FACTORS AFFECTING THE IMPLEMENTATION OF ELECTRONIC PROCUREMENT AT KENYA PORTS AUTHORITY, MOMBASA

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ABSTRACT

The aim of the study was to examine the factors affecting the implementation of e-procurement at KPA. The Implementation of e-procurement in the public sector has been affected by several factors and it being one of the new technologies, most of these organizations have already taken advantage of the value of e-procurement systems. The overall objective of this study was to examine the factors affecting e-procurement implementation at KPA it being one of the public organizations in Kenya. The study was guided by the following objectives: to establish the effects of the level of technological infrastructure employed on e-procurement implementation at KPA, to establish the extent of management support in the implementation of e-procurement at KPA, to establish the extent to which budgetary allocation affects the implementation of e-procurement at KPA, to establish how staff proficiency in ICT skills affects the implementation of e-procurement at KPA. The research design used in this study was a case study. The target population therefore was; Procurement department staff who are 90 and Finance departments who are 120 and 40 suppliers. The sample size of this study was a total of 201 people; 73 from Procurement being 81% of the total population and 92 from Finance being 77% of the total population, plus 36 prequalified suppliers. Descriptive statistics and factor analysis was used to determine factors affecting implementation of e-procurement at KPA. The researcher found out that the factors discussed hereby greatly affected the implementation of e-procurement at KPA, most members of staff believed that top management support was lacking, the budget allocated was little, most of the members of staff lacked ICT skills and lastly with the level of technology employed, members of staff had mixed reactions depending on one's level of education. The researcher gave recommendations as follows: the organization should fully equip its human resource with skills necessary to discharge their duties and that management should embrace the full implementation of e-procurement in the organization.

Key terms: Accounting officer, Competitive bidding, Direct procurement, e-procurement, ERP, Procurement, Public Procurement, MRO, Standard tender documents

INTRODUCTION

The last decade has seen the importance of public procurement grow not only in Kenya but across Sub-Saharan Africa owing to the fact that the share of public procurement in the GDP of Sub-Saharan African countries ranges between 8-15%. Likewise, improvements in procurement legislation and its implementation have on average resulted in savings of 30% , (Shalle and Irayo 2013).

Public procurement is defined as the purchase of commodities and contracting of construction works and services if such acquisition is effected with resources from state budgets, local authority budgets, state foundation funds, domestic loans or foreign loans guaranteed by the state, foreign aid as well as revenue received from the economic activity of state. Besides, it was realised that the Procurement personnel were not adequately trained and there was also lack of professionalism amongst them, and there was no professional body to oversee and install discipline among procurement officers.

According to International Journal of Science and Research (IJSR), Volume 2 Issue 8, August 2013, Kenya like many of her counterparts in the developing world was marred by high inefficiencies in spending of taxpayers' money, particularly in the area of public procurement. The number of enterprises which had the privilege of doing business with the state was highly limited and there was no true competition among them. The procedure of public procurement was completely non-transparent and unregulated and there was no institutional framework whatsoever. It was in view of all these shortcomings that the Kenya government in conjunction with other stakeholders like the International Trade Centre, World Bank and the Africa Development Bank, thought of looking for a way to eliminate the deficiencies by initiating the procurement reform process. The reform process was meant to create a system that allowed proper delegation of authority, procurement threshold, planning and development of supplies manual. The primary focus was to address the issue of procurement laws, establish appropriate procurement Institutions and entities, and create adequate and timely monitoring and evaluation mechanism.

This marked the birth of the Public Procurement and Disposal Act 2005 and Public Procurement Regulation 2006 which was key in regulating public procurement. Currently, Public procurement in Kenya is governed by the Public Procurement and Asset Disposal Act 2015. This legislation came into effect on 7 January 2016, repealing the previous Public Procurement and Disposal Act of 2005, and all state organs and public entities within Kenya are required to comply with this law in regard to planning and undertaking procurement, inventory management, asset disposal and contract management, except where the provisions of the Public Private Partnership Act, 2013 already apply to procurement and disposal of assets, or where procurement and disposal of assets takes place under bilateral or multilateral agreements between the Government of Kenya and any other foreign government or multilateral agency.

Before the introduction of Public Procurement and Disposal Act 2005, the government of Kenya through the Financial Regulations of 1970, gave the Ministry of finance the overall responsibility of regulating the procurement of goods, works and services, where the Ministry communicated all procurement issues to government department through circulars. Later the government realized that this procurement system had several deficiencies that contributed to huge losses in public funds.

Public procurement must be transacted with other considerations in mind, besides the economy. These considerations include accountability, non-discrimination among potential suppliers and respect for international obligations. It is worth noting that unlike private procurement, public procurement is a business process within a political system and has therefore significant consideration of integrity, accountability, national interest and effectiveness. The procurement system was noted to lack transparency, accountability and fair competition. It is with this view that the government intended to reduce or eradicate these challenges all together by introducing electronic procurement in all public institutions.

(Croom and Brandon, 2014), define e-Procurement as the use of internet based (integrated) information and communication technologies (ICT) to carry out individual or all stages of the procurement process. While there are various forms of e-Procurement that concentrate on one or many stages of the procurement process such as e-Tendering, e-Marketplace, e-Auction/Reverse Auction, and e-Catalogue/Purchasing, e-Procurement can be viewed more broadly as an end-to-end solution that integrates and streamlines many procurement processes throughout the organization (Vaidya and Callender, 2016). Some of the commonly used tools in the public sector are e-Tendering, e-RFQ, e-Auctions, e-Catalogues, and e-Invoicing.

(Baily 2008) classifies e-procurement into the seven categories: the first is Web-based ERP (Enterprise Resource Planning). This deals with creating and approving purchasing requisitions, placing purchase orders and receiving goods and services by using a software system based on Internet technology. The second category is E-MRO (Maintenance, Repair and Operations) which deals with creating and approving purchasing requisitions, placing purchase

orders and receiving non-product related MRO supplies. The third type is E-sourcing. This involves identifying new suppliers for a specific category of purchasing requirements using Internet technology. The fourth type is E-tendering which involves sending requests for information and prices to suppliers and receiving the responses of suppliers using Internet technology. E-reverse auctioning is another type of e-procurement. This uses Internet technology to buy goods and services from a number of known or unknown suppliers. The sixth type is E-informing which involves gathering and distributing purchasing information both from and to internal and external parties using Internet technology. The last type of e-procurement, according to Baily (2008), is E-market sites. Here, buying communities can access preferred suppliers' products and services, add to shopping carts, create requisition, and seek approval, receipt purchase orders and process electronic invoices with integration to suppliers' supply chains and buyers' financial systems.

