance of the procurement function (Lysons & Farrington, 2012). The Technology Diffusion theory is important in guiding the organization to initiate change and adopt technologies in procurement in the shift towards E-procurement.

The study thus used this theory to assess challenges affecting implementation of E-Procurement systems in County Governments, Murang'a County.

Resource-Based Theory (RBT)

According to Lambert (2005), Resource based theory states that a competitive advantage for a firm can be coined on its resource base. The resources of the organization go beyond finances and materials to encompass methods and processes (Ndunge, 2016). The internal capacity of an organization matters a lot and when an organization has requisite resources, it has capacity to innovate and deal creatively with arising challenges in the market. The application of Information Technology is crucial in supply chain management and procurement (Pressutti, 2013). According to Caridi, Crippa, Perego, Saianesi, and Turmino, (2010), Information Technology can be measured as economic asset that is derived from strategic resources. Bales and Fearon (2016), view E-procurement as sustainable resources upon which because it is unique, scarce, valuable, cannot be imitated, and are non-substitutable. Further, Percy and Guinipero (2008) reiterate that RBT is based on the concept that the resources controlled by firms are different and relatively immobile. In this study, e-procurement was viewed as an approach that optimizes use of available resources to enhance efficiency and effectiveness in procurement and hence deliver a competitive advantage. The competitive advantage in this case manifests in terms of improved lead times, cost efficiency and customer satisfaction. The study thus used this theory to assess challenges affecting E-Procurement system implementation in County Governments, Murang'a County.

Disruptive Innovation Theory

Barahona and Elizondo (2012) discussed the theory of disruptive innovation. This theory points out that e-procurement is an innovation. As such it requires continual improvement. Because of such improvements, it disrupts the normal procurement operations and processes. The theory of disruptive innovation is characterized by: small and costly client base and non-attractiveness at the initial stages of implementation, some level of acceptance as the system is implemented, new competition as innovation continues and continuous quality improvement to improve adaptability to user and stakeholders needs. Disruptive innovations require critical resources, processes and values. Critical resources include resources supporting the normal business activities such as; People, technologies, product designs, brands, customer and supplier relationships, relationship management with its clients and suppliers and marketing activities. Critical processes include decision making protocols and coordination patterns that supports operations of an existing business operations.

Empirical Literature

The dependent on availability of infrastructure to support the process. These include computers and servers. According to Wyld (2009), implementing of e-procurement is hampered by inadequate technical infrastructure in an entity as well as by partners. Information Technology (IT) is a technology that involves use of computers, software and internet connections infrastructure for supporting information processing and communication functions (Crompton 2007). The use of information technology in public sector has not been effectively implemented since most of the procurement functions are subjected to manual procedures that are slow, inaccurate and ineffective.

Technological resources have been consistently identified as an important factor for successful information systems adoption (Mambo, Ombui & Kagiri, 2013). Organizations adopt new technologies to improve the efficiency and effectiveness of various work processes, unfortunately, many technology-based products and services never reach their full potential, and some are simply rejected (Burton-Jones & Hubona, 2006). Failed investments in technology may not only cause financial losses, but also lead to dissatisfaction among employees (Venkatesh, 2010).

In 2009, PPOA acknowledged that there is no enough technology in place to enable the government to take all advantage of internet commerce. It identified issues such as identification of parties in a transaction, synchronization, confidentiality, data confidentiality and bandwidth as the major considerations that the government had to consider before taking full advantage of the benefits of E-procurement. Golder (2007) asserts that organizations that fail to integrate procurement functions with information communication technology systems like electronic data interchange employs manual procurement procedures that are inefficient and ineffective and leads this to wastage of procurement funds since the procurement processes are characterized by a low degree of transparency. According to Ken (2007), IT has reached almost every aspect of procurement and may enhance and deepen the effort of procurement reform. Specifically, information technology promotes economy and efficiency, significant savings of public funds by increasing competition, transparency by making procurement information of all sorts such as bidding opportunities, bidding documents, notices, texts of applicable rules readily available and in diminishing the opportunities for discretion and public confidence in the integrity of government procurement. Handfield (2009) study found out that integration of procurement functions with ICT has enabled many public organizations to improve the level of effectiveness in the execution of procurement practices. A study by Sanjeeve (2009) found that implementation of ICT based procurement methods in many public organization in Africa is hindered by lack of e-procurement methods, lack of automated procurement systems, lack of supportive ICT infrastructure and absence of ICT skills amongst procurement staff.

