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ROLE OF E-PROCUREMENT PROCEDURES ON SUPPLY CHAIN PERFORMANCE IN GOVERNMENT MINISTRY: A CASE STUDY OF MINISTRY OF LANDS KISUMU

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Abstract: **E-procurement implementation in public procurement is considered as one way of enhancing efficiency and effectiveness within their supply chain management. However, notwithstanding the benefits of e-procurement, government ministries and departments in Kenya, particularly ministry of lands, housing and urban development Kisumu County have been slow in integrating e-procurement procedures within their procurement operations due to various challenges. The study sought to establish the role of e-procurement procedures on supply chain performance in ministry of lands Kisumu County. The study was guided by these specific objectives; to establish the level of e-procurement adoption and implementation at Kisumu county lands office, to establish how use of ICT has enhanced e-procurement integration within supply chain performance at Kisumu County Lands office, to determine how organizational factors affect supply chain performance in relation to Kisumu county lands office and finally to evaluate the forms of e-procurement on the supply chain performance at Kisumu county lands office. The study was based on the following theories; Technology Acceptance model theory, Diffusion theory, Diffusion of Innovation theory and lastly Network effect theory. The study adopted descriptive survey research design. The target population was 300 employees at county lands office in Kisumu who comprised senior staff, procurement personnel, other members of staff and members of public coming to transact at the office. Out of these, a sample of 174 respondents was selected to give response to the study. A structured questionnaire was used to gather primary data. To test validity and reliability the questionnaires were pilot tested before being issued to the respondents. Quantitative method of data analysis was used to analyze the collected data which was analyzed using descriptive statistics software using SPSS version 21.0 for generation of descriptive statistics as well as inferential statistics. The study concluded that E-procurement adoption, use of ICT in procurement, organizational factors and forms of e-procurement have a positive effect on supply chain performance in ministry of lands Kisumu County. It therefore recommends that a flexible e-procurement operational system should be adopted through proper research to effectively help any organization and business entities fulfill their ever changing needs and also help in dealing with challenges that may arise from a dynamic global business setting. The study therefore recommend that decision makers and other senior management should support and implement suitable e-procurement systems backed by communication infrastructure tailored to their operations. They should also partner with service providers, adopt the right ICT tools and training of staff on the use of the systems. However, proper need identification should be undertaken to ensure appropriate software and the right external partners are sourced to enable a cost effective e-procurement implementation within government ministries.**

Keywords: **Supply Chain Performance, E-procurement Adoption, Organizational factors, Forms of e-procurement.**

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I. INTRODUCTION

E-procurement is the use of public funds by a procurement entity normally ministry, state departments or agencies to acquire goods, services and works. The electronic government is a process of transformation where the helping tool is technology (Almarabeh & AbuAli, 2010). The potential of e-government within government operations particularly supply chain performance depends on the level of information communication technologies (ICT) exploitation. E-procurement is one of the ways of improving efficiency and effectiveness of government departments within their supply chain management. In Kenya, the government is the leading provider of essential services such as health, education, defense and infrastructure (Odhiambo & Kamau, 2003). This is mainly done through procurement function, making it paramount, and the sheer magnitude of procurement outlay has a significant impact on the economy and needs to be well managed (Ogachi, 2011).

E-procurement (sometime known as supply exchange) is the business-to-business (B2B) or business-to-customer (B2C) or business-to-government (B2G) purchase and sale of supplies, works or services through the internet as well as through other information networking systems such as Electronic Data Interchange (EDI) and Enterprise Resource Planning (ERP) (Baily, 2008). Typically, e-procurement websites allow qualified and registered users to look for buyers of goods and services, (Lindskog, 2004). Government departments which have implemented e-procurement are using the platform to invite bids and purchase required supplies through e-procurement. They also update tenders and request for qualifications to suppliers, status of tender evaluation and award can also be accessed by the contractors and suppliers. This is aimed at increasing the integrity and transparency of the prequalification tendering processes (Noor & Mohemad, 2010).

The Ministry of Finance Strategic Plan (2010-2014) shows that the government spends approximately 70% of the national budget on procurement activities. The total expenditure for the financial year 2012/2013 was estimated to be 76.6%, equivalent to 895 billion Kenya shillings of gross estimates. The budget in 2013/2014 was Ksh1.6 trillion, which means that the government procurement spending was slightly over Ksh.1 billion (Odhiambo & Kamau, 2003).

The technologies enabling e-procurement range from commonly available communication tools, such as email, to more complex systems such as e-market places, or enterprise resource planning (ERP) systems (Abu-Elsamen, Chakrabory & Warren, 2010; Teo, Lin, & Lai, 2009). E-procurement may involve diverse range of functionalities such as searching for suppliers of goods and services by using general or specialized search engines (Teo et al., 2009). Here information can be sought and feedback gotten by communicating with the sellers and vendors via e-mails and feedback gotten without necessarily both parties having to incur cost of transportation to sample or inspect items before they are purchased from the suppliers' warehouses.

Global Perspective of E-Procurement Procedures:

From a global perspective, competition and procurement practices changes especially in information and communication with internet technologies making competition knowledge-based thereby affecting supply chain performance across firms Worldwide. The effective management of global customers and suppliers, the development of e-procurement practices has expanded the market where buyers are able to carry out transactions globally (Kähkönen, Lintukangas & Virolainen, 2013). A stronger emphasis on e-procurement as a procurement practice in an organizational strategy may help supply managers to manage uncertainty better. Gunasekaran and Ngai (2008) on adoption of e-procurement in Hong Kong stated that internet increases interactivity and lead to more efficient procurement processes, greater control and help to form a strong centralized procurement function within the organization.

Internationally, most procurement executives are unsure on how to implement e-procurement effectively in the supply chain performance. Based on a field study of 26 firms with business operations in Asia, Hsao and Teo (2005) suggested a three stage model for implementing e-procurement. Which stated as, assessment of e-procurement's match with your firm's purchasing practices. Secondly determine organization operational and strategic objectives and finally, overcoming key barriers most likely to discourage buyers and suppliers. Although e-procurement has many operational and financial attractions, these can only be realized if the ground has already been well prepared through the cultivation of facilitators and the elimination of all impediments such as; security breaches, cultural mismatch, non-participation by key suppliers and regulatory challenges (Trkman, McCormack, De Oliveira, & Ladeira, 2010). Corina (2011) has highlighted and discussed four major impediments to adoption of e-procurement as management barriers which come due to limited resources, resistance to change and information sharing. The second barrier is organizational barrier due to different

culture, different compatible internal and external post supplier relationship. The third barrier is IT barrier which is promoted by lack of common compatibility and finally user barriers namely; fear of change, lack of information skill system among the procurement and other staff within the organization.

In Turkey, Isikdag, Underwood, Ezcan, and Arslan, (2011) have explained that e- procurement provides opportunity for improving communication and coordination along with expanding marketplace for both suppliers and buyers. They however concluded that legal issues and lack of a legal infrastructure particularly rules and regulations to support e-procurement were a key barrier towards adoption of e-procurement within the Turkish AEC industry. Additionally, technological issues that were identified to also hinder adoption of e-procurement are related to security of information exchange and lack of re-engineering processes to facilitate the new way of procurement in which results indicated that the stakeholders within the Turkish AEC Industry continue to refrain from implementing e-Procurement.

According to Ramkumar and Jenamani (2012) adoption of e-procurement can be of two ways, one optional and the other mandatory from the law like in India as per Central Vigilance Commission Act which has made it mandatory for e-procurement in public sector organization. Since e-procurement is not core business for many organizations in that case three options are available. The first is to develop in-house, secondly use service provider and lastly to adopt both in-house development and engage service provider. Selection of service Provider Company should be based on main criteria's like technology, vendor base, technical competence, performance, flexibility of service, worthiness and reputation. Ramkumar and Jenamani (2012) further state that e-procurement is used by companies as a tool to reduce procurement costs, promote transparency in purchasing process and also is used to reduce procurement cycle time.

Local Perspective of E-Procurement Procedures:

Public procurement was seen to have been neglected for a long time and therefore the government was not realizing value for money amongst its ministries and other public state corporations. The neglect was said to have contributed to massive corruption involving state officers and suppliers of goods and services in government ministries. The unabated corruption saw Kenya through Transparency International, "Corruption Perception Index 2016" being ranked 145 out of 176 countries with the least corrupt country being at the top. This represents the level of perceived public-sector corruption on a scale of 0 (highly corrupt) to 100 (very clean) and Kenya had an index of 26 (Vilks, 2017). This necessitated the need to revamp public procurement where a number of reforms aimed at enhancing efficiency in the procurement process were initiated. Major reforms in the procurement system in Kenya started with the establishment of the legal framework within which public procurement could be carried out. One of them being the Public Procurement and Asset Disposal Act (PPADA) 2015 which came into effect in January 2016. The act requires public sector organizations like ministry of lands to implement e-procurement as part of its supply chain management. The other measure was the introduction of Integrated Financial Management Information System (IFMIS) aimed at implementing payment platform for all government ministries and department (Miheso, 2013).

Public procurement is considered to be very instrumental in the development of the Kenyan economy. Its importance has been on the increase since the year 2004 and 2014 where it accounted for 9% and 11% of the GNP respectively (Kamotho, 2014). Before the government formulated procurement laws under Public Procurement and Asset Disposal Act (PPADA) 2015, procurement function was underestimated and was not seen as critical to supply chain performance by organizations. Procurement was thus regarded as a mere clerical job subjected to procurement.