These tools, including complete marketplace technologies, have been developed by the key players in the e-Procurement market such as Ariba, Commerce One, Oracle, and SAP. Regardless of the various shapes and sizes of e-Procurement systems in the market, it has been argued that the basic procurement process is the same across the public sectors and can be addressed with straightforward technology to automate standard processes, Whang and Johnson, 2009.

The study targeted Kenya Ports Authority's procurement department. The study aims at establishing whether electronic procurement has achieved its intended objectives of making procurement more efficient and effective by seeking to know the factors affecting its implementation. The overall objective of this study

is to examine the factors affecting e-procurement implementation at the Kenya Ports Authority.

The history of The Port of Mombasa dates back many centuries from the existence of the Old Port. The Port served dhows from India, Arabian Gulf and Far East. It is located near Fort Jesus at Mombasa Old Town. In 1890, Kenya and Uganda became a British Protectorate under the Imperial British East Africa (IBEA). The colonial government saw a need to create infrastructure inland to open up the area for effective administration, hence the construction of the Kenya- Uganda Railway (1895-1902). Coupled with increased activities at the Port there was need for a more spacious and convenient place to meet the demand and for construction of a rail network. Therefore the Port of Mombasa was relocated to the Kilindini Harbor West of Mombasa Island. The development of the present Port of Mombasa commenced in 1896 when the first Jetty, used for discharging materials for the construction of the railway line was built at Kilindini.

1970 saw Mbaraki wharf built to handle specialized dry bulk cargo. This includes cement and fluorspar, clinker among other bulk cargoes. The Wharf comprised of two berths of 312 meters long. Containerization concept started in Greece in the mid1950s and spread like bushfire, in the global maritime transport due to convenience and security advantages containers come with. The Port of Mombasa handled its first container in 1975, and the experience of handling the few containers heralded the emergence of containers in the maritime sector in the region prompting the construction of berths nos. 16 and 17 and later in 1980 berth no 18 was completed to facilitate container cargo handling.

In 2011 the Port channel was dredged to minus 15 meters and its turning basin widened to 300 meters. Alongside berths are now 12 meters deep.

In the same year, a new berth no. 19 was built and completed in 2013. The berth is 240meters long and 13.5 meters deep capable of handling panama vessels. This addition effectively makes Mombasa Container Terminal to have a total quay length of 840meters. In the same year, the construction of a second container terminal commenced in phases. Phase 1 was completed in February 2016 and started operating in April 2016, with a quay of 350 meters long berth and draft of 15 meters, and a side berth of 210 meters long with a draft of 12meters.

The Procurement & Supplies Department of Kenya Ports Authority is established pursuant to Section 2 of the Public Procurement & Asset Disposal Act 2015 and Regulation 8 of the Public Procurement & Disposal Regulations 2006. The Department is responsible for managing the procurement and asset disposal processes. Kenya Ports Authority has adopted e-procurement and there is need to focus on web security issues, web uptime tracking and supplier (external users) password control measures as these seem to be the major challenges prohibiting organizations from fully achieving their goals attributable to e-procurement. E-procurement adoption at Kenya Ports Authority has enabled the organization to redesign and improve business work processes radically but there is still need for initiatives that emphasize incremental improvement in the whole e-procurement process and output to cope with changes in the ever changing business environment.

Manual procurement system has been in use not only in the private sector but also in the government state corporations. Public procurement is an important function of government. Instead of satisfying requirements for goods, works, systems, and services in a timely manner, the Kenya procurement system had proved to be long, cumbersome and time consuming. This procurement system has had several deficiencies

that contributed to huge losses in public funds. It has also proved to be costly for both buyer and supplier or organizations, besides being regarded as a perpetrator of corruption.

However, (Callendar & Schapper, 2013), noted that a good procurement system has to meet the basic principles of good governance: transparency, fairness, value for money, accountability, economy and integrity. With these in mind, the government decided to introduce e-procurement in state corporations and the counties. With almost the entire world moving to digital life where almost everything is done online or is computerised, there is also need for institutions to move with the world so as to be at par with changes. Business organisations have moved from manual way of taking orders to online one. This makes quick delivery and also able to communicate faster.

Despite its benefits, e-procurement is also faced with several challenges which must be addressed. This problem hinders its adoption and implementation. Company culture and upper management support: points out that resistance to change, lack of a widely accepted solution and lack of leadership, which are cultural, are some of the biggest barriers to the introduction of e-procurement within the public sector. To counter this problem, points out that a cultural change needs to take place prior to adoption of an e-procurement system. People need to be appointed and backed with full senior management support in order to effect this change. Adequate sensitization on the system will greatly reduce the resistance to the change. It is the cultural change brought about by senior management support which can enable e-procurement is to be successfully implemented. Another challenge is uncertainty as to the legal position of e-procurement. Some organizations doubt whether electronically sent documents can be recognized by a third party as valid or legal. Lack

of IT infrastructure, is also another challenge of e-procurement. This was evident in the research carried out by Wong and Sloan (2014) as quoted in Eadie et al (2007) who noted that most companies lacked the relevant technology to carry out e-procurement.

The fourth challenge is the cost implications of the system. Some organizations perceive the system is too expensive to implement. Budgeting and costs, change management, as well as need of training and resources Harrigan (2008). Lack of e-procurement knowledge / skilled personnel is another barrier hindering smooth implementation of e-procurement. The older generation that has not kept up to the advances in IT related issues. This makes them rely heavily on traditional forms and means of procurement. The seventh challenge is lack of a business relationship with suppliers capable of e-procurement. Hawking et al, 2014 argues that lack of business relationships with suppliers showing the need for an e-procurement enabled supply chain as another barrier for the implementation of e-procurement.

Objectives of the study

- To determine the effect of top management support in the implementation of e-procurement at KPA.

- To establish the effect of budgetary allocation on the implementation of e-procurement at KPA.

- To determine the effect of staff proficiency in ICT skills on the implementation of e-procurement at KPA.

- To establish the effects of the level of technological infrastructure employed on e-procurement implementation at KPA.

