

# **ROLE OF E-PROCUREMENT ADOPTION ON PROCUREMENT PERFORMANCE IN STATE CORPORATIONS IN KENYA: A CASE OF KENYA UTALII COLLEGE**

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## **ABSTRACT**

Due to remarkable improvement noted in procurement performance owing to the adoption of e-tendering, e-award, e-ordering and e-invoicing as main electronic procurement procedures; e-procurement has been heralded as a revolution in the e-market place; and as such, has been rapidly adopted by many private corporations. Faced with persistent public complaints over dismal procurement performance; an increasing number of state corporations are beginning to adopt e-procurement solution in order to realize its promises that have already been achieved by many private sector firms, especially in the developed world. In line with the global trend, Kenyan state corporations are confronted with problems of poor service delivery, high cost of procurement, increased procurement lead-time and non-compliance with procurement policy. As one of the state corporations, Kenya Utalii College (KUC) has not been spared by these problems. Thus, employing KUC as a case study; the overall aim of this study was to examine the role of e-procurement adoption on procurement performance in state corporations in Kenya. The study objectives were to determine the role of e-tendering on procurement performance; assess the role of e-awarding on procurement performance; examine the role of e-ordering on procurement performance and to establish the role of e-invoicing on procurement performance in state corporations in Kenya. The target population of the study was one hundred and twenty (120) employees working at KUC in the level of departmental head, immediate supervisor and lower cadre employees. A

sample of 55 employees in the corporation was taken out of this sampling frame. Data was collected through questionnaires. Fifty five (55) questionnaires were administered within KUC; out of which forty eight (48) were returned. Analysis of the data on demographic information was done using frequency and percentage tables. Mean and standard deviation were used to analyze e-tendering, e-award, e-ordering and e-invoicing adopted by state corporations; correlation analysis was used to measure the degree of association between the dependent and independent variables; regression analysis was conducted to determine the statistical significance between the independent variables and dependent variable. Finally, the ANOVA test was used to determine whether the model employed in the study is important in predicting the procurement performance. The study revealed that state corporations have adopted e-tendering, e-award, e-ordering and e-invoicing to some extent in order to enhance their procurement performance. The regression analysis conducted revealed that the respective e-procurement procedures adopted had a significant influence on the procurement performance of state corporations. Results show that the implementation of e-procurement has developed substantially during recent years, but state corporations in Kenya have still not yet adopted and utilized e-procurement to its full potential. The study recommends that the government should come up with holistic system integration and technological standards; develop legal framework and government policy that makes it mandatory for all bidders to adopt e-procurement;

install a solid system security and authentication among State Corporation; and finally, develop a comprehensive e-procurement implementation strategy and ensure adoption of the same by all state corporations in Kenya. The study reiterates the need for further research to be conducted on the institutional responses to e-procurement adoption among state

corporations in Kenya; and finally, the factors affecting the uptake and usage of e-procurement initiative within state corporations in Kenya. The study was constrained by uncooperative respondents and policy on confidentiality.

**Key Words:** *e-procurement, procurement performance, state corporations, Kenya Utalii College*

## **INTRODUCTION**

In all countries in the world, the financial activities of government procurement managers accounts for 10% – 30 % of GNP (Amemba, et al, 2013; Callender & Mathews, 2000). Similarly, studies reveal that state corporations usually spend upto 70% of their revenue/operational budget on purchasing goods and services (Rahim, 2008; Gebauer & Segev, 1998). Despite such significance, procurement function in the public sector still suffers from four protracted hitches: First, traditional procurement process permits infamous maverick buying practice which represents a situation where employees make unplanned purchases from non-preferred suppliers at a higher price (Rahim, 2008; Turban, et al, 2008); second, procurement policies are not well developed and hence adopting the same becomes a serious challenge; third, series of bureaucracy in the procurement process giving rise to poor service delivery; and finally, procurement is traditionally a labor-intensive activity and, as such, managers spend considerable time on ‘non-value-added activities’ (Rahim, 2008; Croom & Brandon, 2005; Roche, 2001).

Within the private sector a significant amount of research has been carried out into the benefits that can be accrued from e-procurement, should it be successfully adopted. Identified benefits include: enhanced relationships with suppliers; reduced order cycle times; reductions in the cost of placing orders; the stream-lining of the supply-chain, and greater compliance with standards (Subramaniam & Shaw, 2004; Croom and Johnston, 2003; Hawking and Stein, 2004).

However, it is not just the private sector that is likely to benefit from the adoption of e-procurement capabilities, as there is also the potential for state corporations to gain significantly (Croom & Brandon, 2007). Despite all of the efficiencies that can be realized through public 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 (Devadoss, 2003; Mitchell, 2000).

Globally, most procurement executives remain unsure about how to implement e-procurement effectively. Based on a field study of 26 firms with business operations in Asia, Hsao & Teo (2005) suggested a three-stage model for implementing e-procurement. This include: firstly;

assess e-procurement's match with your firm's purchasing practices; secondly, determine your operational and strategic objectives; and finally, overcome the 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; regulatory difficulties (Trkman and McCormack, 2010).

Acceptance of e-procurement systems by employees working in the state corporations is important to ensure improved organizational effectiveness (Subramaniam & Shaw, 2004). Although a rich body of literature exists regarding the organizational adoption decisions of e-procurement systems and their impact on organizational performance, little is however known about the factors that affect the acceptance of these systems by employees working in organisations. As such, the following factors have been identified: perceived usefulness, perceived ease of use, employee involvement, reliability, customized training, vendor support and management support (Rahim, 2008).

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 GDP, respectively (Kamotho, 2014; Malela, 2010; PPOA, 2007). Before then, there was overwhelming concern that this area was neglected for long and as such, the government was not realizing value for money amongst its state corporations. This saw the need to revamp public procurement in Kenya by instituting a number of reforms aimed at enhancing efficiency in the procurement process. Major reforms in the procurement system in Kenya started with the establishment of the legal framework within which public procurement could be carried out (Miheho, 2013).

Originally, the procurement system was anchored on the supplies manual of 1978, which was supplemented by the Kenyan government circulars that were issued from time to time. The first review of the procurement system was undertaken in 1999 and established a number of issues contributing to poor procurement performance among state corporations. These issues included: lack of uniform procurement system and standard procurement policy; lack of sanctions or penalties against persons who breached the regulations in the supplies manual; application of the rules was not strict and as such, many of the norms were not followed; there was lack of transparency and accountability in the procurement process thus contributing to huge losses of public funds (Mambo, 2015 and Malela, 2010).

In order to address the fore mentioned obstacles in the procurement system in Kenya; public procurement and disposal bill was drafted between the year 2001 and 2004; and later on enacted in the year 2005 thus became the Public Procurement and Disposal Act 2005 (PPDA, 2005). Similarly, in order to enhance the provision of the Act, public procurement regulations was legislated in the year 2006 (PPDR, 2006). These two legislations became operational across the

entire public sector entities in Kenya in the year 2007. In spite of the above solid legal framework; cases of graft, inefficiency of service delivery, inflated cost of procurement; long procurement cycle time and non-compliance with the legal provisions were on the rise among state corporations. As such, there has been a lot of public outcry on the need to address these vices. Having learnt from the success stories among state corporations in the global arena, the government of Kenya saw the need to adopt e-procurement amongst its state corporations with the aim of modernizing and enhancing their procurement performance (Kiage, 2013).