Public procurement is an important function of government (Thai, 2001) even though has been neglected area of study public practitioners are diligently working to improve public procurement practices. This is being boosted by Kenya institute of supplies management (KISM). KISM is public entity which draws its mandate from the Supplies Practitioners Management Act No.17 of 2007. This Act provides the legal framework within which the Institute is established and operates as a corporate body promoting learning, development of best practices, and application of the same to the practice of procurement and supply chain management. KISM is a national body for professionals in the practice of procurement and supplies management in Kenya,

The Kenya procurement system had proved to be long, cumbersome and time consuming. This procurement system had several deficiencies that contributed to huge losses in public funds (Mose, 2012). It has also proved to be costly for both buyer and supplier or organizations, besides being regarded as a perpetrator of corruption. According to Matunga, Nyanamba and Okibo (2013) adoption of e-procurement in Kenya was slow thereby not favoured by Kisii level 5 hospital despite the many benefits that comes with the implementation of it in supply chain performance.

Within the private sector, a research conducted into the benefits that can accrue from a successful e-procurement adoption identified the following benefits; enhanced relationship with suppliers, reduced order cycle times, reduced cost of orders, leads to streamlined supply chain and promotes greater compliance with standards (Doherty, McConnell& Ellis-Chadwick, 2013). Doherty et al., (2013) further agreed that public sector organizations might be encouraged to adopt e-procurement in order to reduce costs through e-tendering, e-award, e-contract and e-catalogue systems.

Despite all of the efficiencies that can be realized through e-procurement, the implementation of any e-government project is complicated because of the size and bureaucratic nature of government. Besides procurement process which includes selecting bidders, evaluating tenders and selecting contracts is expected to be transparent to the public. Governments are eagerly looking toward an e-government initiative; it is obstructed by the challenges faced in modernizing such vast enterprises like e-procurement (Devadoss, Pan, & Huang, 2003). 1.2 Statement of the problem

The purpose of the study was to assess the Role of e-procurement procedures on Supply chain performance within the public sector in Kenya with reference to Ministry of lands Kisumu. Traditionally the ministry has been undertaking supplier selection through the competitive bidding undertaken manually. The mode was engrossed with errors and delays to some extend affecting procurement functions as some contracts and documents especially the bulky contracts could either be incomplete from the ministry procurement officials' side or error may emanate from the contractors. This in essence gave undue advantage to some competitors and at the same time could have seen a given contract being shelved or date of opening the tenders postponed to allow the correction of any noted anomaly.

A number of studies have been done in the area of procurement in Kenyan context. For instance, Ondieki (2000) in his study recommended that manufacturing firms should borrow a leaf from those that have successful proactive procurement functions in place. However, the study did not show the benefits firms stand to gain by adopting proactive procurement practices. Kakwezi and Sony (2010) illustrated that procurement planning is an ingredient to service delivery, but the study focused on service delivery ignoring other measures of procurement like financial gains from cost reduction.

The study sort to make an in-depth assessment over the role of e-procurement adoption by government entities, a case study of ministry of lands Kisumu county office. There is growing demands for better, faster and efficient service delivery to the members of public who are the tax payers. Adoption of e-procurement at Kisumu land registry office has been hampered with numerous challenges which include delayed modernization of the land registry, cost element where resources are not available to invest in system integration, regulations and compliance of applicable laws. Another challenge is the lack of commitment from the top management where senior officers are engaged in competition which has been created by the fact that we have members of staff who initially before devolution were all under national government but not they have been separated into county government staff and national government staff all working in one office undertaking similar tasks. Eadie, Perera, Heaney and Carlisle (2007) only named e-procurement and e-tendering as the viable alternatives of traditional paper based procurement processes achieved through the internet. Government demands high procurement performance, efficiency and reduced cost in respect of supply and service cost to be reduced and one of the ways is e-procurement and hence, the importance supply chain performance. This has led to conflict of interest thereby affecting efficiency of supply chain performance and their dependability. The use of e-procurement procedures/technology as organization tends to streamline its supply chain performance is seen to front several challenges which the research seeks to investigate. Therefore, this study was undertaken to fill this existing research gaps by establishing the Role of e-procurement procedures in supply chain performance in Kenya with reference to Ministry of Lands, Kisumu.

Objectives of the Study:

General objective:

The overall objective of this research study is to determine the role of e-procurement procedures on supply chain performance at the ministry of Lands as a GOK entity.

Specific objectives:

The specific objectives of this study are:

1. To establish the level of e-procurement adoption and implementation at Kisumu County Lands County office.
2. To establish how use of ICT has enhanced e-procurement integration within supply chain performance at Kisumu County Lands' office.

3. To determine how organizational factors, affect supply chain performance in relation to Kisumu County lands office.
4. To evaluate the forms of e-procurement on the supply chain performance at Kisumu County lands office.

Research Questions:

The study seeks to answer the following questions:

1. What are the indicators of an effective e-procurement adoption and how it has improved supply chain performance in Ministry of Lands?
2. What are the challenges facing the use of ICT systems in e-procurement within MOL as a public entity?
3. How do organizational factors impact on supply chain performance at the Ministry of lands Kisumu County office?
4. What are the forms of e-procurement supporting supply chain performance?

2. LITERATURE REVIEW

E-procurement Adoption:

To determine the role e-procurement procedures on supply chain performance within government ministries, the study adopted Technology Acceptance Model theory.

Technology acceptance Model theory:

Technology acceptance model (TAM) theory is among the models that have gained attention and confirmation in a wide array of areas and applications to understand end user's intention to use technology and systems. The primary constructs for capturing consumer acceptance of e-commerce are the intention to transact and online transaction behavior by the use of TAM variables namely, perceived usefulness and ease of use (EOU). The practical utility of TAM stems from the fact that its application is technological based (Pavlou, 2014). TAM was initially developed by Davis et al. (1989) who argue that computer systems cannot improve organizational resistance to end user systems by managers and professionals thus paving a wide spread problem. To better predict, explain and increase user acceptance we need to understand why people accept or reject computers. TAM links perceived usefulness and EOU to a person's attitude towards a system. With the increased use of wireless technology, existing security mechanisms designed for wired networks have to be redesigned to guard against intrusion and unauthorized access in order to maintain technological integrity (Hwang et.al, 2003).

Attitude in TAM is influenced by two key elements determining technological behavior; perceived ease of use (EOU) and perceived usefulness (Venkatesh, 2000). Davis 1989 defined perceived usefulness as the degree to which "a person believes that using the system will enhance his or her performance" and EOU as the degree to which "a person believes that using the system will be free of mental effort".

According to TAM, perceived usefulness and EOU both affect a person's attitude toward using the system, and consistent with these attitudes toward using the system determine behavioral intentions, which in turn lead to actual system use. Is one of the most widely used theories in IS literature. Two beliefs (perceived usefulness and perceived ease of use) predict attitudes, which in turn influence intended use of a technology, (Venkatesh, 2000). This intention then consequently impacts behaviour of actual system usage. Perceived usefulness is the degree to which a user thinks a technology would enhance performance or productivity in the workplace. Perceived ease of use is the degree of lack of effort required by the user in adopting a given technology. Some users perceive TAM to pose potential risks from immature technology,(Wu, & Wang, 2005) thereby affecting its perceived usefulness.

TAM models how users come to accept and use a technology. It distinguishes two concepts. First, the perceived usefulness reflects the expected benefits from using a certain technology. Second, the perceived ease of use reflects pretty much the same thing as the perceived behavioral control in the theory of planned behavior.

Use of ICT in e-procurement:

To determine the role e-procurement procedures on supply chain performance within government ministries, the study adopted Diffusion theory.

Diffusion Theory:

Information Communication Technology (ICT)systems cannot be effective unless they are used. However, people sometimes do not use systems that could potentially increase their performance. The study applied Diffusion theory (Rogers, Singhal, & Quinlan, 2014).Defines Diffusion theory as the process by which an innovation is communicated through certain channels over time among participants in a social system. The theory seeks to explain how, why, and at what rate new ideas and technology spread through culture. Rogers further describes the innovation-decision process as an information-seeking and information-processing activity, where an individual is motivated to reduce uncertainty about the advantages and disadvantages of an innovation. The innovation decision process involves five steps: knowledge, persuasion, decision, implementation, and confirmation. The innovation-decision process starts with the knowledge stage during which an individual learns about the existence of innovation and seeks information about the innovation. This phase asks "What?" "How?" and "why"? During this phase, the individual attempts to determine "what the innovation is and how and why it works". According to Rogers, the questions form three types of knowledge: awareness knowledge, how-to-knowledge, and principles-knowledge. The persuasion step occurs when the individual has a negative or positive attitude toward the innovation, but the formation of a favorable or unfavorable attitude toward an innovation does not always lead directly or indirectly to an adoption or rejection. The individual may shape his or her attitude after he or she knows about the innovation. Furthermore, he states that while the knowledge stage is cognitive-(or knowing-) centered, the persuasion stage is more affective-(or feeling-) centered. Thus, the individual is involved more sensitively with the innovation at the persuasion stage. The degree of uncertainty about the innovation's functioning and the social reinforcement from others (colleagues, peers, etc.) affect the individual's opinions and beliefs about the innovation. At the decision stage in the innovation-decision process, the individual chooses to adopt or reject the innovation.