RELATED LITERATURE

The concept of procurement

The academicians' interest on procurement started from the analysis of US procurement processes practiced by the Department of Defense (DOD) during the early part of the cold war. Peck and Scherer (1962) did an analysis of the Economic impact of procurement and coincidentally both the academician and the economic studies done were on the US defense procurement. The importance of procurement has been enormous since then in both the private and the public sector of any economy. According to Attaran (2002), procurement and e-procurement can be generalized into three categories; indirect procurement which is of non-production goods and services such as, office and computer supplies, maintenance repair and operating (MRO) supplies; Direct procurement which is of production goods and services such as raw materials, components and assemblies; Sourcing also as a form of procurement which involves the identification of potential supplier and the evaluation and negotiation of goods and services for both direct and indirect materials in the supply chain. This has not been automated in many organizations hence increased material costs and significant maverick spending. In recent times e-procurement of MRO goods is getting widely used. The procurement and supply activity of organizations is one which spans both internal service and B2B services. This is an important activity found in all organizations, public, private, governmental and charities and can be responsible for a large amount of spending. Such spending on, for example, materials components, facilities, subcontract capacity, IT equipment and supplies, consumables, stationery, travel and insurance can constitute a significant amount of money, Moozakis, (2001). This procurement process involves a series of activities aiming at striking the best deal in terms of price and quality. This process can range from: strategic buying which is mainly concerned with long term relationships between customers and suppliers. Transactional buying which implies repetitive purchases with the same vendor; spot buying whenever urgent requests come out and all the pre-qualified suppliers are not capable or are late in fulfilling them.

The concept of e-procurement

According to the Chartered Institute of Purchasing and Supply (CIPS), e-procurement is the combined use of electronic information and communications technology in order to enhance the links between customer and supplier, and with other value chain partners, and thereby to improve external and internal processes. E-Procurement is a key component of e-business and e-commerce. Elements of e-procurement include request for information, request for proposal, request for quotation, RFx (the previous three together), and eRFx (software for managing RFx projects).

A research by (Muffato and Payaro 2004), postulate that within e-procurement there are two main processes of procurement: procurement which includes specifications of the goods and services, notification of potential suppliers, tendering procedure, evaluation of tenders, agreement and acceptance and contract signature. The second part is fulfillment which include the activities of receiving the order, managing the transaction, delivery of the goods/services, acceptance of the goods/services, invoice and payment. Their research concludes by indicating that there is a potential spectrum of e-procurement which include six practices; e-Notification which involves an organization notifying potential supplier of future tendering activity. E-Tendering which encompasses an organization having the capability to electronically receive tender submissions from potential suppliers. They also identified e-Awarding which involves secure tender opening (e.g. being able to

open tenders that have been submitted by the closing date, time). E-Contracting which involves the establishment of an agreement with a supplier and normally arises from e-notification, e-tendering and e-awarding stages or can arise from other technology solutions like e-auction which typically involves supplier bidding for the supply of goods based on a tender specification prepared by an organization. Unlike conventional auctions (where generally price increases), e-Auctions are commonly referred to as reverse auctions as the price quoted by supplier generally decreases. Their research further concluded by adding e-Ordering and e-Invoicing. E-ordering is where an organization raises orders of agreed contracts or catalogues and there transmission and final acceptance by suppliers. Early e-procurement technology solutions focused on this aspect of e-procurement (e.g. EDI, e-catalogues and e-marketplaces) as this was perceived as the area where maximum efficiency could be achieved. E-invoicing is where invoices from suppliers are received electronically and further matching like with the purchase and goods received note is done, then the final payment is made. This wider and broader assessment of e-procurement by (Muffato and Payaro 2004) not only define e-procurement but also reflect the need to automate the current and largely manual procurement processes of any organization.

(Farzin and Nezhad 2010) asserts that e-procurement practices include activities such as advertising of tenders, electronic ordering, research into supplier markets, internet sourcing via third parties, electronic submission of tenders, electronic mail between buyers and sellers, electronic mail in contract management. Writers have classified e-procurement into three broad types;-transaction management to manage the requisition to payment process, brokerage such as using electronic exchanges and e-auctions, and electronic integration which may involve shared information systems in the supply chain, such as EDI or sharing computer aided systems (Kalakota and Robinson 2001). However different forms of e-procurement have also been classified according to the various procurement activities; six forms emerged (de Boer, Harink and Heijboer, 2002). They include e-ordering/e-Maintenance Repair Operate (MRO), web-based enterprise resource planning (ERP), e-sourcing, e-tendering, e-reverse auctioning/e-auctioning and e-informing.

The potential benefits and characteristics of e-procurement, especially for indirect goods and services, are described and proved in a huge number of articles and studies. According to Muffatto and Payaro, the main results are that e-procurement decentralizes operative tasks and centralizes strategic procurement processes. This eliminates the so-called maverick buying and reduces transaction costs (e.g. decreasing process time and media discontinuities or reducing personnel expenditures) and purchasing costs (e.g. through grouping effects and/or a reduction of the number of their suppliers).

The following are some of benefits regarding his theory:

Price Benefits- According to Shaw3, price benefits are derived as a result of better demand management capability of e-procurement systems. Web based systems provide a centralized and more accurate visibility of the enterprise-wide procurement of products and services. This helps to consolidate the demand at the enterprise-level and negotiate lower prices with suppliers. Procurement costs are reduced through economies of supplier search and increased price competition among suppliers.

Shortened Procurement cycle times: e-procurement has the ability to reduce resources currently involved in paper and manually based procurement processes through improved payment processes and decreased cycle time. Workflow - from producing a purchase request through to payment - can be managed electronically by e-

procurement processes, reducing errors and processing time. These efficiencies enable a reduced cycle time from requisition to payment. The Aberdeen Group estimates the time saved at 70 per cent. These timesaving allow reduced inventory levels, resulting in additional cost savings through better cash flow and lessened inventory carrying costs.

Reduced transaction and administration costs: The efforts (time, money and human resource) spent on carrying out any exchange become transaction cost (process or administration costs). The existence of transaction costs indicates a waste of time and efforts of purchasing personnel in non-value added activities, such as performing data entry and correcting errors in paperwork. Reduction in transaction cost is one of the most attractive benefits from e-procurement adoption;

Improved visibility of customer demand and supply chain: Companies that have successfully integrated E-Business into their operations can capture the full range of advantages E-Business provides, including stronger relationships with customers, distributors, retailers, suppliers, and business partners.

Reduced operating and inventory costs: According to Puschmann and Alt, e-procurement efficiency benefits consist of process, products and inventory savings. By adopting e-business, supply-chain cost reductions come from reduced levels of inventory, increased competition from suppliers and shorter cycle time in ordering.