Further reforms touched the introduction of high speed and high capacity fiber optic cable which was meant to boost the efficiency of internet thus making e-procurement a reality (ROK, 2009). Similarly, the integrated financial management information system (IFMIS) was also introduced as a major instrument to bolster e-procurement solution and to improve governance of Ministries and Departments (Miheho, 2013). To this end, the government of Kenya considers ICT as a key pillar in the success of vision 2030 which aims at transforming the country into an industrialized nation by the year 2030. Being one of the medium term objectives which were to be implemented by June 2007, e-procurement adoption among state corporations has been alarmingly very slow (Makau, 2014; Malela, 2010).

Studies by Chang, (2011) revealed that in the year 2010, over 60% of Korea's total public procurement (124 billion USD) was conducted through e-procurement system. As a result, procurement performance of state corporations in Korea were greatly improved; thus yielding short procurement cycle-time, higher efficiency in service delivery, lower cost of procurement and enhanced policy compliance. In contrast to this, studies indicate that more than 50% of procurement processes in state corporations in Kenya are still being carried out manually; with the internet only being used for e-mails and web browsing (Malela, 2010; Miheho, 2013; Makau, 2014). Thus, it was critical to establish the role of e-procurement adoption on procurement performance in state corporations in Kenya; with specific reference to Kenya Utalii College, as a state corporation.

Kenya Utalii College (KUC) is a hotel and tourism training institution; with a vision of being a globally recognized and transformative premier tourism and hospitality training centre. The institution was established in 1975 with technical and financial assistance from the government of the Swiss Confederation, through its agents Messrs. Tourist consultant, of Basel, Switzerland. KUC joined the list of state corporations in Kenya in 1987.

State corporations are formed and owned by the government in order to meet both commercial and social goals which include: correcting market failure, exploiting social and political objectives, providing education, health, redistributing income and developing marginal areas (Mwangi, 2013; Njiru, 2008). State corporations in Kenya are divided into 8 broad categories based on their mandate and functions. These categories include: financial corporations, commercial corporations, regulatory corporations, public universities, service corporations, regional development authorities, tertiary education and training corporations and finally training

and research corporations (Mwangi, 2013). As one of the state corporation in Kenya, KUC is categorized under tertiary education and training corporations. As such, it was expected to exercise the powers conferred by the Kenyan law in section 29(1) of the Hotel and Restaurant Act (Cap 494).

KUC has a legacy in offering training and consultancy services for the hospitality and tourism industry. Currently, the corporation has got three branches spread across the country. These include: Mombasa campus, Kisumu Campus and Main Campus in Nairobi. The policy making body of KUC is the Board of Governors. The corporation is guided by public procurement and asset disposal Act, 2015; government policies, rules and regulations in conducting its procurement activities. As such, KUC served as a perfect case study to assess the role of e-procurement adoption on procurement performance in state corporations in Kenya.

### **STATEMENT OF THE PROBLEM**

Studies reveal that state corporations spend upto 70% of their revenue/operational budget on public procurement (Rahim, 2008; Gebauer & Segev, 1998). In Kenya, government procurement amongst state corporations accounts for more than 11% of the GDP; thus revealing its significance in the economy (Kamotho, 2014). In spite of this, there is persistent public complaints among stakeholders over poor procurement performance in state corporations in Kenya which is characterized by long procurement lead-time; poor service delivery; non-compliance with procurement policy; inflated cost of acquiring goods and services (Malela, 2010; Miheso, 2013; Makau, 2014). As a state corporation; Kenya Utalii College has not been spared by the fore-mentioned problems. However, studies reveal that above challenges are not unique to Kenya; many state corporations amongst the developed nations have also witnessed the same; but organizations which adopted e-procurement managed to overcome them (Doherty, et al, 2013; Subramaniam & Shaw, 2002). Even though studies have been conducted on e-procurement adoption globally among state corporations, they have failed to explain the link between e-procurement adoption and procurement performance explicitly. However, researches have only succeeded in revealing major e-procurement procedures necessary in enhancing procurement performance. These include: e-tendering, e-award, e-ordering and e-invoicing. Faced with the problem of dismal procurement performance; the need for e-procurement adoption among state corporations in Kenya is inevitable. Studies indicate that e-procurement adoption is very slow; and that more than 50% of the public procurement processes are still being carried out manually in Kenya (Miheso, 2013; Makau, 2014). As one of the state corporations in Kenya faced with the fore-mentioned problems, KUC remains a classic place upon which this study is conducted. Thus, employing KUC as a case study; this research explores the role of e-procurement adoption in enhancing procurement performance in state corporations in Kenya.

## **GENERAL OBJECTIVE**

The overall aim of the study was to examine the role of e-procurement adoption on the procurement performance in state corporations in Kenya.

## **SPECIFIC OBJECTIVES**

1. To determine the role of e-tendering on procurement performance in state corporations in Kenya.
2. To assess the role of e-awarding on procurement performance in state corporations in Kenya.
3. To examine the role of e-ordering on procurement performance in state corporations in Kenya.
4. To establish the role of e-invoicing on procurement performance in state corporations in Kenya.

## **THEORETICAL REVIEW**

Oliveira & Martins (2010) explained that it is important to combine more than one theoretical model to achieve a better understanding of the e-procurement adoption phenomenon. As such, the researcher in this study is convinced that a mixture of various theories will adequately cover the concept of e-procurement adoption on procurement performance in state corporations.

### **Diffusion of Innovation (DOI) Theory**

Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. Rogers (2010) explains that DOI is a theory of how, why, and at what rate new ideas and technology spread through cultures, operating at the individual and firm level. DOI theory is basically based on two factors, the perception of the characteristics of the technology, and the user's perception of the system. Thus, main concern of this model is about how innovations are adopted as well as the reasons behind different rates of innovation adoption. Makau (2014) revealed that the rate of e-procurement adoption is very slow among the Kenyan state corporations. In order to identify the reason behind this, Rogers (2010) discovered the main elements influencing the spread of a new technology, which include: the innovation itself, communication channels, time, and a social system. These elements has direct impact on e-tendering adoption success among both buyers and bidders since it requires the following activities to be conducted: electronic advertisement of tender to the public, electronic transmission of bid documents to tenderers for filling in and electronic submissions of bid documents by tenderers. Since DOI is based on the perception of the characteristics of the technology and the user's perception of the system; it thus influences e-tendering adoption by both buyers and tenderers. As such, this model was employed in answering all research questions pertaining to the role of e-tendering on procurement performance in state corporations in Kenya.

### **Technology Acceptance Model (TAM)**

Davis (1986; 1989; 1993) developed and validated the technology acceptance model (TAM) to explain the mechanisms that influence and shape users' acceptance of new information technology. According to TAM, there are two specific variables that are fundamental determinants of users' attitude toward using information technology and actual use of the system: perceived usefulness and perceived ease of use relatively to new information system design features. Usefulness is defined as the degree to which someone believes that using a system will enhance his performance; and ease of use is defined as the degree to which user believes that benefits of systems' use are outweighed by the efforts for using it (Davis, 1993).

E-procurement adoption entails changes that includes reengineering the existing system within the organization that will ultimately impact on the way tasks are conducted (Kaliannan et al, 2008). Major procurement operations carried out within a state corporation that can be greatly changed as a result of e-procurement adoption include the ordering process which involves tasks like: order preparation, order approval and order transmission to the supplier. As such, the perception of employees and suppliers on the usefulness and ease of use of e-procurement system is very critical in realizing full benefits of e-procurement adoption; especially in the implementation of e-ordering. Thus, this model was employed in answering all research questions pertaining to the effect of e-ordering on procurement performance in state corporations in Kenya.

