

**E-PROCUREMENT AND PROCUREMENT PERFORMANCE
AMONG STATE CORPORATIONS IN KENYA**

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DECLARATION

This is my original work and has not been presented to any other university for academic award.

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DEDICATION

This work is especially dedicated to my parents Mr. and Mrs. Samuel Waweru for your relentless support and encouragement in my studies and to all my family members for their inspiration and prayers. Your support brought me this far.

ABSTRACT

This study focussed on e-procurement practices and performance in state corporations and the study objectives were to establish the extent of e-procurement adoption among state corporations in Kenya, the challenges facing the adoption of e-procurement among state corporations in Kenya and the relationship between e-procurement and procurement performance among state corporations in Kenya. The target population of the study were all the state corporations in Kenya totaling two hundred and ten (210). A sample of 42 state corporations was taken out of this sampling frame. Data was collected through questionnaires. Analysis of the data was done using frequency and percentage tables to analyze the demographic information provided regarding the respondents and the organization, mean and standard deviation was used to analyze the various e-procurement practices adopted by the state corporations, data on challenges facing adoption of e-procurement was analyzed using means, standard deviation and factor analysis, whereas regression, means and standard deviation was used to analyze relationship between e-procurement and procurement performance among state corporations. The study found out that state corporations have adopted various e-procurement procurement practices to enhance their procurement performance. The regression analysis conducted revealed that the respective e-procurement practices adopted by state corporations have had a significant impact on their procurement performance. The study recommends that; the national government through line ministries should put an effort to bring the remnant state corporations to adopt e-procurement. The study reiterates the need for the relevant government organs to address the various challenges outlined in the study in order to make the goals of the e-procurement project feasible, and the need for more investments into research in critical success factors for successful adoption of e-procurement among state corporations in Kenya. The study was limited time constraints.

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LIST OF ABBREVIATIONS

GDP: Gross Domestic Product

ICT: Information and Communication Technology

IFMIS: Integrated Financial Management

KPIs: Key Performance Indicators

LDCs: Less Developed Countries

MDAs: Ministries Departments and Agencies

PE: Public Enterprise

PI: Performance Indicator

RFID: Radio Frequency Identification

SCM: Supply Chain Management

WAN: Wide Area Network

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CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

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).

Panetto and Boudjilida (2013) assert that, efficient enforcement of public procurement legislation is a considerably more important and difficult task than the formal adoption of public procurement guidelines. It thus appears that many countries have simply copied down directives and thereby formally fulfilled requirements while not possessing the needed capacity to implement them effectively, which has become quite evident problem in the recent past.

Till early 2000, Kenya like many of her counterparts in the developing world was marred by high inefficiency 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 (Susan and Hardy, 2005).

In Africa, the current phase in the development of public procurement has seen the establishment of special public procurement bodies, whose task is to implement the new regulations. These bodies aim not just to bring domestic legislation, but to play a key role in the efficient implementation of the regulations. These bodies have also been given increasing responsibility for monitoring of public procurement procedures. In this phase the regulatory frameworks have been completed by the adoption of all necessary secondary legislation, intensive training programs have been organized and needed manuals and instructions have been published aimed to inform widest range of procuring entities and potential bidders on how to implement the law provisions properly (Nicola, Missikoff and Fabrizio, 2011).

1.1.1 E-procurement

Croom and Brandon (2004) define e-Procurement as the use of internet based (integrated) information and communication technologies (ICTS) 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, 2006).

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, 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).

1.1.2 Procurement Performance

According to Van Weele (2006) purchasing performance is considered to be the result of two elements: purchasing effectiveness and purchasing efficiency. Performance provides the basis for an organization to assess how well it is progressing towards its predetermined objectives, identifies areas of strengths and weaknesses and decides on future initiatives with the goal of how to initiate performance improvements. This means that purchasing performance is not an end in itself but a means to effective and efficient control and monitoring of the purchasing function (Lardenoije, Van Raaij, & Van Weele, 2005). Purchasing efficiency and purchasing effectiveness represent different competencies and capabilities for the purchasing function.