Enhanced decision-making: Business benefits achieved through successful e-procurement initiatives include cost reductions, improved information, increased efficiencies, self-service approach, integrated supplier management and the strategic use of purchasing staff.

Procurement theories

Technology Diffusion Theory

TDT is the common lens through which theorists study the adoption and development of new ideas. Diffusion is defined basically as the process by which an innovation is adopted and gains acceptance by individuals or members of a community. The diffusion theory represents a complex number of sub-theories that collectively study the processes of adoption. The most famous account of diffusion research by Roger (1995) where the definition of diffusion of four elements which are defined as:

Innovation: an idea, practices or object perceived as new by individual or group of adopters. Time: the non-spatial interval through which diffusion event takes place. The events include innovation diffusion process, relative span of time for the individual or group to adopt the innovation and social systems. A set of interrelated units that are engaged in joint problem solving activities to accomplish the goals. Rogers (1995) also came up with the perceived attributes theory that assumes that innovation bears the following characteristics:

Relative advantage: degree in which an advantage is perceived as better than the idea it supersedes. Compatibility: degree that an innovation is seen to be consistent with existing values and norms. Complexity: the degree in which an innovation is seen to be difficult or easy to understand and use. Triability: the degree in which an innovation may be experienced on a limited basis and observability as the degree to which the results of innovation are visible to others. The earlier it is for individuals to see results of an innovation, the more likely they are to adopt it argues Roger (1995). Although the process is not limited to these perceived attributes, the elements are helpful in formulating questions for potential adopters in better understanding what factors make adoption possible or desirable.

Endogenous growth theory however indicates that the rate of technological progress, and hence the

long-run rate of economic growth, can be influenced by economic factors which will curtail technology adoption in procurement as technology is seen as being costly.

It starts from the observation that technology progress takes place through innovations, in the form of new products, processes and markets, many of which are the results of economic activities contends Lieberth (2007). Technological revolution has impacted on purchasing; the drivers for change in purchasing function must include the objectives of eradicating paper transactions to a secure system that facilitates procure to pay as an objective of a world class procurement which is seen to enhance the performance of the procurement function (Lysons & Farrington, 2012). The technology diffusion theory is important in guiding the firm to initiate change and adopt technologies in procurement in the shift toward world class procurement.

The Knowledge-Based Theory

The knowledge-based theory of the firm considers knowledge as the most strategically significant resource of the firm. Its proponents argue that because knowledge-based resources are usually difficult to imitate and socially complex, heterogeneous knowledge bases and capabilities among firms are the major determinants of sustained competitive advantage and superior corporate performance (Grant 2007). This knowledge is embedded and carried through multiple entities including organizational culture and identity, policies, routines, documents, systems, and employees (Zander 2010). The knowledge-based theory determines the nature organization human recourses capabilities which are mostly influenced by the nature of training given to the employees. Existence of professional trained staff in procurement field and availability of many staff with high education level plays an

important role in strengthening the organization capabilities in terms of trained manpower. The study thus used this theory to establish how an organization trains employees in order to equip them with knowledge that helps them to support effective implementation of procurement practices.

Agency Theory

Agency theory is concerned with agency relationships. The two parties have an agency relationship when they cooperate and engage in an association wherein one party (the principal) delegates decisions and/or work to another (an agent) to act on its behalf (Eisenhardt 2009; Rungtusanatham et al., 2010). The important assumptions underlying agency theory is that; potential goal conflicts exist between principals and agents; each party acts in its own self-interest; information asymmetry frequently exists between principals and agents; agents are more risk averse than the principal; and efficiency is the effectiveness criterion. Two potential problems stemming from these assumptions may arise in agency relationships: an agency problem and a risk-sharing problem (Xingxing 2012). An agency problem appears when agents' goals differ from the principals' and it is difficult or expensive to verify whether agents have appropriately performed the delegated work (i.e. moral hazard). This problem also arises when it is difficult or expensive to verify that agents have the expertise to perform the delegated work (i.e. adverse selection) that they claim to have. A risk-sharing problem arises when principals and agents have different attitudes towards risk that cause disagreements about actions to be taken (Xingxing 2012).

The assumptions and prescriptions of agency theory fit naturally with the issues inherent in supply chain quality management. In the process of managing supplier quality, buyers in agency relations are faced with potential problems. By their nature, buyers expect suppliers to provide good quality and

to improve the quality of supplied products and/or services, but suppliers may be reluctant to invest substantially in quality, especially if they perceive that buyers are reaping all the benefits. The difference between buyers and suppliers will result in the two parties concerning themselves only with their self-interests (Xingxing 2012). Agency theory determines how procurement managers execute procurement practices on behalf of their institutions. Existence of poor principal-agent relationship leads to low level of top management commitment and this also affects the relationship between institutions and the suppliers.

Existence of conflict of interest amongst the agents leads to execution of procurement practices against the procurement policies and this leads to increased procurement budget and loss of procurement funds.