### **Transaction Cost Theory (TCT)**

This theory is anchored on the premise that the relationship between human and environmental factors is the reason why transaction costs increase in the economic system (hart, 2006).The interdependence of factors contributing to transaction costs can contribute to their increase or decrease. Thus, effort to reduce transaction costs should not aim at reducing the effect of a single factor but the effects of the interdependence between factors (Ghoshal, 2008).As such, in the procurement of goods and services for state corporations, transactional cost can be reduced by automating procurement processes. During tender evaluation and award stages in an open tendering in state corporations, financial evaluation is normally carried out to make a decision on the winning bidder. As such, the analysis of the amount quoted by various bidders in terms of cost and overheads is normally conducted in order to determine the actual price chargeable that can be negotiated. Since one of the major objectives of e-procurement adoption is to enhance cost reduction by eliminating transaction cost, TCT remains the best model to be used in answering all questions pertaining to e-awarding on procurement performance in state corporations in Kenya.

### **Technology-Organization Environment (TOE) Framework**

TOE framework was developed in 1990 (Tornatzky et al, 1990).This model has three areas that an organization uses to determine how to take advantage of the new technology relating

to e-business, which can influence the process of adopting, implementing and using technological innovations. These areas include: firstly; technological context. This refers to the existing as well as new technologies relevant to the firm. These include consideration factors such as: prior technology usage, and number of computers in the firm. Secondly, Organizational context; which refers to descriptive measures about the organization such as scope, organization structure, size, financial support, managerial beliefs and managerial structure (Chen,et al,2006).Thus an organization replaces a new innovation in its processes with a view of improving the effectiveness and efficiency of its performance (Mohamad & Ismail,2009). Finally; Environmental context which focuses on the external factors that drive firms to adopt new technology such as linking up with strategic suppliers, corporations branches, key customers of a corporation and tax collection government agencies ( Lippert & Govindarajulu,2015).

TOE model is relevant in this study since it can be used in developing strategies on how to link up with trading partners, departments and suppliers in the supply chain ecosystem .As such, this theory can be used to answer all research questions pertaining to e-invoicing whose success depends on proper linkages between the buying entity and the suppliers. Further, many existing studies touching on e-procurement (including Veit,2011) are anchored on TOE theory thus making it relevant in this research.

### **Institutional Theory**

Institutional theory emphasizes the importance of institutional environment in shaping organizational structure and actions. As such, Scott identifies three pillars of institutions, which include: regulatory, normative and cultural cognitive. The regulatory pillar emphasizes the use of rules, laws and sanctions as enforcement mechanism with a view of ensuring compliance. As the basis of compliance; normative pillar defines the norms and things that should be done; values (preferred or desirable) that should be adhered to; and social responsibilities. Finally, cultural-cognitive pillar rests on common beliefs, symbols and perceptions that together bolster shared understanding (Scott, 2005).

Studies reveal that state corporations are much more vulnerable to institutional forces than private sector corporations. As such, institutional theory has become a prominent lens through which organizational processes are interpreted and understood (Makau, 2014). This is more pronounced in public procurement especially during open tendering process; which requires government law and policy to be adhered to (Obanda, 2010). With the adoption of e-procurement by state corporations, it is imperative to have the state interest at heart when conducting e-procurement activities (in the open tendering process). These activities include: specification development, tender advert, bid transmission and response submission; tender opening, bid evaluation, contract award and agreement signing; order preparation, order approval, order transmission and acceptance (McConnell, 2009).Thus, this theory is preferred since it focuses on the deeper and more resilient aspects of social structure which is important in public

procurement. As such, this theory was relevant in this study since it reveals the importance of institutional environment and actions that are impacting on the role of e-procurement adoption on procurement performance among state corporations in Kenya.

## **CONCEPTUAL FRAMEWORK**

A conceptual framework explains either graphically or narrative from the main things to be included in the study in terms of key factors, concepts or variables and the relationship among them (Mathieson, 2001). The study focused on independent variables that include; e-tendering, e-award, e-ordering and e-invoicing; and how they relate to the dependent variable which is procurement performance in state corporations in Kenya.

### **E-Tendering**

E-Tendering refers to the process of sending requests for information and prices to suppliers and receiving the response using internet technology (McConnell, 2009; Henry, 2000; Neef, 2001 and Heywood et al., 2002). It is an e-procurement phase that involves the union of e-access and e-submission phases. This union comes a result of electronic advertisements of calls for tenders and contract notices at e-noticing phase. E-Informing or e-noticing is an e-procurement phase which entails gathering and distributing purchasing information both from and to internal and external parties using internet technology facilitated by on-line notification systems (McConnell,2009; and Heywood et al, 2002). This contributes to efficiency and effectiveness of the tender process in state corporations leading to enhanced procurement performance (Kamotho, 2014; Gunawardhana et al, 2012; McConnell, 2009; Croom & Brandon,2005).

Since the internet spans the globe, pockets of target market (for an item needed) scattered around the world can all be targeted at once, rather than trying to find different publications, radio stations and television stations that cater to a particular geographical area; thus e-informing has a greater range of coverage which attracts real competition leading to competitive prices of items to the buying entity (Gunawardhana et al., 2012). Besides, since tracking the reach of newspaper and television advertisement is difficult; e-notification allows the advertiser to track the number of impressions an ad gets from the people viewing it, and how many visits their business web site gets from particular ads. Since targeted nature of internet advertising and the ability to track the effectiveness of ads, conversion rates from e-notification is typically much better than traditional mediums, thus helps in reducing advertisement cost to the buying company (Doherty, et al, 2013).

Gunawardhana et al., (2012) revealed that there is a positive relationship between e-tendering and procurement performance. He explained that e-tendering enhances coordination of activities and communications between departments engaged in tender processing. The alerting system in e-tendering would remind users about critical issues and tasks that have been completed by different teams, minimizing human errors, as well as to route documents to appropriate parties or alerts individuals of actions in the system (Croom et al., 2006).

Studies reveal that e-tendering improves procurement performance in a number of aspects (Doherty et al., 2013; Croom & Brandon, 2005). These include: Increased efficiency which can be realized through faster response to questions and points of clarification during tender period; better access to procurement spending information and analytical reports; remote office operation is made possible as all authorized parties can access e-tender via a secured channel thus cross border tendering process can be achieved; shortening of tender analysis and procurement cycle thus allowing users to allocate resources and time for other critical issues (Hardy & Williams, 2011). Besides, data integrity is assured with e-tendering. This is due to the notion that better integrity of goods, services, works and vendor information as a provision of quality management of centralized repository; facilitates instant access to both current and historical tender information (Croom et al., 2006; Hsao & Teo, 2005).

E-tendering facilitates cost reduction in the tendering process in state corporations by ensuring less manual forms filling on tender preparation and data re-entry when upon receiving the tender; reduce hassles involved in communication and administration, achieving higher accuracy; reduce costs of participation for purchasers and vendors; reduce advertisement cost and cost to obtain detailed analysis of costs and markup (Doherty, et al, 2013; Croom & Brandon, 2005). Studies reveal that e-tendering can enable users to visualize the status on each tendering process by the comprehensive progress tracking function, reducing time for keeping track of status. Besides, streamlined workflow can be realized with faster tender and document submission; hence improved information distribution is achieved through e-tenders (Gunawardhana et al., 2012; Hsao & Teo, 2005).