CIPS Australia (2005) presents the differences between efficiency and effectiveness. Efficiency reflects that the organisation is “doing things right” whereas effectiveness relates to the organisation “doing the right thing”. This means an organisation can be effective and fail to be efficient, the challenge being to balance between the two. Measuring the performance of the purchasing function yields benefits to organisations such as cost reduction, enhanced profitability, assured supplies, quality improvements and competitive advantage as was noted by Batenburg and Versendaal (2006).

1.1.3 E-Procurement and Procurement Performance

To transform a procurement department into an e-procurement environment requires changes in buying behavior. It is a mistake to believe that the establishment of an e-procurement system can be comparable with the purchase of a new computer system. To succeed, significant planning must be done to find solutions that integrate strategy, technology, processes, and people. However, relatively little has been done with regards to empirical studies focusing on e-procurement implementation (Mitchell, 2000).

Implementation of e-procurement can impact organizations buying behavior (i.e., their buying process, selection criteria and the buying center). The buying process often is described as a

sequential process with separate stages, steps, or phases of buying activities that take place from the time that a need arises to the actual purchase and subsequent evaluation. E-procurement will change procurement processes leading to procurement efficiency in an organization. Kingori (2013) in her study on the impact of e-procurement at the Teachers Service commission found out that, there exists a strong relationship between e-Procurement, the levels of ICT expertise and the levels of e-Procurement application. This indicates that the procurement efficiency highly correlated with e-Procurement applications.

1.1.4 E-Procurement in State Corporations in Kenya

It is government policy to allow open competition for procurement without discrimination in a transparent, fair and accountable manner to ensure achievement of value for money in all procurement. Government also expects public procurement to contribute to the national economic growth and poverty reduction in line with the national development goals. Public procurement plays an important role in the Kenyan economy. The total volume of public procurement in 2003-2004 was established at 3.64 billion USD or 9% of the GDP (Independent procurement review Kenya May 2005). Government policy, among other things, seeks to achieve economic growth and poverty reduction and also show tangible improvements in the delivery of services to the people of Kenya. Public procurement in Kenya is largely done by state corporations under the guidance of the Public Procurement Oversight Authority in the confines of the 2005 Public Procurement and Disposal Act. In this context, state corporations are viewed as public entities like the central and county governments, courts, commissions, co-operatives, and educational institutions such as colleges, schools and universities that procure goods, services or works utilizing public funds (PPOA, 2009).

Public procurement is an important function of government (Thai, 2001). Instead of satisfying requirements for goods, works, systems, and services in a timely manner (Vaidya, Sajeev and Callender, 2006), the Kenya procurement system had proved to be long, cumbersome and time consuming. This procurement system had several deficiencies that contributed to huge losses in public funds (Mose, 2012). It has also proved to be costly for both buyer and supplier or organizations, besides being regarded as a perpetrator of corruption.

However, Wittig, 2003; Callender and Schapper, (2003) noted that a good procurement system has to meet the basic principles of good governance: transparency, accountability, and integrity. With these in mind, the government of Kenya decided to introduce e-procurement in state corporations which will ensure public financial resources are used prudently and for the intended purposes. This was due to complaints from Kenyans that the Government is being overcharged for goods and services that it purchases. By introducing transparency and accountability through e-procurement, it is expected to eliminate the abuse of our procurement system. Since procurement of goods and services constitute about 50 percent of the Government's annual budget, e-procurement will save substantial financial resources and help to instill confidence among taxpayers that they are getting value for their money. Emphasizing the benefits of e-procurement will strengthen the government-supplier relationship by providing easy access to information, documentation, simplify the bidding process and ensure cost saving for the Government and taxpayers. Through the automation of public financial processes, the Integrated Financial Management Information System (IFMIS) will provide an interlinked system of internal controls providing clear audit trails and identification of the originator of all transactions.

The roll-out of electronic procurement system through the IFMIS "Procure to Pay" module introduced a new era to Government procurement by bringing to an end manual procurement challenges that the country has experienced in the past. This will make Kenya a more attractive destination for investment. Kenya takes great pride in being the first African country to automate end-to-end procurement and payment processes in a devolved government system (Presidential Strategic Communications Unit PSCU, 2014).