Diffusion theory highlights five factors that determine the speed at which innovations are adopted by members of a social system(Thakadu& Tau, 2012). Which includes; perception of innovation, type of innovation decision, communication channels, characteristics of the social system and promotional strategies.

Procurement planning is defined as the purchasing function through which organization obtain products and services from external suppliers (African Union,2003). A good procurement plan will go one step further by describing the process you will go through to appoint those suppliers contractually. Whether you are embarking on a project procurement or organizational procurement planning exercise, the steps will be the same. At first, define the items you need to procure. Secondly define the process for acquiring those items and finally schedule the timeframes for delivery.

Organizational Factors:

To determine the role e-procurement procedures on supply chain performance within government ministries, the study adopted Diffusion of Innovation Theory.

Diffusion of Innovation Theory:

Organizations use information adoption systems in their operations systems which include diffusion of innovation (DOI) theory. DOI theory describes the process of spreading innovation via communication channels over time among the members of a social system (Rogers, Singhal& Quinlan, 2014). The four key elements in the diffusion theory are innovation, defined as idea/practice, or object that is perceived as new. The second element is, communication channels which entail the means by which messages and information is conveyed from one individual to another. The third element is time. Time is of essence as it determines how the message is sent and received without delay since time may be a hindrance in communication. Where time has not been factored in e-procurement planning may be disrupted since the organization may not be able to initiate procurement activities or even have tenderers submit quotations way after the stipulated time. The final key element is social system, defined as people or groups of people engaged in the innovation adoption process.

Roger's theory details the stages of innovation decision process (knowledge, persuasion, decision, implementation and confirmation). The theory suggests pertinent attributes of innovation. That is relative advantage, compatibility, complexity, try ability and observability. Additionally, the theory suggests the major category of adopters as innovators, early adopters, early majority, late majority and laggards. The category of an adopter and innovation affect the rate of adoption. The members of a social system, the potential adopters, could be individuals, informal groups or organizations. DOI theory suggests that organizational structure such as centralization, complexity and formalization and organizational openness to link to other organizations affect the rate of adoption.

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E-procurement is the practice of using information technology inter-organizational context therefore the adoption and use of e-procurement alongside technology and organizational context requires a highly relevant environmental context. DOI theory explicitly targets explaining technology adoption and addresses of the three contexts (technological, organizational and environmental context) which prompted Kuckertz & Breugst, (2009), Prescott, (1995) and Zhu et al (2006), to suggest that a combination of technological, organizational and environmental (TOE) context framework and DOI theory is a good starting point for formulating models of technology and adoption use.

Forms of e-procurement:

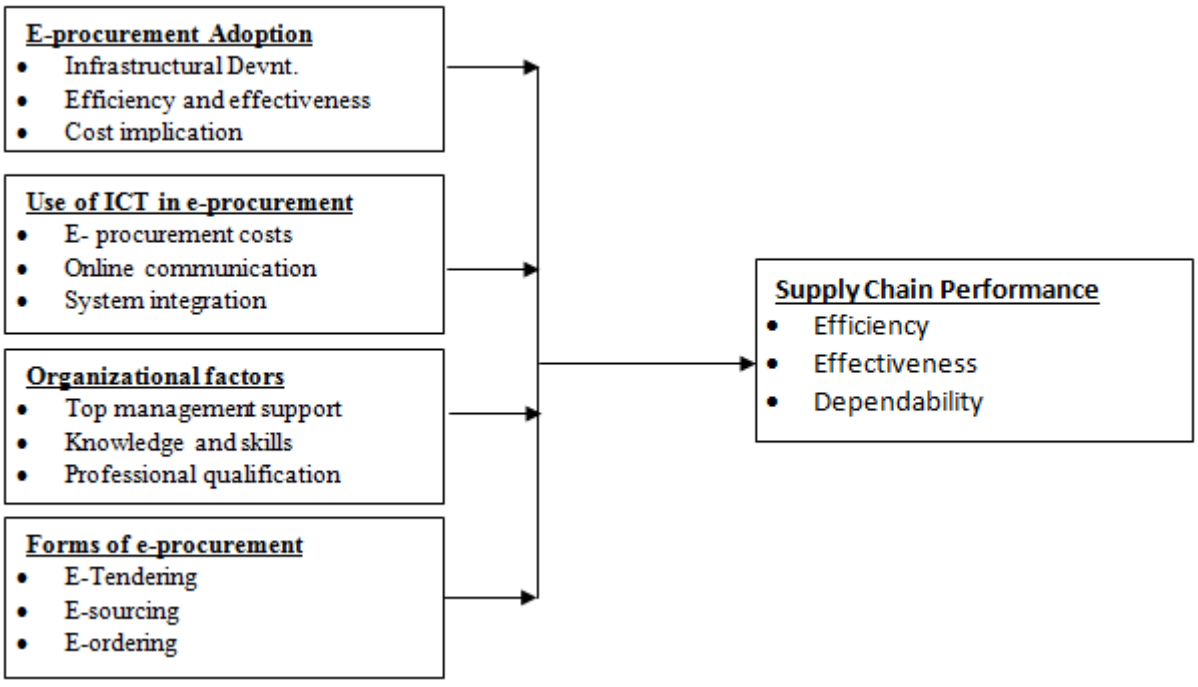
To determine the role e-procurement procedures on supply chain performance within government ministries, the study adopted Network Effect Theory.

Network effect Theory:

Network effect theory also referred to as network externalities or demand – side economies of scale suggest that the actions of a firm may depend on the collective actions of other firms (Chwelos, Benbasat & Dexter, 2001). Chwelos, Benbasat and Dexter, (2001) captures the level of such technological expertise within an organization. IT sophistication, therefore, should be regarded as one of the necessary conditions that contribute to the ability to integrate supply chains. The value of technology together with its network is dependent on the number of other users interacting with it. The size of the network that firms are using in a particular technology with network effects is affected by the benefits that adopters derive from the using the technology, while he benefits in turn depend on the size of the network. Examples of technology with network effect are e-mail and electronic data interchange (EDI).

Theories are imperative when it comes to the role of e-procurement procedures in supply chain within government ministries and in particular Ministry of Lands' Kisumu County office. The theories discussed herein are technology acceptance model (TAM) theory, diffusion theory, diffusion of innovation (DOI) theory and network effect theory. The theories are relevant to the study since technological systems, innovation and network effects are relevant in enhancing supply chain performance through e-procurement efficiency at Kisumu lands office. Successful implementation of the theories will not only enhance efficient paperless service delivery and procurement procedures run smoothly in the lands' offices but also will help the ministry to comply with regulation to implement e-procurement.

Conceptual Framework:



Independent variables **Dependent variable**

Empirical review of the study:

E-Procurement Adoption:

The business environment of the 1990s has been characterized by increasingly technological complexity, demanding markets, explosion of knowledge and increasing global competition (Rycroft & Kash, 2004). When organizations improve on their procurement procedures, benefits associated with e-procurement may be realized,(Puschmann, & Alt, (2005).As firms and mainly government ministries continued to focus on reducing returns costs basing on the exchequer allocation, they reached the point of diminishing returns within their own boundaries and started to realize that better coordination across corporate boundaries- inter ministry cooperation with suppliers and distributors presented greater opportunities.

According to Rycroft and Kash (2004), networks are those linked organizations (eg. Firms, universities, government agencies) that create, acquire and integrate the diverse knowledge and skills required to create and bring to the market complex technologies. Adhering to the set out procurement regulations by Public Procurement and Disposal Act 2015, which establishes procedures for the efficient public procurement and the disposal of unserviceable items, obsolete, or surplus store, assets and equipment by public entities and to provide for other related matters.

Procurement entities are responsible for carrying out all the procedures pertaining to the complete procurement cycle. Complete procurement cycle ensures that there are effective management procedures in place to properly manage each step. (Public Procurement Oversight Authority, (PPOA) 2009).There is need for the procurement regulator to gain acceptance by various ministries for it to be implemented with ease (Agaba, & Shipman, (2007).

Modern day procurement managers manage procurement and sourcing function both at strategic and operational levels. They may also require purchasing upgrades in terms of employee skills and capabilities (Das, Narasimhan, & Talluri, 2006).They are proactively engaged in building supplier networks, estimating, controlling and reducing costs besides performing cross functional together with supply chain and manufacturing functions. According to KPMG (2012), the functions are; to ensure the consistent and optimized management of the purchasing processes, to analyze and provide the necessary business information for decision making, to implement e-procurement procedures and systems integration with suppliers, to manage the vendor selection and evaluation systems and to promote innovation in the procurement function. According to Stevenson and Hojati (2007), tight control of inventory items may yield savings in ordering, packaging, shipping costs from same suppliers. This may be practical when inventory cannot be closed monitored.

Firms are competing in a global economy and thus the unit of business analysis is now the world, not just a country or region. The communication revolution and globalization of consumer culture will not tolerate hand-me-down automotive designs or excessive delivery times. Gupta and Barua (2016) states that, as firms globalize, they realize that no matter how large they are, they lack the total resources and requisites for success. Viewing the complete supply chain for producing value, they recognize the necessity of partnering with other organizations.