A study by Oyugi (2010), notes that lack of supportive ICT infrastructure and absence of ICT skills amongst procurement staff greatly affect the implementation of effective e-procurement practices in public organization in Kenya. An institutions technical competence is a strong enabler for adoption of Information Technologies as it forms a basis upon which such initiatives are built (Gibbs, & Kraemer, 2014). The external technologies comprise factors such as availability of internet service providers,

power supplies and security. Dai and Kauffman (2008) argue that Internet-based e-procurement systems and electronic market solutions need to be compatible to the greatest possible extent with the existing technologies, to have a reasonable chance to be widely adopted. Talluri, (2006), identified internal business risks arguing that implementing an e-procurement solution not only requires that the system itself successfully performs the purchasing process, but it integrates with the existing information infrastructure. PPOA Interim Report (2009) highlighted strategies to establish e-procurement in entire public firms in the country as means of cutting on corruption and shortening delays in tendering.

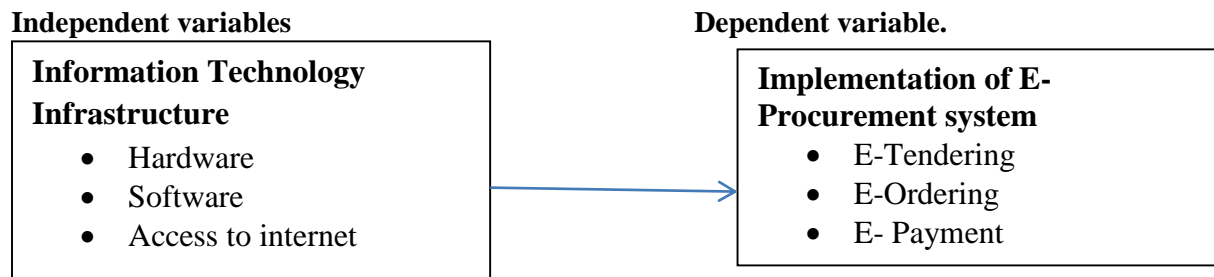


Figure 1: Conceptual Framework

RESEARCH METHODOLOGY

Research Design

The study adopted a descriptive research design. Research design is a general plan or strategy for conducting a research study to examine specific testable research questions of interest (Lavrakas, 2008). According (Saunders, Lewis, & Thornhill, 2009) indicate that a descriptive research design give a picture of a situation the way it is without any manipulation of existing variables. Descriptive study was chosen for this study since it enabled the researcher to involve both qualitative and quantitative techniques of data analysis (Mugenda & Mugenda 2009). The study engages the respondents in assessing the challenges affecting e-procurement system implementation in County Governments.

Target Population

Target population refers to all members of a real or hypothetical set of people, events or objects to which a study wishes to generate results (Dawson, 2009). The target population for this study include employee working in the procurement department, Store departments, finance departments and ICT department in Muranga County Government. The County has 96 employees involved in the implementation and direct use of e-procurement system. A census of all the 96 employees was done. Mugenda (2009) recommend a census when the target population is small. This involves gathering information from every member of the staff in the target population. This method is considered appropriate because it reduces the biasness in research.

Data Collection Instruments

The study employed self-administered questionnaires for data collection. According to Berkley (2005) a questionnaire is easy to administer and reduce bias since the researchers' own opinions was not influence the respondents to answer questions in a certain manner unlike if it were telephone or face to face surveys.

Reliability of Research Instruments

Claire et al. (2006) define reliability as a measure of the degree to which a research instrument yields consistent results after repeated trials. The reliability of the instruments was established through a pilot study. Test-retest technique of reliability testing was then employed whereby the pilot questionnaire was administered to the respondents twice. The study used the Cronbach's alpha to determine the reliability of the instrument. A Cronbach's alpha of 0.7 and above was taken as acceptable reliability according to Leedy and Ormrod (2005). The researcher also ensured content validity by consulting the supervisors in the department of business who are well-informed and experienced in research procedures. According to Mugenda and Mugenda (2003), validity of an instrument is improved through expert judgment.