A key milestone in the reformation of public procurement has been the amendment of the Procurement Regulations in 2006 that has enhanced the efficiency of procurement systems in state corporations in the recent past. The aggressive reforms being implemented by the Kenyan government can be attributed to the realization by the government of the need to continuously improve internal procurement policies and procedures. Government leaders must take a firm stance on changing longstanding culture and championing new and innovative ways to increase efficiency (Shalle and Irayo, 2013).

Public procurement managers require the execution of a focused and ongoing change management and improvement program to facilitate a positive change in behavior and culture that results in the creation of an efficient, collaborative procurement program. The benefits are administrative efficiencies, better contracts, stronger vendor relations, and the delivery of best-value contracted goods and services to internal and external customers. Part of the change in culture also requires a rethinking of a procurement officer's interactions with government programs and agency operations. The professionals of a central procurement organization should be embedded in, and accountable to, the programs that require their services (Plant and Valle, 2008).

1.2 Statement of the Problem

The overriding objective of a state's public procurement system is to deliver efficiency and "value for money" in the use of public funds, whilst adhering to requirements outlined in national laws and policies. Efficiency can be measured from the purchasing organization's context as to how well the purchasing department is performing in the activities they are expected to perform against the budget that is in place for that department. (Edwards and Graham, 2011).

A number of studies have been carried out on e-procurement and public procurement. Ruth (2012) in her study of information technology and procurement process in Kenya found out that, information technology if used appropriately can offer: smoother and faster process flow, efficient distribution of information, decentralization of tasks and decisions, increased transparency and better control in public procurement. Her findings however fall short of focusing on e-procurement as the main ICT tool that radically enhances procurement performance in the public sector which was the domain of the current study.

Meso (2010) carried out a study on Public e-procurement in Kenya: a critical analysis of the legal technological and governance challenges. According to her findings, e Procurement is slowly gathering momentum but the existing legal framework does not adequately support it. E-Procurement under the existing legal framework poses serious challenges ranging from insecurity, lack of confidentiality, and accessibility to the e Procurement systems etc. Her study though appreciating the challenges facing public procurement in Kenya, fails to offer possible

strategies of overcoming these barriers. The current study sought to fill this gap by investigating the potential of e-procurement in streamlining and mitigating the challenges facing the adoption of sound public procurement practices by establishing the relationship between e-procurement and public procurement performance in Kenya's state corporations.

Orina (2013) in her study on E-procurement readiness factors in Kenya's Public sector found that resistance to change, lack of enthusiasm, staff skills, and to some extent procurement policies impacted the readiness of e-procurement in public institutions. According to her findings, the main e-procurement readiness factors include: technology, organization's finance, leadership and integrity, legal framework and technical preparedness, international law and employee attitude, procurement policy and national procurement law, e-procurement adoption and staff I.T adequacy, and online marketplace and government support. Her study however fails to outline the impact of e-procurement in light of enhancing performance in public procurement an objective the current study aimed at achieving.

From the foregone discussion, it is clear that; despite the centrality of e-Procurement as a key strategy and supply chain management tool, there is inadequate literature from previous empirical studies relating e-Procurement and procurement performance particularly among the state corporations. While a number of past studies have unraveled the impact of e-Procurement most of them have not exhaustively investigated the role of e-procurement in enhancing procurement performance in state corporations. Against this backdrop the current study set to establish the role of e-Procurement in enhancing procurement performance among state corporations in Kenya.

The study sought to answer the following questions: What are the benefits of adopting and implementing e-procurement systems among state corporations in Kenya? What are the challenges facing the implementation of e-Procurement among state corporations in Kenya? What is the relationship between e-procurement and procurement performance among state corporations in Kenya?