### **E-Award**

E-Awarding is an e-procurement activity which entails secure tender opening, tender evaluation and tender award to the best offer (McConnell, 2009; Moon, 2005). This is activities are facilitated through e-awarding module. This module has a functionality that enables electronic evaluation of the received offers based on the awarding criteria and the evaluation formula defined by the procuring entity. The module also provides an environment that allows the implementation of electronic auctions, for all the dossiers where the awarding procedure of the market opportunity authorize it (Doherty, et al., 2013; Hsao & Teo, 2005).

E-awarding module is integrated with the e-notification module which allows the generation and publication of contract award notices; thus enhancing efficiency and effectiveness in the tender evaluation and award process. Moon (2005) explored the e-procurement management in state governments in U.S.A and revealed that there is a positive relationship between e-award and procurement performance. He explained that e-award allows downloading of electronically submitted tenders in a form suitable for evaluation purposes without having to manually re-enter data thus saves time; ensures consistent tendering practice across government since tender evaluation process and criteria is standardized; it promotes overall e-commerce initiative due to its environmentally friendly predominant 'paperless' process. Further, e-awards enhances

standardized electronic format which makes the comparison of bids more straightforward. Similarly, studies show that e-awarding process is transparent and open thus allowing public oversight; it facilitates improved coordination of tasks, consultation among bid evaluators who are geographically far during bid evaluation; and finally it enhances audit trails in the bid evaluation and award process (Doherty et al., 2013; McCornel et al., 2009; Moon, 2005). This means that data integrity is assured with e-award since centralized repository facilitates instant access to tender information (Hsao & Teo, 2005).

In order to realize full optimal efficiency in the tendering process in state corporations, e-awarding is tied together with e-contract activities. E-Contract involves agreement, acceptance and signing of contract between the contracting entity and the winning bidder electronically. It also facilitates monitoring of contracts through electronic means (Vaidya, et al, 2006; Hsao & Teo,2005).As such, studies reveal that e-award enhances procurement performance among state corporations by conducting the following: fostering integrity in the procurement process by ensuring vendor information does not leak out to third parties; improving audit trail in bid evaluation thus contributing to transparency in the tendering process; transmitting of contract award results to bidders thus allowing faster dissemination of information; signing of contract electronically which allows easy tracking of agreements thus improved compliance with the contractual terms; and speed in the evaluation process thus increased time saving (McCornel et al., 2009; Moon, 2005).

### **E-Ordering**

E-ordering is the use of Internet to facilitate operational purchasing process, including requisitioning, order processing, order approval, the transmission and acceptance of this by suppliers (Croom & Brandon, 2005).Early e-procurement technology solutions focused on this aspect of e-procurement as this was perceived as the area where maximum efficiencies could be achieved (Henry, 2000; Neef, 2001 and Heywood et al., 2002). The main advantage of using e-ordering is that if the supplier is able to receive the purchase order information electronically, they may be able to upload it directly into their order management system. This has the benefit of both avoiding re-keying data by sales operations staff, as well as minimizing any chance for errors in the order. Thus, by keeping the ordering information electronic from start to finish; the process is quicker, reduces errors and provides a clear governance and audit trail (Afande 2015; Doherty et al., 2013; Croom & Brandon, 2005).

Automated approvals are typically enabled through a transactional e-procurement or FMIS/ERP system, and are designed to translate the organisation's delegation and authority rules into an electronic hierarchy for use in approving orders (Akibate 2015; Orina, 2013). As such, an end user enters a requisition which is then automatically forwarded to their supervisor or delegate for approval. Once the requisition has been approved the requisition is sent to the purchasing department to turn it into a purchase order. The purchasing officer can approve or cancel requisitions at this stage. Some systems allow for automatic purchase order creation once a

requisition is approved by the supervisor. Once the order is created it is typically emailed or auto-faxed to the supplier (McConnell, 2009; Hsao & Teo, 2005).

Afande (2015) revealed that there is a positive relationship between e-ordering and procurement performance. He explained that automated approval systems enhances efficiency in procurement process due to its potential to conduct the following: reduce the amount of time from requisition submission to purchase order creation; reduce the cost of sending purchase orders to suppliers due to lower processing overheads; increases compliance with spend limits as long as the hierarchy is accurately maintained and checked during approval; controls leakage as end users have to go through additional steps to add suppliers not currently in the vendor master list. Thus e-ordering enhances procurement performance in corporations (Au, et al., 2014; Moon, 2005).

### **E-Invoicing**

E-Invoicing involves electronically receiving invoices from suppliers, processes the same and finally making electronic payment to suppliers via a Bank Automated Clearing System (BACs) (Doherty, et al., 2013; McConnell, 2009; Hsao & Teo, 2005). E-invoicing has the potential to greatly improve buyer-supplier relationships. Since both parties can monitor the processing of invoices at the touch of a button, it makes it easier to monitor what stage in the approval process an invoice has reached at any given time (Akibate, 2015; Orina, 2013; Moon, 2005). Besides, an electronic invoice is cheaper to create and administer than its paper predecessor, largely because the whole process is automated. Compared to paper invoices, e-invoices are easier to process, they reach the customer faster and can be stored centrally at very low cost (Hsao & Teo, 2005).

Doherty, et al. (2013) revealed that there is a positive relationship between e-invoicing and procurement performance. They explained that e-invoicing facilitates faster retrieval of money from customers by reducing the time an invoice or payment is in the post; enhances reduced printing and postage costs; enables quicker and cheaper processing as the information in electronic invoices can be fed directly into a company's payment and accounting systems and lower storage costs. These leads to efficiency and effectiveness in the procurement process leading to enhanced procurement performance.

An electronic payment system enables business to deliver, receive and process electronic invoice submissions for accounts payable and accounts receivable departments. Although most accounts payable departments have the capabilities to process electronic payments, studies reveal that two-thirds of invoices still arrive from vendors on paper. However, firms that go paperless by implementing an electronic payment system realize enormous process efficiencies and cost-savings benefits (Akibate, 2015; Kamotho, 2014; Moon, 2005; Hsiao & Teo, 2005). These include: firstly, processing cost reduction: a feature-rich electronic payment system lowers associate process time by automatically initiating and processing payments. Secondly, minimize overdue payments: a best-in-class electronic payment system accelerates credit and collections by giving customers, collections groups and internal customer service departments greater visibility into payment status. Thirdly, simplify dispute management: with an electronic payment

system, companies enjoy improved data accuracy and automated disbursement, receipt and payment processing to streamline vendor dispute management (Akibate, 2015; Gunawardhana et al., 2012; Kakwezi & Chinyere, 2007).

Fourthly, increased compliance: an electronic payment system makes it easier to track and monitor data to ensure adherence to complex compliance regulations and all business rules. Fifthly, enhanced security: an electronic payment system is highly secure, safeguarding cardholder data and preventing payment fraud better than paper-based payments can achieve (Kamotho, 2014). Sixthly, improved workflow efficiencies: increased automation is a key feature of a robust electronic payment system, enabling less reliance on time-consuming and costly manual business processes. Finally, greater visibility into financial supply chain: with access to reports and comprehensive corporate financial history, an electronic payment system gives management and other authorized users easy access to snapshots and detailed reports to improve decision-making and process efficiency. As such, e-payment greatly contributes to procurement performance (Kamotho, 2014; Doherty et al. 2013; McConnell, 2009; Moon, 2005).