E-procurement implementation also raises concern over the impact of technological errors and failures that often are overlooked by an organization, (McCue & Roman, 2012). They state that through e-signature, e-notice has a significant effect on reducing lead time, incidences of security, costly errors and authenticating bidders may arise. These however has an impact and will push implementation costs higher since much of the ethical behaviour expected from the vendors may be lost as they would be pressurized to compromise on their integrity.

Use of Information Communication Technology (ICT) in e-Procurement:

Information communication technology (ICT) is synonymous to information technology (IT) which stresses the role of unified communications and the integration of telecommunications, computers and necessary enterprise software, middle wire, storage and audio-visual systems which enable users to access, store, transmit and manipulate information. ICT covers any product that will store, retrieve, manipulate, transmit or receive information through electronic means in any digital form. Christopher and Gattoma (2005) argue that use of information communication technology (ICT) is more efficient than manual system. The cost of employing customer service delivery through ICT and e-procurement can greatly reduce when they are performed online. According to Ongori and Migiro, (2010) ICTs enhances efficiency, reduces cost and broaden market reach both locally and globally for SMEs. Public sector procurement can gain competitive advantage by operational effectiveness when done in the same way as private sector through strategic positioning and the adoption of technology in line with Vision 2030. The Kenya ICT Board has been chosen to lead

Ministry of Lands and Physical Planning digitization process, testing the board's ability to undertake the government's digitization and incorporate local technical providers. The Ministry of Lands hopes to develop an integrated land management plan that allows the public to search and track processes regarding contract and other services online. Technology will be key where members of public will be interested in knowing the time frame for acquiring a title deed after paying the initial fees and tracking the process online instead of visiting the ministry offices physically to follow up.

Organizational Factors:

Procurement managers need a new skill set to steer an organization. Charles, and Omwenga(2017) who argue that the skills required by a modern logistician are no longer restricted to the understanding of how to operate a ware house or how to reduce the rate per mile charged on a particular lane. Procurement managers should equip to set up supply chains that not only respond to knowledge and skills required by members of staff to effectively undertake procurement functions. High degree of professionalism and experience is necessary to enhance service delivery through e-procurement as a cost functional element of the ministry. However, scarcity of trade supply chain managers usually hampers public institutions in complying with procurement laws and other regulations as pertain public procurement. Proper record management systems should be able to offer adequate storage capacity and also integrate records for efficient and effective retrieval and access. The system should not be complex to the extent that it is prone to errors and misfiling that could mess up records. Charles, and Omwenga(2017) examines the declining international competitiveness and the need for more efficient and effective managers. Ideas, concepts and techniques associated with competency in every country, the transfer of these ideas and practices into the public sector helps to spread new public management.

According to Odhiambo and Kamau (2003) evaluation of procurement performance has been problem for procurement professionals in Kenya. Organizational context is key in enabling efficient performance of procurement procedures and it is the role of top leadership to dedicate themselves and take a lead role in ensuring e-procurement is implemented within the organization professionally. According to Theodosiou and Katsikea, (2012) an organization needs to understand the potential benefits of any new technology before it can be adopted.

Lack of competent staff is critical to an organization's realization of effective and efficient supply chain performance as it may affect procurement process management. In improving organizational productivity employee training is important, however, organizations may find themselves filling key procurement positions with seasoned and experienced employees who have the understanding of current process of supply chain (Barsemoi, Mwangagi & Asienyo, (2014).

According to Van Weele, (2010) organizational structure has to include purchasing as a staff function which may fall under production manager and that a procurement function that is carried out professionally is crucial for any service on the value for money principle. Key contributors to staff competence include; training of new employees deployed in procurement department, promoting teamwork among staff, acquaintance with relevant procurement laws and making sure that procurement team has qualified personnel to handle procurement functions in the organization.

Forms of e-procurement supporting supply chain performance:

Public Procurement and Disposal Act (PPDA) 2015 which came into effect as from 15th January 2016 spells out the process and procedure of public procurement. This is a guide to all procurement functions in government ministries and other state or constitutional offices. The act allows the following methods of procurement for goods and services in the ministries; open tender, two stage tendering, design competition, restricted tendering, direct procurement, request for quotations, electronic reverse auction, low value procurement, force account, competitive negotiations, request for proposal, framework agreements and finally any other method and procedure as prescribed in regulations and described in the tender documents. Online transactions include e-tendering, e-sourcing, e-ordering, e-payments, e-evaluation, e-request of quotations, and consultancy among others.

E-tendering attracts bidders from different corners and worldwide to submit their bids for tender or even express interest of prequalification. E-procurement and e-tendering can offer viable alternatives to traditional papers-based processes in any organization (Eadie et al., 2007). However, McCue and Roman, (2012) raises impact of technological errors and failures that could prove costly through security and authenticating bidders electronically. E-tendering allows suppliers to download tender documents and to also submit their bids efficiently online.

E-sourcing includes forward and reverse electronic auctions and online bidding and tendering. Suppliers use e-sourcing to offer their best prices through either a strategic sourcing process or a reverse auction (Johnson& Klassen, 2005).

According to Engelbrecht-Wiggans andKatok, (2006) one of the goals of procurement is to establish a competitive price while affording the buyer some flexibility in selecting the suppliers he should engage and deal with. In e-sourcing the buyer is the auctioneer and the suppliers are the bidders in the purchasing process. The objective of e-sourcing is to cost effectively identify vendors and suppliers of goods, services and works to an organization.

E-procurement is not only an e-ordering and a catalogue buying system but is also a means of exchanging information among firms that participate in e-marketplace (Chang& Wong, 2010). For better supply chain performance in government ministries and departments proper identification of needs and proper selection of items to be ordered electronically to reduce costs. Arbin, (2008) states that achieving the benefits of e-ordering remains a challenge as companies are experiencing difficulties with adoption during implementation. E-ordering can benefit an organization if and when the end users adopt the tool and apply it successfully in their daily work using the system correctly and in full (Reunis, Santema& Harink, 2006).

Supply Chain Performance:

Supply chain performance is the outcome of both effective and efficient purchasing where internal and customer integration is key in improving performance. However effective supply chain performance and management may encounter resistance both from the organization itself and the people within that organization(Fawcett, Magnan & McCarter, 2008).Performance provides how well public entities progress towards predetermined objectives and also guides on future initiatives aimed at starting performance improvements within organizational supply chain. However, despite increased focus on global sourcing little is known about the challenges and solutions on sourcing practices (Gelderman & Semeijn, 2006).

Modern day procurement managers manage procurement and sourcing function both at strategic and operational levels. Their job functions are increasingly becoming cross functional together with supply chain and manufacturing functions (Monczka, et al., (2015). According to KPMG, (2012), the functions are: to ensure the consistent and optimized management of the purchasing processes; to analyze and provide the necessary business information for decision making; to implement e-procurement procedures and systems integration with suppliers; to manage the vendor selection and evaluation systems; and to promote innovation in the supply chain performance (Wollersheim, Hoberg & Krcmar, 2013).

Measuring the performance of supply chain yield benefits to an organization which include; cost reduction, enhanced profitability, quality of supply is improved and also positions an organization to be competitive. Supply chain performance in order to be regarded efficient and effective has to integrate its operations with e-procurement functionalities such as e-tendering, e-sourcing and e-ordering among others.Supplier performance has an impact on supply chain performance, therefore upgrading existing suppliers' performance and capabilities is one of the initiatives of supplier development aimed at meeting the changing competitive requirements, (Humphreys & Chan, 2004).

Public Procurement and Asset Disposal Act (PPADA) 2015 which came into effect as from 15th January 2016 spells out the process and procedures of public procurement. This is a guide to all procurement functions in government ministries and other state and constitutional offices. Despite the government efforts to streamline procurement system, it is marred by shoddy works, corruption, poor quality of goods and services and also delayed delivery and performance of works and contracts. This is caused by weaker enforcement and compliance to regulations which contractors and other suppliers ride on to defeat government intervention whenever procurement disputes arise. Public procurement performance is hampered by bureaucracy in management where government officials always slow the pace at which procurement functions and activities are initiated and completed in government ministries. According to Ladipo, Sánchez and Sopher (2009), procurement arrangement must be supportive of government policy and strategic goals. They further state that a good procurement has to be the one which promotes efficiency and transparency.

By adopting e-procurement organizations must ensure they install necessary technological infrastructure and have integrated their systems to be in line with their needs.Information technology (IT) provides a collaborative platform as it allows customers and suppliers to work together on product and services required through specialised technological design tools. Bughin, Chui, and Manyika (2013) have highlighted one likely consequence for fast-growing cities as the rapid development of dense, digitally enabled commerce; payment systems, digital and technology infrastructure as well as logistics.

Critique Review of Empirical Literature:

The use of computer based information systems normally improves the performance of the organization supply chain. Public authorities are expected to provide excellent service to their constituents in an effective and transparent manner, while working under constant resource constraints by adopting ICT(Amemba, Nyaboke, Osoro, & Mburu, 2013). In order to meet today's operating challenges, regional and local governments are turning to ICT to enhance their service delivery and improve internal efficiencies by lowering costs and increasing productivity. Public authorities are implementing scalable communication infrastructures to promote economic development, attract new businesses and residents, and above all, provide excellent service to constituents (Badaso, 2014).