Data Analysis and Presentation

Data analysis is the process of organizing the collected data in a way that meaningful conclusion can be drawn (Oso and Onen (2005). The study organized the data to ensure that the raw data is edited to free them from inconsistencies. This involves the scrutiny of the completed instruments in order to detect and reduce as much as possible, errors, incompleteness, misclassification and gaps in the information obtained from the respondents. SPSS version 22.0 was used to ease analysis of data. Inferential statistics, in form of Pearson correlation coefficient, bivariate regression analysis and ANOVA was used to measure the relationship between variables. The study used a 95% confidence level to evaluate the significance of variable.

FINDINGS

Response Rate

Data that was analyzed was obtained from ninety (90) respondents out of the targeted ninety six (96) employees of Murang'a County government. Thus the response rate was achieved at 93.8% which was very good according to (Mugenda & Mugenda, 2003).

Work Experience of the Respondent

The researcher sought to understand how long the respondents had worked in Murang'a County Government. The researcher considered this information relevant given that the longer the period they had worked, the more familiar they would be able to rate the challenges affecting E-Procurement system implementation in Murang'a County Governments. As shown on Figure 4.3 below, majority of the respondents are experienced due to their long service in the Murang'a County Government with 53.7% having worked for more than five years. In this case, given that more than 50% of the total respondents had more than three years in service, it is expected that the respondents had in-depth information regarding the challenges affecting E-Procurement systems implementation in Murang'a County Governments and would be able to rate the variable under consideration effectively.