Institution Theory

The history of institutional theory can be traced back to its early development in economics, political science, and sociology (Scott, 2008). This theory sees institutions as multifaceted, durable social structures made up of symbolic elements, social activities, and material resources. Institutions, however, are not just constraint structures but also simultaneously empower and control (Jepperson, 2011). According to Wijen & Ansari (2007), there are three 'schools' within institutional theory: 'old institutionalism' that focuses on issues of agency, vested interest, power, and informal structure; 'new institutionalism' that stresses structural constraints, embeddedness, and isomorphism; and 'institutional economics' that emphasizes human agency in constructing institutions that structure political, economic, and social interaction. These rich concepts provide useful insights into not only the persistence and the homogeneity of institutions but also institutional change and transformation (Dacin et al., 2012). Institutional theory has been used as a lens in different areas of information systems research. Most of the researchers using this theory believe that information technology (IT) it is an insufficient predictor of IT impact on organization performance improvement (Avgerou, 2000; Orlikowski & Barley, 2011). Avgerou (2000, p. 234) suggest that, 'IT innovation itself is a process of combining technical -rational and social forces, neither driving, nor subsumed in the forces of organizational change, but interacting with them'. IS scholars should take into account the institutional context where IS is developed and implemented (Orlikowski & Barley, 2001). In addition, institutional theory is also used to portray the relationship between actors and to explain isomorphic mechanisms between the actors which emerge during the IT implementation (Gil-Garcia & Martinez-Moyano, 2007; Kim et al., 2009). In the literature, there are various different mechanisms of institutional change. These included structural overlap and event sequencing (Thornton & Ocasio, 2008). Both structural overlap and event sequencing were not prevalent in this case of eProcurement implementation. Mergers and acquisition are examples of structural overlap (Dorado, 2005); and these were not the case in this study. Therefore, this study will focus only on three of the mechanisms, i.e., institutional isomorphism (DiMaggio & Powell, 1983; Frumkin &Galaskiewicz, 2004), competing institutional logics, and institutional entrepreneurs (Thornton et al., 2005; Thornton & Ocasio, 1999). Institutional isomorphism occurs when an institution has to respond to various external pressures (DiMaggio &Powell, 2013). Institutional entrepreneurs are actors who are taking advantage of the position to mobilize support and resources to create and empower institutions (DiMaggio, 2008). Competing institutional logics can both hinder and trigger institutional change (Nielsen & Jensen, 2011; Sahay etal, 2010; Thornton et al., (2010).
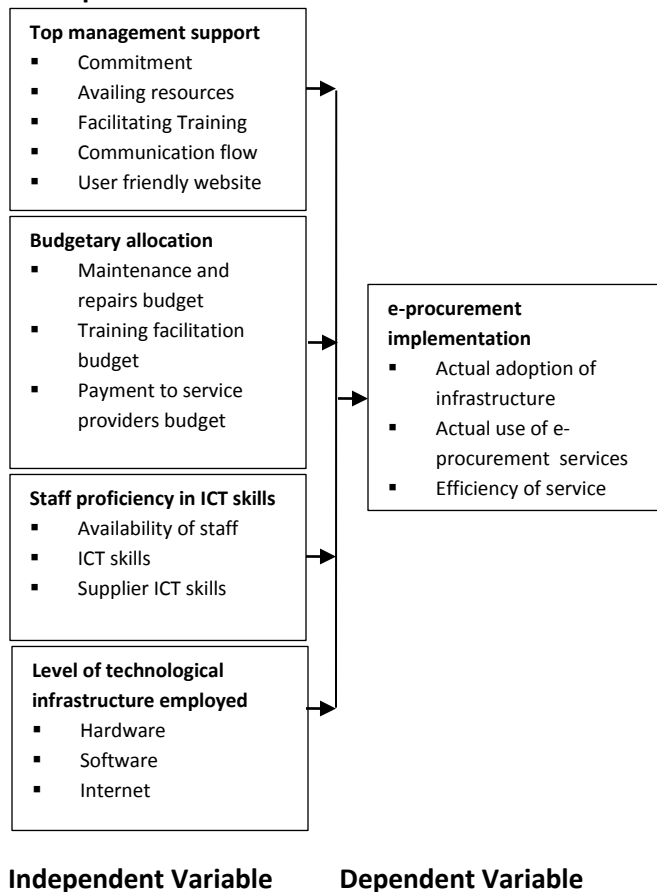
Conceptual Framework

Top management support
- Commitment
- Availing resources
- Facilitating Training
- Communication flow
- User friendly website

Budgetary allocation
- Maintenance and repairs budget
- Training facilitation budget
- Payment to service providers budget

Staff proficiency in ICT skills
- Availability of staff
- ICT skills
- Supplier ICT skills

Level of technological infrastructure employed
- Hardware
- Software
- Internet

e-procurement implementation
- Actual adoption of infrastructure
- Actual use of e-procurement services
- Efficiency of service

Independent Variable   Dependent Variable

Fig. 1: Conceptual Framework.

Extent of Top Management Support

Like any other technological change, e-procurement brings change in an organization that requires organizational managers to adopt management strategies towards making the transformation process success procurement Action Plan, (2015). One way in which managers in organizations can reveal commitment to change is to have change management team structures that identifies who is doing the change management work (Yildirim, Soner., 2000).

According to Andersen, K. V., (2014) change management structures outline the relationship between the project team and the change management team. Dean further adds that the most frequent team structures include: - change

management being a responsibility assigned to one of the project team members or an external change management team supporting a project team. The key in developing the strategy is to be specific and make an informed decision when assigning the change management responsibility and resources Organization for Economic Co -operation and Development, (2009).

Most major e-procurement initiatives are driven by top management. It's not unusual for a Chief Executive Officers (CEO) to be directly involved in the early stages of the process. One often unexpected demand of implementing an e procurement strategy is the requirement for new management techniques and specialized skills among the organization's management team as (Thomas et al 2008) argues. Managerial commitment towards e-procurement implementation has also been discussed by scholars concerning the style of leadership adopted by many managers. According to Kippis (2007) almost all managers of African organizations, perhaps because of societal norms and expectations emphasize bureaucratic practices with total reliance on rules and regulations that workers obey without questioning or offering constructive criticism (Alpar P. and Olbrich S, 2005).

Bureaucratic practices usually create a very cold and impersonal organizational climate. Most of them are unconducive to attainment of organizational goals Workers in such organizations behave like robots. The impersonal and legalistic environment according to kippis (2007) alienates workers from both their job and organization. Managers patronizing attitude towards employees may hinder from being innovative or adoptive to a change idea such as shifting from manual procurement to eprocurement that could be of benefit to the organizations. A study by Ndongko (2015) on Cameroon public service institutions revealed that

despite the culture which emphasizes on rigid hierarchical relationships, managers who were seen by workers to be democratic in their techniques of management and such exerted low control over them elicited higher levels of adopting new changes within the organization compared to authoritarian ones.

Implementation of e procurement which is at time associated with change might require managers to commit themselves in realizing the importance of their employees in making the adoption a success. A study by Howell (2015) on Liberian workers and that by Greenhouse (2010) showed a considerable similarity exist in the work goals of employees around the world and that national differences regarding job related objectives were not as great as people thought. The findings of these studies indicate that human needs are universal, for workers to be motivated in adopting new ideas in an organization, it is important that organizational managers show commitment to motivate the work force and improve quality of work life. This will ease implementation of new technologies

Budgetary allocation

Budgeting is a tool for planning and controlling finances by both private individuals/ establishment and government. In the process, there is a wise selection of essential activities to be executed. It is also the process by which scarce resources are allocated in the most efficient manner to address most important needs and problems.

Budgets are formulated to achieve certain prime objectives such as to reduce inflationary pressures, to sustain growth and development, increase employment opportunities, reduce poverty and to meet individual set goals. It could also be aimed at developing a specific subsector (or sector), or a certain group of subsectors, or indeed an aspect of the economy, to achieve a specific goal.