In Kenya, manual systems are a source of major inefficiencies in regulation and operations of the function (Wanyonyi & Muturi, 2015). ICT needs to be adopted to ensure proper functioning of the procurement system. This does not only involve computerization of the system but scaling up communication technology. E-procurement system is a product of the new world order where everybody is going digital. With globalization and internet connectivity, there is need to upscale the function in government organizations and private entities.

The use of e- procurement to facilitate organizational activities also has a lot of drawbacks that is cost, employee knowhow, attitude and flexibility. According to Monczka, Trent, & Handfield (1998) EDI was, and still is, an expensive option, given that, until recently, organizations sent all EDI transactions over a VAN (Value Added Network) that had set-up and running costs often on a per thousand characters transmitted basis. They also noted that EDI is a cumbersome, static and inflexible method of transmitting data, most suited to straightforward business transactions, such as the placement of purchase orders for known requirements. It is not suitable for transactions requiring tight compiling and coordination, such as the consideration of several possible purchase alternatives or supply chain organization. Unlike human beings, computers are poor at interpreting unstructured data and cannot derive useful information from web documents that are not predefined and permanent.

Collaborating and forming partnership through the internet helps the organization interact with database which provides up to date information and may be space saving substitutes for large reference collections. Access to such databases may be free and unrestricted. Computer profiling and mistakes in the computer matching of personal data and records pauses threat to privacy and software may match personal data incorrectly or improperly on the wrong individuals leading to threshold program (TP) problem.

Another threat is the unauthorized matching of computerized information you extracted from the databases of land ownership, transfer transaction processing systems and selling the information to brokers or other companies for use. Here an individual may lose his or her parcel of land through such malpractices.

According to O'Brien & Marakas(2011), information technology has eliminated monotonous or obnoxious tasks in the office and the factory that formerly had to be performed by people. This includes word processing and desktop publishing which make producing office documents a lot easier to do, while robots have taken over repetitive welding and spray painting jobs in the automotive industry. In many instances, this allows people to concentrate on more challenging and interesting assignments, upgrades the skills level of the work to be performed and creates challenging jobs requiring highly developed skills in the computer industry and within computer- using organization. Thus, information technology can be used to upgrade the quality of working conditions and the content of work activities.

The era of computers and automated information and communication technology has brought both blessings and disappointments at workplaces. Some people have secured well-paying jobs while others have lost or been declared redundant in the jobs due to technology. For example, ordinary clerks in the lands offices who used to do manual collection and searched for land files are being replaced by computers which require few computer literate personnel. The government is further scaling down its workforce by centralizing certain operations through the use of Huduma Centre where public officers are engaged in performing various tasks and offering services for all ministries and departments enabled by use of Information communication technology at one point.

ICT networks are cost effective in the organization although the initial cost of purchase and commissioning of network components may be expensive, the savings experienced and the value added (VA) to service delivery make them a ready choice for government departments and enterprising managers to embrace. One benefit about network is that it greatly increases the efficient use of scare resources (Teicholz, (2012). It is also evident that computer networks have enhanced

daily communication by providing a paperless communication environment. Analogous to e-commerce, which allows businesses to transact with each other more efficiently (B2B) and brings customers closer to businesses (B2C), e-government aims to make the interaction between government and citizens (G2C), government and business enterprises (G2B), and interagency relationships (G2G) friendlier (Fang, 2002).

Critique of Literature Review:

Many global IT applications, particularly finance, accounting, procurement and office applications, have been in operation for many years. Most multinational companies have global financial budgeting and cash management systems and office automation applications such as fax and email system. However, as the GOK keeps on improving the way of service delivery, it has enabled the launch of e-government and e-procurement where accounting officers (AO) who are charged with the control of authority to incur expenditure (AIE) must comply to the new regulations since it is aimed at increasing efficiency and curb wasteful expenditures besides controlling corruption in government ministries and state entities. This is in line with modern development in ICT where everything can be sourced cheaply via the web through e-commerce/procurement, Manzoor, (2010). Examples include global e-commerce websites and customer service systems for customers and global supply chain management systems for suppliers.

The information technology (IT) era has made it easy to some extent the MOL to update its records management systems and reduce time for issuing tenders for works and services as they are now being floated through various forms of e-procurement which include; electronic tendering (e-rendering), electronic ordering (e-ordering), electronic informing (e-informing) and electronic sourcing (e-sourcing). The use of ICT systems has also reduced the handling of cash in the hands of the lands procurement officers where all services are being paid through bank account and deposit slip/receipt presented for processing the required service for issue of miscellaneous receipt (MR) which is the official cash receipt in government departments. Phillips, Chen, Powell, Chen, and Punn, (2009) advocate's that to reduce costs within organizations, IT should be adopted and staff trained on the use of the systems. Other form of payment is through M-pesa payments where the payment reference number is quoted on the transaction documents as proof of payment. However, where M-pesa has been used the system has to be synchronized and reconciled for authenticity purposes. This critically has reduced personnel and risks of handling cash at the government office and seen as away of curbing theft by servant at GoK offices. For better performance of the supply chain management in government ministries and more so ministry of lands proper need identification followed with best selection of a suitable software to be used, Phillips et al., (2009).

Public procurement system has ever years experienced serious operational challenges which include numerous allegations of being riddled with malpractices and corruption. Some of the outcomes of there form process were the establishment of the Public Procurement Oversight Authority(PPOA) created under the Public Procurement and Asset Disposal Act(PPADA) of 2015, (Engelbert, Reit & Westen,2012). PPDA 2015 became operational on 7th January 2016 after repealing PPDA 2005. The main function of the PPOA is to improve transparency in public procurement, ensure fairness, enhance integrity and improve efficiency in the public procurement process.

Public institutions spend huge chucks of their budgets (upto70 percent) in purchasing goods and services (Makabira & Waiganjo, 2014).With the huge amounts at stake, there is need for procurement performance so as to ensure that taxpayers get the value for their money. In attempts to reach this objective, procurement undertakes diverse measures ranging from supplier selection, supplier evaluation, setting of selection and evaluation criteria, staff training, among other measures with the intention of improving supply chain performance. This study therefore, seeks to determine the Role of e-procurement procedures in supply chain performance within the public sector in Kenya with reference to Ministry of land Kisumu County.

Research Gap:

The literature review explained various efforts that have been undertaken to address the role and implementation of e-procurement procedures in supply chain performance within private and state corporations and Parastatal but not in government ministries. Most institutions have e-procurement in form of Enterprise Resource Planning (ERP) that manage key internal processes like human resources and finance (Romero &Vernadat, 2016). E-procurement signals a dramatic shift towards an arm's length relationship solely based on cost reduction Yücesan, & Van Wassenhove, (2004). They however caution that technological enablers alone are not sufficient in effective supply chain strategies. The new economics of information is eliminating the trade-off between richness and reach thereby blowing apart traditional business strategy (Wurster & Evans, 2000). Various researchers have adequately described the need for implementation of

e-procurement on performance of procurement functions in government procurement with most of the research focusing on enterprise resource planning (ERP) to improve inventory control and finding that e-procurement only acts as a helper to the effective functions of management methods, (Rotich & Okello, 2015). Rotich and Okello further state that e-procurement is one of the emerging trends and public procurement functions have been characterized by issues of transparency and accountability. There has been no attempt by scholars to assess the Role of e-procurement procedures in Supply Chain Performance. The study therefore, is aimed at bridging the gap by assessing the Role e-procurement procedures in supply chain performance within state ministries in Kenya with reference to MOL Kisumu.

3. RESEARCH METHODOLOGY

Research Design:

The study adopted a descriptive and analytical research design, which involved qualitative and quantitative research describing observations and examine the findings to come up with conclusive recommendations for implementation, adoption and improvement

Population:

The study was undertaken at the Ministry of Lands county office in Kisumu situated at Ardhi house in Kisumu East Sub County. It is along Bonyo Road opposite Kisumu County Assembly and Imperial hotel. Kisumu Land office serves 7 sub-counties: Kisumu East, Kisumu West, Kisumu Central, Seme, Nyando, Muhoroni and Nyakach. The county is listed by independent electoral and boundaries commission (IEBC) data as number 042 and has the following seven constituencies which also serve as its Sub-Counties. These are Kisumu East, Kisumu West, Kisumu Central, Seme, Nyando, Muhoroni and Nyakach.

Target Population:

The target population was 300, which covered purchasing/procurement department within the survey, mapping, and physical planning, other departments supporting Procurement and counter services within MOL. The target population during the study included top management, procurement department and user departments that directly relates with procurement department in sourcing process.

3.1 Sample Frame:

Cooper and Schindler (2003) describe a sample frame as a list of all population units from which the sample is selected. The respondents sampled during the survey were from procurement and other members of staff at MOL Kisumu and service seekers at the Lands office banking halls and around the premises who either use or benefit from e-procurement procedures at the Lands office operations. This study target was a sample size of 172 members of staff and service seekers who visited the office during the five working days of a week as described in the sampling procedure.

3.2 Sample and Sampling Techniques

A sample is a section of the total population of the study where the sample statistics are a representation of the total population under study. The sample represents a subset of manageable size where the samples are collected and statistics then calculated from the samples so that one can make inferences or extrapolations from the sample to the population. This study utilized a sample size of 174. The use of 174 respondents was justified as it is in line with Ogachi (2011) who indicated that the use of a generous sample is appropriate because it is quick, inexpensive, efficient and accurate means of assessing information about the population. Since the sample size of 174 represented 58% of the total population it was deemed appropriate. Furthermore, the sample size allowed the researcher to collect data from respondents. The distribution of the sample size is as shown in table 3.1.