### **Procurement Performance**

Procurement performance covers broader area of procurement, which include: internal users, the suppliers, qualification of procurement employees, purchasing function, market forces, government policy, and management decisions(Engström et al. 2009).Since objectives, targets and metrics are generally not established; procurement performance becomes very difficult to evaluate (Kakwezi & Nyeko, 2010).Studies reveal that it is difficult to realize value for money in the manual procurement system due to a myriad of reasons, including: slow transaction processing; increased handling errors; large volume of paper generated; difficulties in expediting deliveries; complicated procedures; excessive state intervention; bureaucratic processes; lack of centralized control; too many suppliers; lack of product standardization and lack of buyer influence (McConnell, 2009; Kakwezi & Nyeko, 2010).However, e-procurement solution came as a revolution to address the fore mentioned challenges in order to enhance procurement performance.

Among the state corporations globally that have already adopted e-procurement, the initiative has been heralded for the achievement of value for money because of its ability to actualize e-procurement promises identified by Hsiao & Teo (2005).These promises include: procurement cost reduction, enhanced customer service level, improved policy compliance and reduced procurement lead-time. As a result, procurement performance of such state corporations were greatly enhanced (Amayi & Ngugi, 2013; Doherty et al. 2013; Gunawardhana et al. 2012; Croom et al. 2006). A major breakthrough in e-procurement amongst public entities was the emergence of standard e-procurement procedures that replaced the manual procurement processes in the government open tendering; making them more efficient. A summary of these e-procurement procedures include: e-tendering, e-award, e-ordering and e-invoicing (McConnell, 2009). Regardless of shape and size of e-procurement systems in the market, it has been argued that the

basic procurement process is the same across the state corporations and can be addressed with straightforward technology to automate standard processes (Doherty et al., 2013; Vaidya et al., 2006).

E-procurement can reduce procurement cycle times by consolidating a broad range of spend categories; automate stock replenishment, requisition, and receiving, thereby reducing the time from low stock notice to full receipt at the third-party dock; provide an integrated way to receive, reconcile, approve invoices and make payment to the supplier electronically (Akibate, 2015; Hardy & Williams, 2011; Hsiao & Teo, 2005).

Studies reveal that e-procurement can only be justified only when the perceived benefit is large enough to cover the cost. As such; through competitive bidding and online negotiation, e-procurement provides an effective way to reduce material costs and transaction costs by finding the best quality products and services at the best price with discounts (Croom & Brandon, 2005). Besides, firms can more deliberately consolidate their supplier base to a preferred few, thereby reducing the legal costs of managing suppliers, significantly save on inventory, and minimize side-dealing (Hsiao & Teo, 2005). Similarly, with e-procurement, purchasing agents retain the flexibility for aggregation of spend with other institutions through consortiums for the purpose of acquiring greater discounts through volume purchases. This is essential to maximize the financial benefits of strategic sourcing (Akibate, 2015; McConnell, 2009).

Procurement processes and inventory management are ineffective if the people in the organization do not comply with the procedures established. As such, compliance to established protocol is necessary to realize maximum efficiency and savings and can be remedied through improved executive oversight matched with the appropriate technology solution (Kamotho, 2013; Croom & Brandon, 2005; Hsiao & Teo, 2005). E-Procurement technology ties the processes and the people together by simplifying the ordering and inventory management functions organization-wide thus facilitating compliance with established procurement policy (Au, et al, 2014; Kothari & Roehl, 2005). Further, compliance and maverick spending is a significant issue in many agencies, not because employees deliberately purchase outside of preferred arrangements, but rather through lack of awareness. E-procurement addresses the challenge of maverick spending through tools such as e-catalogs and standard electronic order processing and approval processes (Gunawardhana, et al., 2012; Croom, et al., 2006; Hsiao & Teo, 2005).

It is argued that every part of an agency contributes to external customer satisfaction by satisfying its own internal customers (Au, et al. 2014; Hardy & Williams, 2011; Slack et al. 2010; O'Riordan, et al. 2003). Thus, whatever the effects of e-procurement on the procurement department will inevitably affect other departments because they rely on procurement to bring in materials at the right time, price, quality, quantity and from the right source which are used to produce goods for the end customer (Okoye & Chinyere, 2007). As such, e-procurement

contributes to both internal and external customer service satisfaction (Hsiao & Teo, 2005; Croom, et al., 2006).

## **EMPIRICAL REVIEW**

Akibate (2015) explored the acceptance of e-procurement in Ghana. Findings of the study revealed that e-procurement strategies enhances procurement performance by reducing transaction costs and cycle times; allowing possibility of developing vendor managed inventory and improvements in just in time deliveries; facilitating more accurate deliveries due to reduced input order errors by suppliers; shared performance measurement data which encourages improved supplier performance; potential for less expediting by the buyer as the supplier acknowledges orders by exception which automatically updates the buyer's system; reduced stock due to shared sales/forecast information; possibility of using self-billing.

Afande (2015) investigated the adoption of e-procurement strategy and procurement performance in state corporations with reference to Kenya Revenue Authority. Findings of the study revealed that electronic order processing positively influenced procurement performance leading to annual savings; reduced procurement cycle-time and procure-to-pay cycle. The study was anchored on a combination of theories including: technology acceptance model, unified theory of acceptance and use of technology (UTAUT model), actor-network theory and transactional theory.

Makau (2014) explored the challenges facing adoption of electronic procurement in public sector in Kenya. Findings revealed that majority of agencies do not have the IT infrastructure to carry out e-procurement; government policies on technology does not fully support e procurement adoption; most employees perceive e-procurement as threat to their jobs; and lack of e-procurement knowledge.

Au, et al. (2014) explored e-procurement adoption employing six hotels as case study with an objective of identifying key factors that are associated with the low adoption of e-procurement specifically in the hotel industry in Hong Kong, a major tourism destination in Asia. The study revealed six major factors associated with the low adoption of e-procurement, namely: technical factors; perceived benefits; conflicts between hotel owners and management; resistance to change; product diversity; and rumors. They also found that companies majorly use e-procurement as a strategic tool for enhancing procurement performance.

Kamotho (2014) investigated the e-procurement and procurement performance among state corporations in Kenya. Findings of the study revealed that e-tendering and e-invoicing has greatly enhanced procurement performance. As a result, the following was realized: reduction of errors in order transmission, reductions in inventory, assured supply and reduction of production stoppages, reduced work content in the total 'requisition to payment' process, transaction cost reduction, reduction in the time taken to complete the procurement process, ensuring stronger

vendor-buyer relationship, improved procurement resource utilization, ensuring better contracts and delivery of best-value contracted goods and service.

Amayi & Ngugi (2013) explored the determinants of public procurement performance in Kenya using descriptive design approach. Findings revealed the following key determinants of procurement performance in Kenya: legal framework, procurement ethics, management support, and government policies.

Doherty, et al. (2013), scrutinized the Institutional responses to electronic procurement in the public sector in UK (among five public agencies as case studies). Findings revealed that despite being very different in form and function, every organization had already adopted bankers' automated clearing system (BACS). Besides, the following activities were being conducted electronically: invoice receiving, invoice processing, payment approval and payment transmission to suppliers to settle bills. The study found a positive relationship between e-invoicing and procurement performance; and further revealed that all five entities were actively planning to implement the following: e-tendering; e-award; e-contract and e-catalogue systems, but none had any intention of adopting e-marketplaces or e-auctions. The study was anchored on institutional theory and employed cross sectional research design.