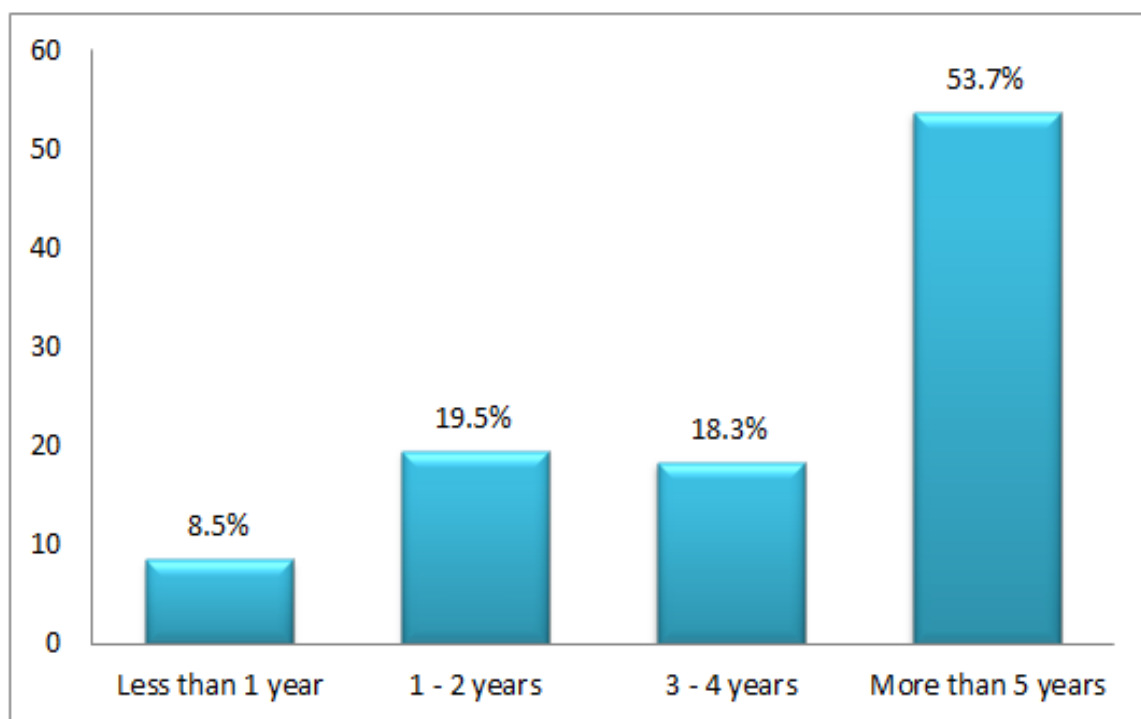


Figure 2: Work Experience of the Respondent

Descriptive Analysis of Study Variables

The third objective of the study sought to assess the effect of Information technology infrastructure on the implementation of E-procurement system in Murang'a County. Descriptive statistics were done to determine the effect of various factors of Information technology infrastructure.

Table 1 Descriptive Analysis of Information Technology Infrastructure

Information Technology Infrastructure Factors	N	Mean	Std. Error	Std. Dev
Inadequate ICT infrastructure, in compatibility of various ICT system and lack of internet in Murang'a county offices has been the major challenge towards adoption and implementation of E-procurement system	90	4.2778	.04748	.45041
Incompatibility of E-procurement with other ICT modules used in the County offices has slowed its adoption	90	4.0333	.01903	.18051
E-procurement system is compatibility with other County ICT systems and infrastructure	90	3.2556	.04623	.43862
Internet access services has been provided for in the County government offices	90	3.2444	.08842	.83882
The current ICT infrastructure is well managed to support day to day application of E-procurement	90	2.2778	.06893	.65390
Murang'a County offices has adequate IT Infrastructure to support successful implementation of E-procurement system	90	2.2444	.06944	.65875
Valid N (listwise)	90			

Results on Table 4.5 show that major challenge towards adoption and implementation of E-procurement system are inadequate ICT infrastructure, in compatibility of various ICT systems and lack of internet with a mean score of 4.2778 and standard deviation of 0.45041. Incompatibility of E-procurement with other ICT modules used in the County offices has slowed its adoption had a mean score of 4.0333 and standard deviation of 0.18051. E-procurement system is compatibility with other County ICT systems and infrastructure had a mean score of 3.2556 and standard deviation of 0.43862. Internet access services has been provided for in the County government offices had a mean score of 3.2444 while the current ICT infrastructure is well managed to support day to day application of E-procurement and Murang'a County offices has adequate IT Infrastructure to support successful implementation of E-procurement system had a mean score of 2.2778 and 2.2444. The finding of the study revealed that Murang'a County offices do not have adequate IT Infrastructure to support successful implementation of E-procurement system hence incompatibility of E-procurement system with other ICT modules used in the County offices has slowed its adoption. Crompton (2007), stated that Information Technology involves use of computers, software and internet connections infrastructure for supporting information processing and communication functions. According to Wyld (2009), implementing of e-procurement is hampered by inadequate technical infrastructure in an entity as well as by partners. Therefore Murang'a County government should embark on investing in information technology which involves acquisition of computers, software and internet connections infrastructure for supporting e-procurement.

Implementation of E-Procurement Systems

The study performed the trend analysis of the percentage yearly change in E- ordering, E-Tendering and E- Payment showing to show the proportional application of e-procurement system that was implemented successfully, not successful, pending and done manually. The findings of the study were as shown in Figure 3 and 4

E- Ordering

The trends indicated that high percentage of ordering was done manually with slight decrease from year 2014 to 2016. On contrary the percentage of ordering done electronically recorded a slight increase for the same period. On the same note the percentage of the orders not successful decreases. The percentage

of orders pending decreased in year 2015 and later had a slight increase from year 2015. The implication is that high percentage of ordering of goods and services was being done manually in year 2014 in Murang’a County Government but the trend has changed and the county has embrace e-ordering as shown by the increasing trend of ordering done successfully and decreasing trend of e-ordering done successfully as shown in Figure 3 below.