Table Error! No text of specified style in document.**.1: Sampling frame**

Category	Target population	Sample size	Percentage (%)
Procurement department	10	5.8	3
Counter Services	25	14.5	8
Other members of staff	100	57	33
Service seekers	165	95.7	56
Total	**300**	**174**	**100**

Source: MOL (2018)

Formula for arriving to Sample Size:

58/100 = Sample size

Procurement Department $\frac{58}{100} * 10 = 5.8$

Counter services $\frac{58}{100} * 25 = 14.5$

Other members of staff $\frac{58}{100} * 100 = 58$

Service Seekers $\frac{58}{100} * 165 = 95.7$

This study targeted a sample size of 174 respondents thereby agreeing with Ogachi (2011) who argues that use of a generous sample is appropriate because it is quick, inexpensive, efficient and accurate means of assessing information about a population.

Data Collection Instruments:

The study used a semi structured questionnaire designed for data collection where both close and open-ended responses were capturedThe self-administered questionnaires have the advantage of being flexible because they contain both open and closed ended questions which help in gathering in-depth information so that the study got detailed and complete understanding of the issue under research (Kombo & Tromp, 2006). Each question in the questionnaire was developed to address a specific objective or research question of the study.

Data Collection Procedure:

In the study, Primary data was used for this study. It was collected using self –administered questionnaires. The tool was semi-structured and the questions sought to determine the extent to which the independent variables affect the supply chain performance at MOL. It consisted of both open and closed ended questions. The questions were designed to elicit responses for both qualitative and quantitative analysis. Drop and pick later method was used to administer questionnaires.

The designed questionnaires were administered to 5 respondents at Kisumu County land offices aimed at testing the data quality and also to checked for coherence and consistency during the interview and data entry. Any inconsistency was addressed through amendment of the questionnaire as appropriate. The amended questionnaire was then subjected to piloting using 10 respondents and the process repeated to check for data quality and coherence. Once the questionnaire was considered complete, data collected at that point formed part of the research data set. Secondary data was gathered from existing credible and recognized sources. The data comprised of desirable materials, current, accurate, sufficient and relevant collected from library text books, internet and magazines and personnel file in the organization.

Data Processing and Analysis:

Data was organized, processed and analyzed using MS Excel and the Statistical Software for Social Sciences (SPSS) respectively. According to (Gall & Borg, 2007), data processing and analysis refers to a process of inspecting, cleaning, transforming and modeling data with the goal of discovering useful information, suggesting conclusions and supporting decision making. The researcher edited the completed questionnaires for completeness and consistency and data was cleaned up. The gotten data was analyzed using descriptive statistics using the descriptive statistical tool (SPSS) to describe the data. Analysis was done through running frequency distributions tables to assess the extent of e-procurement adoption in procurement performance at the lands' office. A Likert scale was used to evaluate the extent of e-procurement in service delivery.

Statistical Model:

The multiple regression model was used to evaluate the relationship between dependent and independent variables. The model will be used as follows:

Where, Y = Supply Chain Performance

β_0 = Constant of Regression

X_1 = E-procurement Adoption

X_2 = use of ICT in e-procurement

X_3 = Organizational Factors

X_4 = Procurement Procedures

ε = error of regression

B0is the constant or intercept while β1, β2, β3, and β4, are the corresponding coefficients for the respective independent variables. ε is the error term which represents residual or disturbance factors or values that are not captured within the regression model. The interpretation of X, β and ε is the same for the subsequent equations for testing the other study objectives. Interpretations are as stated above.

Presentation:

Data presentation is the method by which people summarize, organize and communicate information using a variety of tools, such as diagrams, distribution charts, histograms and graphs. The findings are presented using tables and graphs for further analysis and to facilitate comparison. This will generate quantitative reports through tabulations, percentages, and measure of central tendency.

4. RESEARCH FINDING AND DISCUSSION

Response Rate:

The researcher administered a total of 200 questionnaires and 174 were completed and returned. This represents a rate of 87% as shown in Table 4.1. This response rate was adequate to allow the researcher to continue with the analysis. The questionnaires were composed of questions that addressed the objectives of the study.

Table Error! No text of specified style in document.**.1: Response rate**

Category	**Frequency**	**Percentage**
Completed and returned	174	87
Not returned	26	13
Total	**200**	**100**

Reliability Results:

Cronbach's Alpha was used to test the reliability of the questionnaire. Since the research instrument yielded reliability coefficient of more than 0.7 on E-procurement Adoption, Use of ICT in e-procurement, Organizational Factors, and Procurement Procedures. It can be concluded that the research instrument was adequate for subsequent analysis**.**

Table 4.2: Cronbach Alpha for Reliability Assessment

Variables	Number of Items	Cronbach Alpha	Remarks
E-procurement Adoption	5	0.713	Accepted
Use of ICT in e-procurement	5	0.708	Accepted
Organizational Factors	5	0.810	Accepted
Procurement Procedures	5	0.620	Questionable
Supply Chain Performance	5	0.960	Accepted

Validity Results:

Bartlett's test of sphericity was applied to test whether the correlation between the study variables exists while Kaiser Mayor-Oklin measures of sampling adequacy (KMO) as shown in Table below. The Kaiser-Mayor-Oklin measures of sampling adequacy show the value of test statistic as 0.640 and p-value <0.05. Bartlett's test of sphericity had a chi-square value of 9606.959 p-values of 0.000. Since the p-value is less than 0.05, then it implies that there exists a relationship between the study variables, therefore, providing a ground for further statistical analysis to be conducted.
KMO and Bartlett's Test

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Table 4.3: KMO and Bartlett's Test

KAISER-MEYER-OLKIN MEASURE OF SAMPLING ADEQUACY.	**0.640**	
Bartlett's Test of Sphericity	**Approx. Chi-Square**	**9606.959**
Df	**300**	
Sig.	**.000**	

Descriptive Statistics:

Indicators of e-procurement adoption:

The respondents were asked to indicate their level of agreement with various aspects on the indicators of e-procurement adoption. From the findings, the respondents agreed that those whose duties directly involve use of computers were 94.8% and only 5.2% respondents had their duties not related to use of computers. However, on the element of respondents having their duties and activities directly involved in procurement and also involving use of computers, the response was that 44.8% agreed while 55.2% indicated that their duties did not involve procurement and use of computers/technology.

The aspects of e-procurement adoption the respondents agreed with 35.6% that computers had been implemented within the lands office while 40.8% disagreed. The respondents also disagreed that procurement department had been technologically equipped for smooth operations with 44.2 % while 40.8% agreed with the fact. On the extent to which e-procurement has improved stock movement and its control there was a tie of 40.8% for those respondents supporting the aspect and those who disagreed were also 40.8%. As par the extent on which e-procurement has increased efficiency, effectiveness and dependability, 42.9% agreed with the aspect while 42% disagreed on the fact that e-procurement had increased efficiency, effectiveness and dependability at the ministry of lands office in Kisumu County. The results agreed with Steinberg (2003) assertion that implementation of e-procurement system does not appear smooth to an extent government e-procurement projects usually are unsuccessful. The rest of the results have been summarized in the table below.

1-Strongly Agree 2-Agree 3-Neutral 4-Disagree 5-Strongly Disagree

Table 4.4: Aspects of e-procurement adoption

Aspects of e-procurement adoption	**Percentage (%)**				
	5	**4**	**3**	**2**	**1**
Ministry of Lands has implemented use of computers in operations	17.8	23.0	23.6	14.9	20.7
Procurement department is technologically equipped for its smooth operations	17.8	26.4	14.9	20.7	20.1
E-procurement has improved stock movement and control	17.8	23.0	18.4	22.4	18.4
E-procurement has increased efficiency, effectiveness and dependability	20.7	21.3	15.1	23.8	19 .1

The respondents were asked to indicate level of agreement with various aspects regarding challenges hampering the adoption of e-procurement. From the findings, the respondents agreed with a percentage of 99.4% that security of the system was the major challenge. This was followed by 62.6% respondents who said cost of installing relevant technological infrastructure was an impediment to the adoption of e-procurement. Others noted that level of expertise required to operate e-procurement, lack of management support as well as insubordination in system use challenges hampered e-procurement adoption with the following percentages; 54%, 24.1% and 3.4% consecutively**.**

Table 4.5: Challenges hampering e-procurement adoption

Challenges hampering e-procurement adoption	**Frequency**	**Percentage (%)**
Security of the system	173	99.4
Cost of installation	109	62.6
Level of expertise required for its operation	94	54.0
Lack of management support	42	24.1
Insubordination in system use	6	3.4

Use of ICT in Procurement:

The respondents were asked to indicate their level of agreement with various aspects of the use of ICT in e-procurement. From the findings, the respondents agreed with a percentage of 73% that e-procurement and related ICT cost has affected

supply chain performance. Also the respondents agreed with a percentage of 70.7% that online communication technologies are key to effective e-procurement within an organization. Furthermore, system integration challenges within Kisumu Lands office has affected e-procurement with a 66.1% of the respondents with only 13.2% disagreeing with this factor. ICT adoption in e-procurement has effectively improved supply chain performance in the lands office as shown by a percentage of 63.8%. The findings collaborate with the research by Rosemann and vomBrocke, (2015) who have indicated that at enterprise level, business information technology (BIT) alignment is a pervasive problem and one of the factors promoting company performance in the use of IT in business communication. The impact of technology is shaping the way supply chain performance is undertaken in organizations as they adopt e-procurement. Effective implementation of e-procurement will be driven by the emerging information about use of information communication technologies. These will influence not only technological aspect of supply chain performance but also present functional structures within which procurement activities operate. The rest of the results have been summarized in the table below.