Kiage (2013) investigated the factors affecting procurement performance in the public entities in Kenya. Findings revealed that there is poor contract management characterized by delays in payments of suppliers; poor planning and management of contracts is being experienced; projects takes long to complete; lack of procurement professionals; lengthy procedure of document processing; lack of proper mechanism for contract evaluation and monitoring.

Orina (2013) scrutinized e-procurement readiness factors in Kenya's public sector agencies with an objective of determining the extent of e-procurement levels in public institutions in Kenya. Findings of the study revealed that e-procurement in the public sector have been implemented, though not fully. The study also found that procurement performance of firms that have adopted e-procurement has been significantly enhanced. Further, it was revealed that Integrated Financial Management Information System (IFMIS) and SAP software are majorly the only ERPs used by public institutions to procure online.

Gunawardhana, et al. (2012) investigated the electronic procurement system in state corporations in Sri Lanka with a view of the concept of e-procurement as an instrument meant to modernize, simplify, and improve the existing manual procurement process. Findings found that there is a positive relationship between e-tendering and procurement performance. Further; findings revealed the following two stages of e-procurement implementation: Firstly, introduction and implementation of e-procurement system for selected limited number of activities (for instance, selecting limited activities like: publication of information for bids, registration of suppliers and provision of relevant information of the Ministry via the internet). Secondly, implementation of e-procurement system as a total solution to the manual procurement (for instance through:

registration of suppliers, e-tendering system, uploading the bidding documents, on- line request for bidding documents and on- line submission of offers).

Hardy and Williams (2011) explored the e-government with a focus on transdisciplinary view and interactive approach. Findings revealed that adopting e-procurement systems in a firm improves the performance of the procuring entity leading to efficiency and effectiveness in customer service delivery, resource utilization; and enhanced efficiency in production flow due to timely availability of raw materials.

Veit (2011) scrutinized the e-procurement adoption at the municipal level in Germany. Findings revealed that perceptions of risks and benefits are the strongest determinants of e-procurement adoption. Further, the study found the following benefits as a result of e-procurement adoption leading to procurement performance: enhanced customer service level, procurement policy and procurement cycle-time and investment cost reduction. The study was anchored on a combination of TAM, DOI and TOE theories.

Bertot, et al. (2010) explored the use of ICTs to create a culture of transparency in public agencies. Findings of the study revealed that the use of ICT in public procurement can enhance transparency in the procurement process by reducing the degree to which government officials withhold information from non-favored bidders and increase the possibility of public oversight.

McConnell (2009) explored the factors affecting the uptake of application of e-procurement within the UK public sector (with five case study organizations) anchoring his study on institutional theory. Findings revealed that; in order to enhance procurement performance yielding efficiency in resource utilization, reduction in procurement lead-time, policy compliance and enhanced service delivery among public entities; there is need for thorough understanding agency's procurement landscape; the impact (both negative and positive) of public policy on adoption; the impact of enhanced organizational standing and the need for clear vision and leadership from senior stakeholders; and finally, the need for a comprehensive definition of e-procurement to ensure that organizations pursue a holistic approach to its adoption (for instance e-sourcing, e-noticing, e-access, e-submission, e-tendering, e-awarding, e-contract, e-orders, e-invoicing, e-reverse auctioning, e-informing and e-market sites).

Kakwezi & Nyeko (2008) investigated procurement processes and performance with the aims of identifying financial and non-financial measures that can contribute to improved performance of the procurement function. Findings reveals that other than financial measures (which include: cost reduction and streamlined procurement processes leading to savings), non-financial measures (which include: reduced lead-time, enhanced procurement policy compliance and customer service level) also contribute significantly in enhancing procurement performance.

Okoye & Chinyere (2007) scrutinized e-procurement and revealed that whatever the effects of e-procurement on the procurement department will inevitably affect other departments because they rely on procurement to bring in materials at the right time, price, quality, quantity and from

the right source which are used to produce goods for the end customer. Thus they opined that e-procurement contributes immensely to both internal and external customer satisfaction.

Vaidya, et al. (2006) investigated the critical success factors (CSFs) that influence e-procurement implementation success in Australia. Findings revealed that CSFs are divided into three areas 'perspectives', namely: 1) procurement organization and management area, CSFs identified in this area include: top management support, user uptake and training, change management, project management and supplier adoption; 2) systems and technology area, CSFs identified in this area include: security and authentication, technological standards and system integration; 3) procurement practices and processes, CSFs identified in this area include: change management, re-engineering of the process, performance measurement and e-procurement implementation strategy. This study that was anchored on diffusion-based models of innovation adoption in relation to e-commerce/e-Business.

Croom, et al. (2006) scrutinized e-procurement and revealed that e-procurement facilitates order fulfillment by enabling information such as delivery times and quantities of products to be passed on quickly among relevant departments (like production and marketing) which helps them to plan and give quick responses and feedback to external customers thus contributes immensely to enhanced customer service level.

Moon (2005) studied the e-procurement management in state governments in U.S.A with a focus on diffusion of e-procurement practices and its determinants. Findings of the study revealed that many state governments have implemented e-procurement initiatives to improve their procurement performance and management. As such, e-award was found to have enhanced procurement performance and hence was quickly adopted. Further; the study revealed that relatively simple e-procurement tools have diffused widely and rapidly among state governments in the past years. This include: posting both the solicitation of bids and contract-award information on the Web; electronic ordering; automated procurement systems; and purchasing cards. On the other hand, technically complex tools requires more specific legal framework and as such, have been less widely adopted. This include: the use of legally binding digital signatures on procurement documents; Internet-based bidding; and reverse auctions. The study was anchored on diffusion perspective.

Hsiao & Teo (2005) explored the delivering of e-procurement promises with a view of establishing how to implement e-procurement effectively in Asia. Findings revealed the following e-procurement promises: procurement cost reduction, enhanced customer service level, procurement policy compliance and procurement reduced lead-time. Further, they identified a three-stage model for implementing e-procurement. These include: assessing e-procurement's match with firm's purchasing practices; determining operational and strategic objectives of the firm; and finally overcoming key barriers most likely to discourage buyers and suppliers.

Croom & Brandon (2005) investigated the key issues in e-procurement using exploratory study with an aim of analyzing the key lessons learned from e-procurement implementation across a range of UK public sector organization. The study found that e-tendering and e-ordering greatly improved procurement performance. The study explained that via the public web (internet); buyers have the opportunity to identify potential suppliers via standard search engines (such as google.com, yahoo.com). Besides, on-line search and comparison of list prices are typically used for specialist or low value purchases. Finally, orders may be placed on-line, via email or through the more traditional route of telephone, fax or mail. As a result, procurement performance was significantly enhanced thus yielding: consolidation of purchase specifications; reducing the number of suppliers; improved compliance with existing contracts; and overhead's savings. Further, the study revealed five exchange types employed within e-procurement transactions, namely: public web, exchange, marketplace, company hub and extranet.

Kothari & Roehl (2005) empirically examined the relationship between procurement policy compliance as independent variables and procurement performance as dependent variable in their study of e-procurement as an emerging tool for the hotel supply chain management. The findings of the study revealed a positive relationship between independent variables and dependent variables.

## **RESEARCH METHODOLOGY**

### **Research Design**

The research design constitutes the blue print for the collection, measurement and analysis of data, (Kothari, 2004). The study adopted descriptive research design. This design enables a researcher to obtain large amounts of data from a sizeable population in a highly effective, easy and in an economical way (Mugenda & Mugenda, 2003). The choice of this design is appropriate for this study since it utilizes questionnaire as a tool of data collection and helps to establish the behavior of employees towards adopting e-procurement in state corporations. Further, this research design provides facts and suggestions on major connections between the variables. This enabled the researcher to gain understanding on the role of e-procurement adoption on procurement performance in state corporations in Kenya.