As a tool for planning and controlling finances, budgets are formulated to achieve certain prime objectives such as to reduce inflationary pressures, to sustain growth and development, increase employment opportunities, reduce poverty, etc. It could also be aimed at developing a specific sector, or a certain group of subsectors, or indeed an aspect of the economy, to achieve a specific goal.

The accounting officer of the institution should set aside funds meant for the implementation of e-procurement. Such funds could be used in the maintenance and replacement of the systems and hardware; payment of service providers; and payment of consultants if the need arises.

Staff proficiency in ICT skills

According to (Adelman, 2000) Information Technology (IT) is the acquisition, processing, storage, and dissemination of vocal, pictorial, textual, and numerical information by micro electronic based combination of computing and telecommunication. The human capacity in using Information Technology (IT) may play a vital role in implementation of e-procurement in public procuring entities. Employees must understand how to use ICT and how it will change the way they do business. This obstacle is more prominent for advanced ICT such as e-commerce, and ERP software than for basic ICT such as phone lines and fax. A response from one of the managers in a study carried out by Macmanus, (2012) indicated that, Lack of competences, need of training and absence of motivation in many public procurement officers, are some of the main reasons for which any new projects, new tools like e-Procurement are hardly implemented and hence the need to improve the already existing bureaucratic standards in public institutions.

Study by (Sivin-Kachala, 2008) showed that the people's perception about technology rarely brings

out the best out of many employees in public organizations'. In his study Sigel explains that technology has become closely associated with gadgets that enhance economic development through efficient mass production of goods. However to many technology remains a concept that is best left to engineers, scientists and the technically inclined since they believe its mastery requires long tedious hours of solitary work in laboratories or in isolated rooms of big machines. It therefore appears to be unquantifiable, uncontrollable and intangible to many including the very people especially the managers who can make serious decisions on it.

Further study by (Priest, 2010) shows that information technology in its simplest and most complex forms are essentially specialized knowledge, skills and tools. Priest further adds that there is a general feeling of helplessness among many employees in procuring entities due to their inability to use appropriate technology to further the goals of their organizations and this makes majority of them shun away from implementing e procurement due to the uncompetitive nature of procuring entities, employees may be reluctant to innovativeness that is usually witnessed in private institutions. Empirical studies have shown that competitiveness increases the likelihood of innovation and implementation. Competition lead to environmental uncertainty and increases both the need and rate of implementation, However (Taylor & Todd, 2010) observes, the reluctant nature of procuring entities may lead to employees reluctance in learning and using new technologies associated with e procurement.

Availability of infrastructure

Implementation of e procurement usually involves using advanced communication technologies such as email and the Internet. Having an online presence creates important new methods of procurement for public procuring entities. Procuring entities have the role to create e procurement platforms in which stakeholder in the procurement department can sign in (Henriksen & Mahnke, 2005). Information Communication Technologies consists of a combination of hardware and software technologies. Hardware components are important for knowledge management system because they have the role of platform for the software and transfer of knowledge. Some of the hardware requirements include personal computers or workstations to facilitate the access to knowledge, servers for high traffic for the organization to be in network, open architecture for interoperability in distributed media, mass media rich in application that need integrated digital network of services and high speed optic fibre to offer access to public network email letter to the address provided at the site" and "the use of technology to enhance the access to and delivery of government services to benefit citizens, business partners and employees. Davis, (1989) developed technology acceptance model (TAM) based on the previous works by on Fishbein and Ajzens theory on reasons of actions (1975) to explain the intentions of use of IT and in organizations in the TAM model, ease of use and usefulness are two independent variables explaining attitude, behavioral intentions and actual use Taylor and Todd later showed that the TAM model is well suited to predict variation in adoption and use of IT in organizations. Usefulness and ease of use are important factors in the use of information system.

Research by the Aberdeen Group (2001) cited user adoption as an essential factor in successful e-procurement deployment. Lin & Hsieh (2000) used a single case study to highlight the importance of both web content management and content rationalization as significant issues for e-procurement operation. They noted that constantly changing prices, specifications and account details

across the (on-line) supply base caused major problems in the maintenance of supplier catalogues. In addition, the way an item is described (item coding) has been found to be significant data management issue for e-procurement, and Lin & Hsieh also claim that material code proliferation within ERP systems has posed similar challenges for the management of IS infrastructure.

The extent to which the e-procurement system is able to integrate effectively with other IS, particularly production planning & control and finance systems, is posited by Subramanian& Shaw (2000) to be a major casual determinant of the efficiency and effectiveness of an e-procurement implementation, both with the customer's information infrastructure and in its links with suppliers.

METHODOLOGY

The research design used was a case study of KPA. Case studies try to pull together a wide variety of issues about the defined case, then present the information as a unified whole. The estimated regression model for this study involving the four independent variables and one dependent variable therefore is:

$Y = \beta 0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$

Where;

β_0 = Regression constant

β_1 = availability of funds (X_1),

β_2 = human resource capacity (X_2),

β_3 = top management support (X_3)

β_4 = availability of infrastructure (X_4)

are regression coefficients of the four independent variables; and respectively.

Y= efficiency of procurement practices as a result of adopting and implementing e-procurement

ε = error term

RESEARCH FINDINGS

Effect of top management support on the implementation of e-procurement at KPA

The respondents were requested to indicate how top management support affects the implementation of e-procurement on a likert scale. The range was 'strongly disagree (1)' to 'strongly agree' (5). The scores of strongly disagree and disagree have been taken to represent a variable which had a mean score of 0 to 2.5 on the continuous likert scale; (0≤ S.D<2.4). The scores of 'neutral' have been taken to represent a variable with a mean score of 2.5 to 3.4 on the continuous likert scale: (2.5 ≤N<3.4) and the score of both strongly agree and agree have been taken to represent a variable which had a mean score of 3.5 to 5.0 on a continuous likert scale; (3.5≤ S.A.<5.0). A standard deviation of >0.7 implies a significant difference on the impact of the variable among respondents. The results are presented in table 1.

Table 1: Top management support

Top management support	Mean	Std. Deviation
Lack of training	3.60	.551
Unfriendly website	4.19	.691
Lack of proper communication flow	4.03	.913
Lack of commitment	3.89	.802
Availing necessary resources	4.01	.696
Average Mean	3.944	

From the table 1 the results obtained from the survey on the respondents to find out the effect of top management support on implementation of electronic procurement show that the average

mean was 3.944 which implied that top management support has major effect on implementation of e-procurement. This is because the average mean ranged between 3.5≤ S.A.<5.0 which was rated "Strongly agree".