1-Strongly Agree 2-Agree 3-Neutral 4-Disagree 5-Strongly Disagree

Table 4.6: Use of ICT in e-procurement

Aspect of use of ICT in Procurement	Percentage (%)				
	5	4	3	2	1
E-procurement and related ICT cost has affected supply chain performance	0.0	0.0	27.0	33.9	39.1
Online communication technologies are key to effective e-procurement	0.0	9.8	19.5	35.6	35.1
System integration challenges has affected e-procurement performance	2.9	10.3	20.7	25.3	40.8
ICT adoption in e-procurement has effectively improved supply chain	4.6	9.8	21.8	21.8	42.0

Organizational Factors:

The respondents were asked to indicate their level of agreement with various aspects of the organizational factors. From the findings, the respondents agreed with a percentage of 63.2% that organizational context promote supply chain performance with only 16.6% disagreeing. The respondents also agreed that professional qualifications influence organizational management where a percentage of 62.6% agreed while 16.6% disagreed with the aspect. The respondents further agreed that knowledge and skills within an organization is key to improved performance and that top management has been supportive in implementing supply chain performance, these had a percentage of 62.1% and 57.4% respectively with those respondents disagreeing being 18.4% and 12.6% respectively. These outcome correlates with Li, Pillutla, Zhou and Yao, (2015) who have stated that lack of knowledge and skills constitutes a major barrier for organization to adopt e-procurement and therefore perceived ease of use of e-procurement system influences top management support for such a system. The rest of the results have been summarized in the table below.

1-Strongly Agree 2-Agree 3-Neutral 4-Disagree 5-Strongly Disagree

Table Error! No text of specified style in document.**.7: Organizational Factors**

Aspects of Organizational factors	Percentage (%)				
	5	4	3	2	1
Top management supportive in implementing supply chain performance	2.3	10.3	29.9	28.7	28.7
Knowledge and skills within an organization key to improved performance	4.6	13.8	19.5	43.7	18.4
Professional qualifications influence organizational management	4.0	12.6	20.7	40.2	22.4
Organizational context promoted supply chain performance	5.7	10.9	20.1	40.2	23.0

Forms of e-procurement:

The respondents were asked to indicate the extent to which they agree with various aspects of the forms of e-procurement. From the findings, the respondents agreed with 57.5% that online transactions had been made easy through e-tendering with only 25.8% disagreeing. Also, the respondents agreed with a percentage of 55.4% that procurement procedures had led to good forecasting and purchase of goods and services with 49.4% agreeing that regulations have greatly affect e-procurement performance positively. Furthermore, the respondents agreed with 43.4% that enforcement and compliance of e-procurement requirements is helpful to any procurement department within an organization. The rest of the results have been summarized in the tale below.

1-Strongly Agree 2-Agree 3-Neutral 4-Disagree 5-Strongly Disagree

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Table 4.8: Forms of e-procurement

Aspects of forms of e-procurement	Percentage (%)				
	5	4	3	2	1
Online transactions have been made easy through e- tendering	10.9	14.9	16.7	21.3	36.2
Regulations greatly affected e-procurement performance	8.6	17.2	24.7	24.1	25.3
Enforcement and compliance of e-procurement requirements helps procurement department	11.5	14.9	28.2	19.0	24.4
Procurement procedures lead to good forecasting and purchase of goods and services	13.8	12.6	18.4	27.0	28.4

Supply chain performance:

Weight of the factors and their contribution to supply chain performance within government ministries

The study wished to establish how the respondents ranked the factors on their contribution towards e-procurement procedures on supply chain performance within government ministries. According to the ranking, e-procurement adoption had the greatest effect on the supply chain performance followed by the use of ICT in e-procurement, organizational factors while forms of e-procurement had the least effect to the supply chain performance in government ministries. The results have been summarized in the table below.

Table 4.9: Weight of the factors and their contribution to supply chain performance within Government Ministries

Factors	Frequency	Percentage
E-procurement adoption	67	39%
Use of ICT in e-procurement	54	31%
Organizational factors	30	17%
Forms of e-procurement	23	13%
Total	174	100%

Aspects of supply chain performance:

The respondents were asked to indicate their level of agreement with various aspects of the supply chain performance. From the findings, the respondents agreed with 48.2% that effective supply chain performance ensures that goods and services are procured within the set budget and timelines. Also, the respondents agreed that efficient supply chain performance leads to timely completion of projects and delivery or goods and services with a percentage of 44.2%. Furthermore, a stakeholder is considered certified when supply chain performance is successful and timely undertaken as shown by 43.1%. Finally, a supply chain to be dependable it must be tailored within the laid down regulations as shown by a percentage of 41.4%. The rest of the results have been summarized in the table below.

1-Strongly Agree 2-Agree 3-Neutral 4-Disagree 5-Strongly Disagree

Table 4.10: Aspects of supply chain performance

Aspects of supply chain performance	Percentage (%)				
	5	4	3	2	1
Efficient supply chain performance leads to timely completion of projects and delivery of goods and services.	14.9	20.7	20.1	17.2	27.0
Effective supply chain performance ensures goods and services procured are within set budgets and timelines.	21.3	13.2	17.2	17.2	31.0
For a supply chain to be dependable it must be tailored within the laid down regulations.	21.3	13.6	23.6	19.0	22.4
A certified stakeholder is considered when supply chain performance is successful and timely undertaken.	18.4	13.8	24.7	11.5	31.6

Relationship between Supply Chain performance and E-procurement procedures:

A correlation analysis revealed that there was no significant correlation between ICT in E-procurement and indicators of E-procurement adoption, $r(n=174)=-0.162$, $p=0.419$. The Spearman's correlation analysis revealed a significant association between ICT in E-procurement and Organization factors, $r(n=174)=0.80$, $p<0.001$.However, correlation analysis revealed that there is a strong significance between organizational factors and forms of e-procurement $r(n=174)=0.523$, $p<0.001$. Similarly, forms of e-procurement and supply chain performance showed a significant association $r(n=174)=0.681$, $p<0.001$

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Table Error! No text of specified style in document.**.11: Spearman's Correlation analysis showing relationship between Supply Chain performance and E-procurement procedures**

			1	2	3	4	5
Correlation Coefficient	1.	Indicators of E-procurement adoption	1.000				
	2.	ICT in E-procurement	-.062	1.000			
	3.	Organizational factors in Procurement	.022	.800**	1.000		
	4.	Forms of E-procurement	.024	.429**	.523**	1.000	
	5.	Supply chain performance	.049	.352**	.377**	.681**	1.000
Sig. (2-tailed)	1.	Indicators of E-procurement adoption					
	2.	ICT in E-procurement	.419				
	3.	Organizational factors in Procurement	.770	.000			
	4.	Forms of E-procurement	.752	.000	.000		
	5.	Supply chain performance	.518	.000	.000	.000	

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

Source: Researcher 2018

Regression Results:

A multiple linear regression analysis was performed to test the effect of the independent variables on the dependent variable. The average ratings for the four independent variables (E-procurement adoption, use of ICT in e-procurement, organizational factors and forms of e-procurement) were used as the indicators for input into the regression model. Three measures of supply chain performance (efficiency, effectiveness and dependability) were used. The coefficient of determination and standard error of the regression model is indicated in Table above.

Further, the regression output in Table below presents the source of variance, mean of variances and the f value. The results indicate that the overall model was significant (f value= 41.77; $p<0.05$) and could provide important results. This indicates that the model could provide some predictive significance and was a good fit.

Analysis of Variance revealed that there Supply Chain Performance depended significantly to at least one of the e-procurement procedures. The Table below on Regression of coefficients further reveal which procedures significantly influence Supply Chain performance**.**

Table Error! No text of specified style in document.**.12: Summary of One-Way ANOVA results**

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	108.625	4	27.156	41.773	.000
Residual	109.866	169	.650		
Total	**218.491**	**173**			

Further table of regression coefficients revealed that E-procurement adoption significantly influenced Supply Chain performance in Kisumu County lands offices, ($\beta=0.543$ $t=4.027$, $p<0.05$). In addition to this, ICT in E-procurement also showed that it had a significant influence on Supply Chain performance in the lands offices, ($\beta=0.375$, $t=1.711$, $p<0.05$). Furthermore, the regression analysis also revealed that organizational factors in procurement significantly influence supply chain performance in the lands offices, ($\beta=0.205$, $t=1.067$,$p=0.007$). Lastly, forms of e-procurement displayed a significant influence to supply chain performance in the county lands office, ($\beta=0.776$; $t=10.039$; $p<0.05$). This is summarized in Table below.