### **Target Population**

Population refers to the larger group from which a sample is taken (Orodho, 2003). The study focuses on a population of 600 employees working at Kenya Utalii College. Target population refers to a specific group of individuals to which the researcher is interested in generalizing conclusions (Catillo, 2009). The study focuses on 120 employees as the target population working in the following levels: departmental heads, immediate supervisors and lower cadre employees. The choice of this group of respondents was appropriate in this study since they are directly involved in the implementation of e-procurement policy in the corporation. As such, a list that contains the number of all staff at various levels (job title

categories) was sourced from the human resource department and employed as sampling frame to identify every single element in the target population.

### **Sample and Sampling Technique**

A sample is a portion or a subject of the research population selected to participate in a study as a representative of the research population (Huber, 2008). It refers to a set of observations drawn from a population by a defined procedure. This study employed stratified sampling technique. This technique is used when a population from which a sample is drawn does not constitute a homogenous group (Kothari, 2012). The reason of adopting stratified sampling technique is that in this study, the strata in target population is heterogeneous; and whose response is vital in achieving the objectives of the study. In order to determine the sample size, the study employed Nasurima (2000) model. This formula is expressed as follows:

$$n = \{NC_V^2\} / \{C_V^2 + (N-1)\epsilon^2\}$$

Where:            n – is the sample size

                      N – is the target population (120)

$C_V$  – is the coefficient of variation (take 0.5)

$\epsilon$  – is the tolerance of desired level of confidence, at 95% level (take 0.05)

$$\begin{aligned} n &= \{NC_V^2\} / \{C_V^2 + (N-1)\epsilon^2\} \\ &= \{120 \times 0.5^2\} / \{0.5^2 + (120 - 1)0.05^2\} \\ &= 30 / 0.55 \\ &= 55 \text{ respondents} \end{aligned}$$

Thus, the study sample was 55 respondents.

### **Data Collection Procedures**

Data collection procedure is the process of gathering information from all the available sources using data collection instruments with the aim of using such data in research (Cooper, 2008). The questionnaires for the study were designed and distributed personally by the researcher to various respondents at their place of work. In order to guidance towards issues and topics under discussion in the questionnaire, the respondents were provided with interview guide through hand delivery by the researcher. After the end of the data collection period of two weeks, duly filled questionnaires were collected personally by the researcher for further processing and analysis of data.

## **Data Analysis and Presentation**

Data analysis is the process of resolving data into its components to disclose its characteristic elements and structure for accuracy (Mugenda, 2003). This study is expected to produce both quantitative and qualitative data to explain the role of e-procurement adoption on procurement performance exhaustively. Once the questionnaires were received, they were coded and edited for completeness and consistency. Data collected were analyzed using both quantitative and qualitative data analysis approaches. Data from closed and open-ended questions in the questionnaire were coded and entered into the computer using statistical package for social science (SPSS) version 23. This technique gives simple summaries about the sample data and present quantitative descriptions in a manageable form, (Orodho, 2003). The study employed ANOVA to test the level of significance of the variables on the dependent variable at 95% level of significance. The study also used correlation to establish the relationship between the variables. The purpose of doing correlation is to allow the study to make a prediction on how a variable deviates from the normal. Similarly, the study employed regression analysis; which is a quantitative research method used when the study involves modeling and analyzing several variables, where the relationship includes a dependent variable and one or more independent variables to provide meaningful and accurate conclusions of the phenomenon under study (David, 2005). Finally, descriptive analysis such as frequencies and percentages were used to present qualitative data in form of frequency distribution tables to enable easier understanding and interpretation using inferential statistics. Open ended questions were analyzed qualitatively, arranged thematically and presented on narrative form to draw conclusions and recommendations.

## **Multiple Regression Analysis Model**

Procurement performance in state corporations was regressed against four variables of the role of e-procurement adoption, which include: e-tendering, e-award, e-ordering and e-invoicing. The study employed regression analysis since it is able to relate dependent variable with multiple variables as shown in the equation below.

$$(y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon)$$

Where:-

y= Dependent variable (Procurement Performance)

$\beta_0$  = Constant (Co-efficient of intercept)

$X_1$ =Independent variable (E-tendering)

$X_2$ = Independent variable (E-award)

$X_3$ = Independent variable (E-ordering)

$X_4$ = Independent variable (E-invoicing)

$\beta_1 - \beta_4$  = Regression co-efficient for each independent variable

$\epsilon$  –Random or stochastic term

## **RESEARCH RESULTS**

The study sought to assess the role of e-procurement adoption on procurement performance in state corporations in Kenya. The first objective of the study was to determine the role of e-tendering on procurement performance in state corporations in Kenya. The findings indicate that other than electronic bid transmission to tenderers that has a mean of 2.00; state corporations strongly agree that the following roles of e-tendering increased their procurement performance: electronic bid-advertisement and electronic bid submission. This is reflected by a mean of less than 1.96. The findings coincide with Kamotho (2014); Gunawardhana, et al., (2012); McConnell, 2009); Croom & Brandon, 2005) who revealed that e-tendering enhances procurement performance of state corporations.

The second objective of the study was to assess the role of e-awarding on procurement performance in state corporations in Kenya. The findings reveal that other than electronic tender opening, electronic tender evaluation and electronic agreement signing that has a mean of 2.00 and above; state corporations strongly agree that the effect of e-award that increased their procurement performance include: electronic transmission of contract award results to bidders. This is indicated by a mean of less than 1.82. The findings correspond with McConnell, (2009); and Moon (2005) who found that e-award increases procurement performance of state corporations.

The third objective of the study was to examine the role of e-ordering on procurement performance in state corporations in Kenya. The findings indicate that other than electronic order transmission and electronic order acceptance that has a mean of 1.81 and above; state corporations strongly agree that the effect of e-ordering that increased their procurement performance include: electronic order preparation and electronic order approval. This is reflected by a mean of less than 1.73. The findings coincide with (Afande, 2015); McConnell, 2009); Moon, 2005); and Croom & Brandon, 2005) who revealed that e-ordering enhances procurement performance of state corporations.

The fourth objective of the study was to establish the role of e-invoicing on procurement performance in state corporations in Kenya. The findings reveal that other than receiving electronic invoice from the suppliers that has a mean of over 2.20; state corporations strongly agree that the effect of e-invoicing that increased their procurement performance include: electronic processing of invoices and electronic payment transmission to the supplier. This is indicated by a mean of less than 1.97. The findings coincide with (Kamotho, 2014); Doherty, et al., 2013); McConnell, 2009); and Moon, 2005) who found that e-invoicing enhances procurement performance of state corporations.

### **Correlation Analysis**

Multiple correlation measures the degree of association between two or more variables simultaneously. In this study the aim was to establish whether there is linear relation between

the dependent variable (Procurement Performance) and independent variables that is (E-Tendering, E-Award, E-Ordering and E-Invoicing), at 95% confidence interval and 5% level of significance. As stated above, if the significance value is less than 0.05 ( $p < 0.05$ ) then it is considered statistically significant. If the significance value is greater than 0.05 ( $p > 0.05$ ) the relationship is not statistically significant.