1.3 Research Objectives

The objectives of the study were;

- i. To establish the extent of e-procurement adoption among state corporations in Kenya
- ii. To establish the challenges facing the adoption of e-procurement among state corporations in Kenya and
- iii. To determine the relationship between e-procurement and procurement performance among state corporations in Kenya

1.4 Importance of the Study

The findings of the study will be of importance to the following stakeholders:

Public policy: - The findings of the study will be of importance to policy makers and stakeholders in state corporations. By establishing the relationship between e-procurement and efficiency, the findings of the study will be a key ingredient in the; planning, designing and implementation of a sound public procurement system that will align itself to the overall economic strategy.

Future Researchers: - The findings of the study will fill a major literature gap thus providing backstopping for future researchers. The findings of the study will be of importance to both theory and practice. To practice, it will enhance policy making and stakeholders in the public sector. By establishing the relationship between e-Procurement adoption and procurement efficiency, the findings of the study will be a key ingredient in the; planning, designing and implementation of a sound e-procurement policy in the public procurement system in Kenya.

Donor agencies: - The findings will be beneficial to the donor community who are keen on tracking donor funds particularly in public procurement system of the recipient nations.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter reviews theoretical and empirical literature from past studies on the subject of ICT adoption among cooperative societies. The chapter focuses on the following issues: e-procurement; e-procurement and performance; challenges facing the adoption of e-procurement; the relationship between e-procurement and performance; chapter summary; and the conceptual framework of the study.

2.2 E-procurement

E-procurement can be viewed as a platform that links the government and suppliers in an online environment. E-procurement creates a framework in which government agencies as buyers procure goods/services by browsing catalogues advertised by suppliers hence a one-stop Portal for public sector procurement. The long term aim of the e-procurement initiative is to use Internet technologies to bring government agencies in the country and suppliers around the world together into a virtual trading environment (Zaharah, 2007). E-procurement is a multi-buyer, multi-supplier electronic procurement domain, which allows government agencies to function as independent buying entities under a single buying organization (Darin, 2007).

Organizational characteristics and organizational influences' are significant motivators to the use of e-procurement. Croom& Johnston (2003) argue that compliance by internal users is critical to the achievement of cost and efficiency gains from electronic procurement, and therefore internal customer satisfaction should be a key concern in the development, adoption and deployment of such systems. In other words, the level of compliance with e-procurement is strongly influenced by the general disposition of the organization as a whole to either electronic process redesign or the desire to gain perceived benefits from electronic procurement (Soeters, et al., 2014).

To build their core competencies, organizations are adopting e-procurement as a key strategy due to its capacity to reduce quality cost in which case, e-procurement ensures that selected suppliers deliver a product of service that does not exceed extensive quality control. E-Procurement can also reduce quality costs by making sure that the components bought do not load to complaints on the user department or final product to the customer. E-procurement contributes to product

design and innovation where innovation in industry comes from suppliers or is results from intensive interactions between suppliers and user department in any organization (Darin, 2007).

The need to adopt e-procurement cannot be underscored given the fact that public sector procurement is large and complex, accounting for between twenty and thirty percent of gross domestic product (Thai & Grimm, 2000) and traditionally attempts to meet many social and political objectives (Tether, 1977). Governments procure goods and, in order to preserve accountability and transparency services, use a complex contractual system designed to protect the public interest (Rasheed, 2004).

Through the public web, buyers have the opportunity to identify potential suppliers via standard search engines or specialist trading search engines. On line search and comparison of list prices are typically used for one of, specialist or low value purchases. Depending on the nature of the supplier's web site facility, orders may be placed online, via email or through the more traditional route of telephone, fax or mail. A marketplace is in essence a multi-supplier/multi-products catalogue often hosted and maintained by a third party and access provided to users via Internet or LAN connection (Soeters, et al., 2014).

2.3 Challenges Facing the Adoption of E- Procurement in Public Procurement

Despite the effort by governments to encourage public sector agencies to adopt e-Procurement, its implementation does not appear to have been smooth and the rate of e-Procurement implementation success has been less than spectacular, as supported by Steinberg's (2003) claim that "Government e-Procurement projects have been notoriously unsuccessful". The development and implementation of e-Procurement has not been as easy as some of the solution providers have suggested, nor has it necessarily brought the anticipated savings.