Effect of budgetary allocation on the implementation of e-procurement at KPA

The respondents were requested to indicate how budgetary allocation affects the implementation of e-procurement in a likert scale. The range was 'strongly disagree (1)' to 'strongly agree' (5). The scores of strongly disagree and disagree have been

taken to represent a variable which had a mean score of 0 to 2.5 on the continuous likert scale; (0≤ S.D<2.4). The scores of 'neutral' have been taken to represent a variable with a mean score of 2.5 to 3.4 on the continuous likert scale: (2.5 ≤N<3.4) and the score of both strongly agree and agree have been taken to represent a variable which had a mean score of 3.5 to 5.0 on a continuous likert scale; (3.5≤ S.A.<5.0). A standard deviation of >0.7 implies a significant difference on the impact of the variable among respondents. The results are presented in table 2.

Table 2: Budgetary allocation

Budgetary allocation	Mean	Std. Deviation
Maintenance and repairs budget	4.12	.654
Training and facilitation budget	4.25	.833
Payment to service providers budget	3.75	.667
Average Mean	4.04	

From the table 2 the results obtained from the survey on the respondents to find out the effect of budgetary allocation on implementation of electronic procurement show that the average mean was 4.04 which implied that budgetary allocation has major effect on implementation of e-procurement. This is because the average mean ranged between 3.5≤ S.A.<5.0 which was rated "Strongly agree". Therefore budgetary allocation has a major effect on implementation of e-procurement at Kenya Ports Authority.

Effect of Staff Proficiency in ICT Skills on the Implementation of e-procurement at KPA

The respondents were requested to indicate how staff proficiency in ICT skills affects the

implementation of e-procurement in a likert scale. The range was 'strongly disagree (1)' to 'strongly agree' (5). The scores of strongly disagree and disagree have been taken to represent a variable which had a mean score of 0 to 2.5 on the continuous likert scale; (0≤ S.D<2.4). The scores of 'neutral' have been taken to represent a variable with a mean score of 2.5 to 3.4 on the continuous likert scale: (2.5 ≤N<3.4) and the score of both strongly agree and agree have been taken to represent a variable which had a mean score of 3.5 to 5.0 on a continuous likert scale; (3.5≤ S.A.<5.0). A standard deviation of >0.7 implies a significant difference on the impact of the variable among respondents. The results are presented in table 3.

Table 3: Proficiency in ICT Skills

Proficiency in ICT Skills	Mean	Std. Deviation
Availability of staff	3.89	.842
Staff with ICT skills	4.01	.746
Supplier with ICT skills	3.81	.746

Average Mean	3.90

From the table 3 above the results obtained from the survey on the respondents to find out the effect of staff proficiency in ICT skills on implementation of electronic procurement show that the average mean was 3.90 which implied that staff proficiency in ICT skills has major effect on implementation of e-procurement. This is because the average mean ranged between 3.5≤ S.A.<5.0 which was rated "Strongly agree". Therefore staff proficiency in ICT skills has a major effect on implementation of e-procurement at Kenya Ports Authority. There were major discrepancies among the respondents since all the standard deviations were greater than 0.7. This could be associated with lack of education among the respondents and the majority aged. There could be technology phobia among the aged and low learned employees.

Effects of the level of technological infrastructure employed on e-procurement implementation at KPA.

The respondents were requested to indicate how the level of technological infrastructure affects the implementation of e-procurement in a likert scale. The range was 'strongly disagree (1)' to 'strongly agree' (5). The scores of strongly disagree and disagree have been taken to represent a variable which had a mean score of 0 to 2.5 on the continuous likert scale; (0≤ S.D<2.4). The scores of 'neutral' have been taken to represent a variable with a mean score of 2.5 to 3.4 on the continuous likert scale: (2.5 ≤N<3.4) and the score of both strongly agree and agree have been taken to represent a variable which had a mean score of 3.5 to 5.0 on a continuous likert scale; (3.5≤ S.A.<5.0). A standard deviation of >0.7 implies a significant difference on the impact of the variable among respondents. The results are presented in table 4.

Table 4: Technological Infrastructure

Technological Infrastructure	Mean	Std. Deviation
Hardware	3.99	.879
Software	4.22	.899
Internet availability and reliability	3.65	.610
Average Mean	3.95	

From the table 4 above the results obtained from the survey on the respondents to find out the effect of technological infrastructure on implementation of electronic procurement show that the average mean was 3.95 which implied that technological infrastructure has major effect on implementation of e-procurement. This is because the average mean ranged between 3.5≤ S.A.<5.0 which was rated "Strongly agree". Therefore technological infrastructure has a major effect on implementation of e-procurement at Kenya Ports Authority. There were major discrepancies among the respondents since hardware and software standard deviations were greater than 0.7. This

could be associated with lack of education among the respondents and the majority aged. There could be technology phobia among the aged and low learned employees even if KPA has invested in technological infrastructure.

Electronic Procurement Implementation

This study sought to find out electronic procurement implementation as a dependent variable and its relationship with the independent variables in a likert scale.. The range was 'strongly disagree (1)' to 'strongly agree' (5). The scores of strongly disagree and disagree have been taken to represent a variable which had a mean score of 0

to 2.5 on the continuous likert scale; (0≤ S.D<2.4). The scores of 'neutral' have been taken to represent a variable with a mean score of 2.5 to 3.4 on the continuous likert scale: (2.5 ≤N<3.4) and the score of both strongly agree and agree have been taken to represent a variable which had a

mean score of 3.5 to 5.0 on a continuous likert scale; (3.5≤ S.A.<5.0). A standard deviation of >0.7 implies a significant difference on the impact of the variable among respondents. The results are presented in table 5.

Table 5: Electronic Procurement Implementation

Electronic Procurement Implementation	Mean	Std. Deviation
Actual adoption of infrastructure	3.96	.907
Actual use of the e-procurement services	3.93	.844
Internet availability and reliability	4.03	.724
Average Mean	3.97	

From the table 5 the results obtained from the survey on the respondents to find out the electronic procurement implementation show that the average mean was 3.97 which implied that electronic procurement implementation had a very high effect on KPA's prosperity. This is because the

average mean was between 3.5≤ S.A.<5.0 which was rated "strongly agree". The standard deviation was greater than 0.7, an indication that there were many discrepancies on the impact of the variables among the respondents.