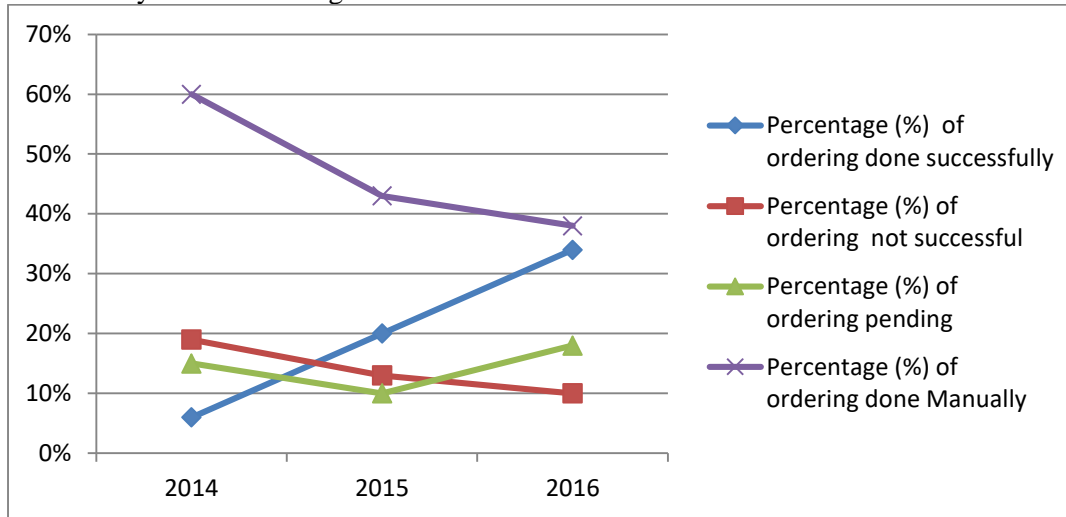


Figure 3: Trend analysis for application of e-ordering

E-Tendering

The trend analysis drawn indicates the annual decrease in percentage of the tendering done manually. There was slight increase in percentage of the electronic tendering done successfully. Compared to the year 2014, tenders not successful increased in the year 2015 but reduced by the year 2016 while tenders pending reduced in the year 2015 but increased in the year 2016. The implication is that high percentage of tendering of goods and services was being done manually in year 2014 in Murang’a County Government but the trend has changed and the county has embrace e-tendering as reflected by the increasing trend of ordering done successfully and decreasing trend of e-tendering done successfully as shown in Figure 4 below.

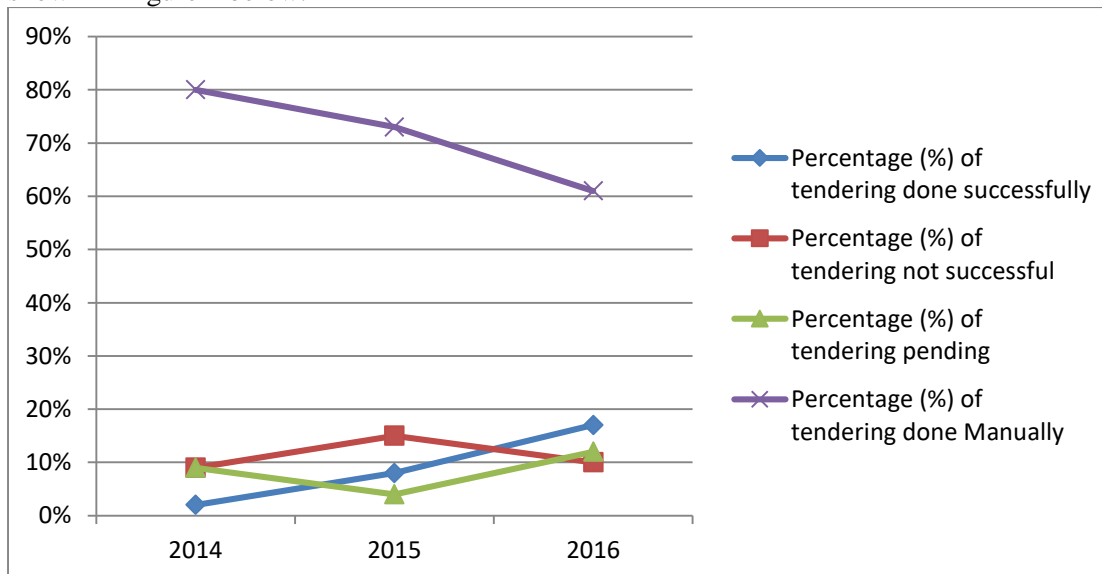


Figure 4: Trend analysis for application of e-tendering

Regression Analysis

The bivariate linear regression analysis results of information technology infrastructure on the implementation of E-procurement system were as shown in Table 2. The analysis indicates positive and significant relationship between information technology infrastructures on the E-procurement system