**Table 1: Correlation Matrix**

		Performance	E-Tendering	E-AWARD	E-Ordering	E-Invoicing
Performance	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	48				
E-Tendering	Pearson Correlation	.627*	1			
	Sig. (2-tailed)	.000				
	N	48	48			
E-Award	Pearson Correlation	.599*	.527*	1		
	Sig. (2-tailed)	.000	.000			
	N	48	48	48		
E-Ordering	Pearson Correlation	.636*	.350*	.469*	1	
	Sig. (2-tailed)	.000	.000	.000		
	N	48	48	48	48	
E-Invoicing	Pearson Correlation	.707*	.473*	.501*	.604*	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	48	48	48	48	48

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

Table 1 indicates the correlation between the independent variables (E-Tendering, E-Award, E-Ordering and E-Invoicing) and Procurement Performance at state corporations in Kenya. The findings revealed that there is strong positive relationship which is statistically significant between E-Tendering and Procurement Performance at state corporations in Kenya ( $r=0.627$ ,  $p=.000 < 0.05$ ).

There is strong positive relationship which is statistically significant between E-Award and Procurement Performance at state corporations in Kenya ( $r=0.599$ ,  $p=0.001 < 0.05$ ). There is strong positive relationship which is statistically significant between E-Ordering and Procurement Performance at state corporations in Kenya ( $r=0.636$ ,  $p=0.000 < 0.05$ ). There is strong positive relationship which statistically significant between E-Invoicing and Procurement Performance at state corporations in Kenya ( $r=0.707$ ,  $p=0.012 < 0.05$ ).

### Regression Analysis

The researcher conducted regression analysis to determine statistical significance between the independent variables (E-Tendering, E-Award, E-Ordering and E-Invoicing) and dependent variable (Procurement Performance).

**Table 2: Model Summary**

Model	R	R Square	Adjusted R Square
1	.738	.545	.503

R-square is the Coefficient of determination that explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable (Procurement Performance) that is explained by all the four independent variables (E-Tendering, E-Award, E-Ordering and E-Invoicing). From Table 2, the value of R-Square is 0.545. This implies that, 54.5% of variation of Procurement Performance was explained by E-Tendering, E-Award, E-Ordering and E-Invoicing. From the findings, there is remaining 45.5% which implies that there are factors not studied in this study that affects Procurement Performance.

**Table 3: ANOVA Analysis**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.643	4	1.411	12.886	.000 <sup>b</sup>
	Residual	4.708	43	.109		
	Total	10.351	47			

a. Dependent Variable: Performance

b. Predictors: (Constant), E-Invoicing, E-Tendering, E-Award, E- Ordering

The ANOVA test is used to determine whether the model is important in predicting the Procurement Performance. At 0.05 level of significance the ANOVA test indicated that in this model the independent variables namely; E-Tendering, E-Award, E-Ordering and E-Invoicing are important in predicting Procurement Performance as indicated by significance value=0.000 which is less than 0.05 level of significance ( $p=0.000 < 0.05$ ). Therefore there is significant relationship between the dependent variable (Procurement Performance) and the independent variables (E-Tendering, E-Award, E-Ordering and E-Invoicing).

**Table 4: Model Coefficients**

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Coefficients		
1	(Constant)	.580	.189		3.079	.004
	E-Tendering	.189	.093	.227	2.034	.048
	E-Award	.217	.102	.315	2.133	.038
	E-Ordering	.384	.133	.425	2.881	.006
	E-Invoicing	.457	.120	.521	3.821	.001

From the findings in Table 4 above, at 5% level of significance, E-tendering was a significant predictor of Procurement Performance of Kenya where ( $p=0.048<0.05$ ). E-Award was a significant predictor of Procurement Performance where ( $p=0.038<0.05$ ). E-Ordering was a significant predictor of Procurement Performance where ( $p=0.006<0.05$ ). E-Invoicing was a significant predictor of Procurement Performance where ( $p=0.001<0.05$ ).

Where, Y is the dependent variable (Procurement Performance),  $X_1$  is E-Tendering,  $X_2$  is E-Award and  $X_3$  is E-Ordering and  $X_4$  is E-Invoicing. As per the SPSS generated regression, Table 4.16 equation ( $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$ ) becomes:

$$Y=0.580+0.189X_1+0.217X_2+0.384X_3+0.457X_4$$

According to the equation taking all factors constant; the Procurement Performance was 0.580 state corporations in Kenya. A unit increase in E-Tendering would lead to a 0.189 increase in Procurement Performance state corporations in Kenya; a unit increase of E-Award would lead to 0.2167 increase in Procurement Performance at state corporations in Kenya; a unit increase in E-Ordering leads to 0.384 increase in Procurement Performance at state corporations in Kenya and a unit increase in E-Invoicing leads to 0.457 increase in Procurement Performance at state corporations in Kenya. Therefore according to the study findings E-Invoicing contributes more to the increase of Procurement Performance at state corporations in Kenya.

From the regression analysis, the value of R-Square is 0.545. This implies that, 54.5% of variation of Procurement Performance was explained by E-Tendering, E-Award, E-Ordering and E-Invoicing. From the findings, there is remaining 45.5% which implies that there are factors not studied in this study that affects Procurement Performance. The findings concur with McConnell, (2009) who further advocates the need for the following in e-procurement adoption among state corporations: thorough understanding of corporation's procurement landscape; the impact of public policy on adoption; the impact of enhanced organizational standing and the need for clear vision and leadership from senior stakeholders; the need for a comprehensive definition of e-procurement to ensure that organizations pursue a holistic approach to its adoption.

## **CONCLUSIONS**

From the above findings, the following conclusions were made. E-procurement has been adopted to varying extents by the state corporations. As such, it is clear that state corporations are still using the traditional procurement methods to a great extent. The study revealed that the greatest challenges faced by the respondents when using e-procurement include: lack of clear legal framework anchoring e-procurement; unsupportive government policy on public procurement; poor IT connectivity and networking; and finally, inability of most suppliers to adopt e-procurement system. The respondents also cited the following as the major traditional procurement problems which had been reduced by e-procurement adoption: reduced procurement cycle time and information exchange; ease and speed of processing payment and transmission of funds to the suppliers; and finally, enhanced lower administration overheads in

the procurement process. The major constraints experienced during the study include: uncooperative respondents and policy of the corporations on confidentiality; despite of these obstacles, the validity of the findings emanating from this study cannot be compromised.

## **RECOMMENDATIONS**

The fact that 45.5% of the procurement performance accounts for other factors (not covered in this study) impacting on procurement performance raises great concern. Similarly, findings revealed that e-procurement promises and efficiencies in state corporations in Kenya cannot be realized fully unless the following hindrances are addressed comprehensively: lack of information and competence on e-tendering, e-award, e-ordering and e-invoicing among bidders; limited internet access and system failure; poor IT connectivity and networking. In order to address these concerns, the study recommends that the government should come up with holistic system integration and technological standards that support e-procurement; and ensure adoption of the same, by all state corporations in Kenya. Besides, there is need for a comprehensive legal framework and government policy that makes it mandatory for all bidders dealing with state corporations to adopt e-procurement solution.

Further, since there is fear of system malpractices such as hacking of password and data bases when conducting procurement electronically; state corporations in Kenya still find it critical to stick to the traditional paper-based norms and activities, such as: signing and stamping of hardcopy invoices and delivery notes; processing and filing of hard copy tender documents. In order to weed out these practices, the study recommends that the government should re-engineer the existing procurement process and install a solid system security and authentication among state corporations; and finally develop a comprehensive e-procurement implementation strategy and ensure adoption of the same, by all state corporations in Kenya.

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