Table 6: Summary of the factors affecting implementation of e-procurement

Factors affecting implementation of e-procurement	Average Mean
Top Management support	3.944
Budgetary allocation	4.04
Staff proficiency in ICT skills	3.90
Level of technological infrastructure	3.95
Electronic procurement implementation	3.97

The results in table 6 indicate that the factors affecting implementation of electronic procurement as considered by Kenya Ports Authority were top management support (average mean 3.944), budgetary allocation (average mean 4.04), staff proficiency in ICT skills (average mean 3.90) and level of technological infrastructure (average mean 3.95). This study shows that budgetary allocation was the highly rated factor affecting the implementation of electronic procurement followed by level of technological infrastructure, top management support and lastly staff proficiency in ICT skills. There was high variation of standard

deviation in some of the variables. This indicated that the respondents had discrepancies on the factors affecting implementation of electronic procurement at Kenya Ports Authority. Technological infrastructure had the highest standard deviation which was an indication that the respondents had variations in terms of their responses.

Regression Analysis

The factors affecting implementation of electronic procurement at Kenya Ports Authority were

investigated from the results of the respondents. From Table 7 below, the established multiple linear regression equation becomes:

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

$$Y = .536 + .683X1 + -324X2 + .272X3 + .250X4$$

Table 7: Results of general least square

Model 1	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	.536	.342		1.565	.119
Top management Support	.683	.086	.481	7.953	.000
Budgetary allocation	-.324	.087	-.223	-3.730	.000
Staff proficiency in ICT skills	.272	.062	.285	4.396	.000
Level of technological	.250	.069	.238	3.647	.000

The intercept of the vertical axis has a value (0.536) and means that that the point where the independent variables are zero then the implementation will be negative. The coefficient of the independent variables is positive except the budget allocation and implies that the increase in the independent variables results in an increase in implementation of electronic procurement at KPA. From the coefficients, it can be deduced that the most critical factor affecting the implementation of electronic procurement is budget allocation which affects at a higher rate than other variables.

Table 8: Bivariate Pearson coefficient

		Top_management_support	Budgetary_allocation	Staff_proficiency_in_ICT_skills	Level_of_technological	e_procurement_implementation
Top_management_support	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	195				
Budgetary_allocation	Pearson Correlation	.431[**]	1			
	Sig. (2-tailed)	.000				
	N	195	195			
Staff_proficiency_in_ICT_skills	Pearson Correlation	.479[**]	.293[**]	1		
	Sig. (2-tailed)	.000	.000			
	N	195	195	195		
Level_of_technological	Pearson Correlation	.359[**]	.473[**]	.561[**]	1	

	Sig. (2-tailed)	.000	.000	.000	
	N	195	195	195	195
e_procurement_implementation	Pearson Correlation	.607**	.180*	.583**	.465**	1
	Sig. (2-tailed)	.000	.012	.000	.000

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

*. Correlation is significant at the 0.05 level (2-tailed).

Pearson correlation test conducted to examine whether there was a relationship between independent and dependent variables revealed that there was a significant relationship between the variables though budget allocation was the highest factor affecting implementation of electronic procurement.

Table 9: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F-statistic
1	.727[a]	.529	.519	.38506	

The $R2$, also called the coefficient of determination, is the percentage of the variance in the dependent variable explained uniquely or jointly by the independent variables and is 72.7 %.

This means that 72.7 % of the changes in the KPA's implementation of electronic procurement are explained by the changes in the independent variables in the model. The remaining 27.3% of the changes in the Y is explained by other factors not in the model. The C is the constant, where the regression line intercepts the y axis, representing the amount the dependent y will be when all the independent variables are 0. Here C is .536; the probability of the coefficient is significant. The F statistic is used to test the significance of R.

CONCLUSION

The broad research questions relating to the factors affecting implementation of electronic procurement was studied and the findings were analysed so as to draw conclusions. The study established that electronic procurement implementation was affected by various factors which include budgetary allocation, level of technological infrastructure, top management support and staff proficiency in ICT skills.

In establishing the effect of top management support on the electronic procurement implementation, it was concluded that commitment and availing resources plays a very major role in determining the proper implementation. Lack of support leads to poor service delivery translating to more cost incurred, wastages and this could mean loss of business to a competitor.

The research also indicated that the Kenya Ports Authority considers the facilitating training and user friendly hence becoming competitive with other ports in East Africa and other regions.

The right budget is allocated to for maintenance and repairs, training facilitation and payment of services to the suppliers and other clients.

Implementation of electronic procurement is a reserve of the top management hence it can be used to improve some of the dimensions of organization's performance. This is evident especially in resource allocation as contained in the

annual management plans generated by every department. However, with the fluctuation in prices, increased number of ports in Africa and lack of support from the government, the institution is forced to adjust its budget most of the time.

Most of the respondents had not studied beyond a secondary school certificate this gives the impression that they are not tech savvy hence there could be technology phobia among them.

There is need for KPA to introduce regular staff training on matters ICT to enhance the implementation of e-procurement.

Most of the respondents believed that the level of infrastructure employed affected the implementation of e-procurement. But there were differenced amongst the staff as it pertains softwares and hardwares and the researcher believed that this was a result if the difference in education level by staff. KPA management should therefore ensure that the technology employed at the organization can be used efficiently by staff to enhance service delivery.

RECOMMENDATIONS

The study established that the company is faced with issues to do with top management support, like lack of empowering employees, and those in management exercising their powers negatively and lack of resources for implementation of electronic procurement. It is therefore recommended that the organization should put all measures in place to ensure that they do not face severe losses as a resulting from lack of managerial support.

KPA should maximize on its human capital as it most priced asset. The research identified that majority of its staff are not educated and it should therefore employ qualified staff to implement electronic procurement.

The study found out that implementation of electronic procurement at KPA was affected by factors resulting from lack of ICT skills by its staff and it is therefore recommended that the organization should have adequate training of all the employees involved in electronic procurement so that they can secure added value and continuous improvement.

The organization should employ the current technology in the market by acquiring up to date softwares.

Recommendations for Further Research

The study was done at Kenya Ports Authority which is a government parastatal. This research therefore should be replicated in other government parastatals and the results be compared so as to establish whether there is consistency among different industries in Kenya on the factors affecting implementation of electronic procurement.

Future researchers should also embark on researching the impacts associated with electronic procurement and factors inhibiting implementing electronic procurement in both private and public sectors.

Lastly future researchers should research on factors influencing adoption of electronic procurement in both private and public sectors.

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