implementation in Muranga County Government. R value was 0.794 while R squared (R^2) value of 0.630 shows that 63.0 percent of the implementation of E-procurement system is explained by information technology infrastructure. Bivariate regressions indicated that information technology infrastructure had positive and significant effect on implementation of E-Procurement systems with $\beta = 0.736$ at p value 0.000 which is less than 0.05. From Table 2, the bivariate linear regression model equation fitted using unstandardized coefficients is; $Y = 1.090 + 0.736X_1 + e$ where 1.090 is the constant and X_1 is information technology infrastructure index.

Table 2 Regression Output

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.090	.219		4.983	.000
1 Information technology infrastructure	.736	.060	.794	12.237	.000

R = 0.794, $R^2 = 0.630$, Adjusted $R^2 = 0.626$, Std Error = 0.219, F = 149.733 and Sig = 0.000

a. Dependent Variable: implementation of E-Procurement systems

DISCUSSION

The study explored the relationship between information technology infrastructures on the implementation of E-procurement system in Muranga County Government. The finding of the study revealed that information technology infrastructure had positive and statistically significant influences on implementation of E-Procurement systems in Muranga County. It also means that an increase of one unit of information technology infrastructure increases implementation of E-Procurement systems by 0.736. The indication was that information technology infrastructure is a major factor that affects implementation of E-Procurement systems. The finding of this study supports Mambo, Ombui & Kagiri (2013), who noted that technological resources have been consistently identified as an important factor for successful information systems adoption. According to Burton-Jones & Hubona (2006), organizations adopt new technologies to improve the efficiency and effectiveness of various work processes, unfortunately, many technology-based products and services never reach their full potential, and some are simply rejected. Oyugi (2010), noted that lack of supportive ICT infrastructure and absence of ICT skills amongst procurement staff greatly affect the implementation of effective e-procurement practices in public organization in Kenya.

CONCLUSION

The objective of the study sought to assess the effect of Information technology infrastructure on the E-procurement system implementation in Murang'a County. The overall result derived from regression analysis at 95 percent confidence level indicated a positive and statistically significant relationship between information technology infrastructure and implementation of E-procurement system. Descriptive statistic further indicated that the major challenge towards adoption and implementation of E-procurement system are inadequate ICT infrastructure, incompatibility of various ICT systems and lack of stable internet connectivity. In addition, the study revealed that Murang'a County offices do not have adequate IT Infrastructure to support successful implementation of E-procurement system. It was evident from the study that County Government budget to support implementation of E-procurement system is not sufficient. In addition, computer hardware and software were found to be inadequate. The study concludes that effectiveness of the e-procurement system is dependent on availability of financial resources in order to meet such technological costs as software and hardware. Information technology infrastructure had positive and statistically significant effect on implementation of the E-procurement system in Murang'a County. The study concludes that the major challenge towards adoption and implementation of E-procurement system are inadequate ICT infrastructure, incompatibility of various ICT systems and lack of stable internet connectivity.

RECOMMENDATIONS

Information technology infrastructure was also found to be a major challenge towards adoption and implementation of E-procurement system. These relates to inadequate ICT infrastructure, incompatibility of various ICT system and lack of stable internet connectivity. Following these findings, this study recommends that County government should focus on upgrading information technology infrastructure in order to enhance implementation of the E-procurement system.

AREAS OF FURTHER STUDY

This study makes an important contribution in our understanding that information technology infrastructure are the main challenge affecting implementation of E-Procurement systems in Murang'a County Governments. Future researcher could undertake a study focusing on the adoption level of E-Procurement systems in County Government. Future researchers may also adopt a case study research design for other Counties which would further add value in understanding the challenge affecting implementation of E-Procurement systems.

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