Table 4.13: Significance of Independent Variables

Variables	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	2.813	.532		4.551	.000
E-procurement adoption	.543	.248	.676	4.027	.000
ICT in E-Procurement	.375	.232	.437	1.711	.000
Organizational factors	.205	.174	.379	1.067	.007
Forms of E-procurement	.776	.077	.693	10.039	.000

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As per Table above, the equation;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Becomes:

$$Y = 2.813 + .543X_1 + .375X_2 + .205X_3 + .776X_4$$

Where; Y is the dependent variable: -supply chain performance.

$\mathbf{X_1}$ – E-procurement Adoption

$\mathbf{X_2}$ – use of ICT in e-procurement

$\mathbf{X_3}$ – Organizational Factors

$\mathbf{X_4}$ – Forms of e-procurement

a. **Predictors: (Constant**), E-procurement adoption, ICT in procurement, organizational factors and forms of e-procurement.

b. **Dependent variable:** Supply chain performance.

5. SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary of the findings:

The purpose of the study was to assess the role of e-procurement procedures on supply chain performance within government ministries in Kenya. The study sort to answer the following questions: what are the indicators of effective e-procurement adoption and how it has improved supply chain performance within government ministries? What are the challenges facing use of ICT systems in e-procurement within ministry of lands? How do organizational factors impact on supply chain performance at the ministry of lands Kisumu county office? What are the forms of e-procurement supporting supply chain performance?

E-procurement Adoption:

The study has established that e-procurement adoption discussed in the study include the direct involvement of procurement duties and use of computers, implementation of computers in operations, the technologically equipping of procurement department, extent to which e-procurement has improved stock movement, how e-procurement has increased operations and challenges hampering adoption of e-procurement process among others have a significant effect on the supply chain performance. The regression model has established that adoption of e-procurement has a positive relationship with supply chain performance. The study therefore shows that taking all other factors constant a 1% increase in e-procurement adoption would lead to 54.3% increase in the supply chain performance.

Use of ICT in e-procurement:

In relation to use of ICT in e-procurement the model shows there is a positive relationship between use of ICT in e-procurement and supply chain performance. The aspects which the study put into consideration included; e-procurement and related ICT cost, online communication technologies, challenges of system integration and ICT adoption in e-procurement among others. The regression model shows that taking all other variables constant a 1% increase in the use of ICT in procurement would lead to 37.5% improvement of supply chain performance.

Organization factors:

The regression model shows appositive relationship between organization factors in procurement and supply chain performance. The study put into consideration the following aspects; top management supports implementation of supply chain performance, knowledge and skills within an organization is key to improved performance, professional qualifications influence organizational management and organizational context promote supply chain performance among others. The model therefore concluded that taking all other variables constant a 1% improvement in all aspects of organizational factors will only lead to a 20.51% increase in improvement of supply chain performance in question. This could be attributed to the fact that though lack of knowledge and skills could be the known major barrier for organizations

to adopt e-procurement, commitment and top management support has to take the lead role in order for the organization to fully adopt e-procurement. In the study most respondents maintained a high neural stand as pertain aspects of top management and their support in implementing supply chain performance, professional qualifications influence organizational management and organizational context promote supply chain performance where they had a percentage of 29.9%, 20.7% and 20.1% respectively.

Forms of e-Procurement:

In relation to forms of e-procurement the model shows that there is a strong positive relationship between forms of e-procurement and supply chain performance. The aspects which were put into consideration in the study include; online transactions have been made easy through e-tendering, regulations have greatly affected e-procurement performance. Other aspects included enforcement and compliance with e-procurement requirements helps procurement department and finally procurement procedures lead to good forecasting and timely purchase of goods and services among others. The study established that there was a strong positive relationship existing between the forms of e-procurement applied in the organization and supply chain performance. The model therefore concluded that taking all other variables constant a 1% increase in forms of e-procurement will lead into 77.6% increase in improvement of supply chain performance of an organization. Therefore, it means that for any organization to effectively manage its supply chain it must largely adopt e-tendering, e-sourcing and e-ordering and others as a means of controlling and monitoring the procurement functions.

Conclusion:

Based on the study findings, the study concluded that e-procurement adoption, use of ICT in e-procurement, organizational factors and forms of e-procurement played a role in supply chain performance at ministry of lands Kisumu County. The regression model of the study showed that e-procurement adoption factors in infrastructural development through computer operations, technologically equipping procurement department, improvement in stock control by use of e-procurement and increased efficiency, effectiveness and dependability by organizations are playing a role on supply chain performance to a significant extent as indicated by the high level of agreement from the respondents.

The study further concludes that organizations in Kenya consider e-procurement and the related ICT cost of implementation. This could be undertaken through evaluating suitable online communication technologies, integrating systems in line with the procurement operations and also adopting ICT software which has been tailored to their supply chain for improved performance. In order to effectively implement e-procurement emerging information about ICT technologies needs to be implemented to enable the organization to remain afloat in its procurement operations.

The study established that successful implementation of e-procurement largely depends on compliance and enforcement of regulations, top management support, knowledge and skills added to professional qualifications of its staff help to promote supply chain performance in an organization.

Recommendations:

The study, basing on the findings and conclusions presented above makes recommendations that management of supply chain performance in public organizations needs to effectively adopt e-procurement procedures that would facilitate their supply chain activities. E-procurement ought to be adapted to aid senior management in government ministries to recognize the contribution of such technology in service delivery. A flexible e-procurement operational system adopted through proper research will effectively and efficiently help any organization and business entities fulfill their ever changing needs and also deal with challenges that may arise from a dynamic global business setting. Decision makers and other senior management should support and implement suitable e-procurement systems backed by communication infrastructure that is tailored to their operations. Partnering with service providers, adopting the right ICT tools and training staff on the use of the systems are essential. Proper need identification should be undertaken so that the appropriate software and the right external partners are cost effectively sourced for smooth and efficient e-procurement procedures implementation within government ministries. All these should be undertaken with reference to set out regulations and relevant laws guiding public procurement and by extension e-procurement.

Recommendations per variable:

The study highly recommend that organizations and state ministries should pay more attention to all below recommendations in order to remain relevant and competitive in the labour market and service delivery.

E-procurement Adoption:

Improved procurement performance in Kenya cannot be realized without incorporating e-procurement within any given organization's supply chain. It is recommended that adherence to the set out procurement regulations by Public Procurement and Asset Disposal Act 2015 which spells guidelines on how public organizations can implement e-procurement is necessary. Consequently, in order to realize a paperless procurement operation, organizations have to be engaged in building supplier networks, support from top management and training, investing in infrastructural development as well as promoting innovation in the procurement functions needs to be implemented. A completely fully running e-procurement in an organization may yield savings in inventory control and other activities like receipts, ordering, packaging and shipping costs from suppliers. However, proper e-procurement adoption may face challenges of errors and failures but enabling efficiency and effective use of e-signature, e-notices and e-catalogues among others may help to reduce lead time and costly errors.

Use of ICT in e-procurement:

The study recommends that procurement managers need to be aware of their supply chain technology preferences and take into account the cost of implementing the same by the organization. They should also make sure the organization is ready to meet cost of setting up and other standing charges and costs that will have to be settled by the organization. Efficiency is achieved through undertaking e-catalogues, e-tendering, e-information and telecommunication where both the purchasing and selling organization may utilize the platforms in supply chain performance. When information technology is integrated into organization's supply chain it enhances efficiency and reduces cost as compared to manual systems. Public sector procurement can gain competitive advantage in operational effectiveness when applied electronically and in similar way as private sector organizations.

Organizational Factors:

The study recommends that top management should endeavor to take a lead role in supporting the implementation of e-procurement within the organization supply chain. Competent and experienced workforce mainly procurement managers should be hired to ensure that the right procurement leadership team is employed to lead a supply chain process implementation. This must be undertaken with a focus to promoting professionalism, weed out corruption and enabling the organization to fully adhere to procurement regulations for public entities more so the adoption and implementation of e-procurement. Further the procurement managers should ensure all public procurement functions are guided by Public procurement and Asset Disposal Act (PPADA) 2015, Public procurement oversight Authority (PPOA) and the constitution. Funds should also be made available to procurement department to enable them deliver on their procurement plans and in accordance to user department requisitions.

Forms of E-procurement:

The study recommends that procurement managers need to be aware of the supply chain technology preference tailored to their organizational performance. They should also provide and ensure installation of relevant tools and equipment are in place for use by staff and other stakeholders who include suppliers and customers. When such technological infrastructure has been implemented staff and suppliers can be motivated thereby contributing to effectiveness and efficiency in service delivery. Implementation of technological systems can either act as a medium of change or may be the means of achieving a desired change in procurement and in the organization at large.

Enforcing and complying with e-procurement regulations will greatly help procurement departments as they undertake procurement functions. The regulations would give guidelines on how to adopt e-procurement and the relevant platforms an organization should install and operate from notwithstanding security and compatibility challenges that may arise to which the management has to look for ways of mitigating them.

Suggestions for further Research:

The study was conducted at a single county government. It is recommended that further studies be conducted in other county government across the country and consider other factors that might influence role of e-procurement procedures on supply chain performance within government ministries. A study should also be undertaken to evaluate the best practices that may improve e-procurement procedures adoption within government ministries as a means of enhancing supply chain. Further research should be conducted to analyse other factors which could be affecting the adoption of e-procurement procedures and practices in government ministries and other county governments in Kenya.

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