In Kenya and the rest of Sub-Saharan Africa, the implementation rate of public procurement systems has been slow and many government agencies tend to overstate the degree to which they are involved in e-Procurement (MacManus, 2002). Despite the benefits that can be achieved from a successful e-Procurement implementation in the public sector, the business press has reported a number of failures of e-Procurement initiatives in a number of public sector agencies in Kenya in the recent past including the Anglo-Leasing Scandal of the mid-2000. As observed

by Heywood (2002), e-Procurement will result in large investments of time and money, without absolute certainty that its full potential will be achieved every time (Boudijilda and Pannetto, 2013).

Critical success factors constitute the enabling factors in the adoption of e-procurement which include: end-user uptake and training; Supplier adoption; Compliance with Best Practice for Business Case/Project Management; System Integration; Security and Authentication; Security and Authentication; Performance Measurement; Top Management Support; Change Management Program; e-Procurement Implementation Strategy; and Communication Standards (Moszoro, 2014).

The high level of end-user uptake and training is positively associated with the organization and management implementation perspective of an e-Procurement initiative. As e-Procurement includes new technologies and changes in traditional procurement approaches, the need to train staff in procurement practices and the use of e-Procurement tools are critical to the success of an e-Procurement initiative. End-users can realize the immediate benefits of the e-Procurement system once they understand the operational functionalities (Hardy and Williams, 2011).

Senior management leadership is critical to the success of an e-Procurement implementation (AGV, 2003). In this regard, considerable attention and support need to be provided by senior management to ensure that the procurement reform has been well understood in the agency. Furthermore, the executive management team is responsible for setting the vision and goals, bringing about collective commitment for change in process and organizational structures, and formulating the policies and strategies necessary to put an e-Procurement initiative in place (Hardy and Williams, 2011).

E-Procurement implementation success is closely related to early supplier involvement. It is important to demonstrate the proposed solution to the suppliers and discuss any necessary changes, issues, and concerns such as various options in developing and maintaining supplier catalogues (Birks *et al.*, 2001). Providing opportunities for suppliers to offer their feedback will allow the public procurement department to monitor areas for improvement and adjust practices accordingly (Ringwald, et al., 2014).

The high degree of system integration is positively associated with the systems and technology implementation perspective of an e-Procurement initiative. It is very important to determine the level of integration required between the e-Procurement solution and existing information systems. If integration issues are complex, it is more likely that underlying business processes within an organization should be changed or adapted. It is also critical to link the e-Procurement system to the financial management system in order to facilitate the process of online payment to suppliers (KPMG, 2001).

Because of the sensitivity of the government data and the legal nature of orders and payments, security of data is critical in e-Procurement systems. The system must have mechanisms for identifying and authenticating the user who places an order so that the supplier knows it is safe to fulfill the order. In an e-Procurement environment, Birks *et al.* (2001) relates the security requirements at the e-tendering stage to authentication, arguing that e-Purchasing systems and processes need protection because they involve a financial transaction and may be vulnerable to fraud (Hardy and Williams, 2011).

Increasing change in underlying processes requires more learning and effort on the part of users. Consequently, more attention should be given to change management issues, citing three ways to achieve successful change management for e-Procurement: consultation, communication, and issue resolution. The World Bank Report cautions that while change management may be the least expensive aspect of an e-Procurement project, a lack of it can be a leading cause of project failure (World Bank, 2003).

The creation of documented and executable strategies prior to the deployment of the e-Procurement solution is an important critical success factor. As the procurement strategy is intended to provide savings enabled by the technology, e-Procurement should be procurement-driven as well as technology-driven. The e-Procurement strategy should be based on the introduction of sound procurement practices while taking into account the differences in requirements of the public and private sectors (Neef, 2001).

2.4 E-Procurement and Procurement Performance

In general, procurement performance is focused on compliance with requirements of internal and external audits rather than in the context of the overall effectiveness of procurement. Performance monitoring is limited, since objectives, targets and metrics are generally not established in most cases. This leads to a lack of focus on improving the performance of procurement activities (Qualls and Shaw, 2010).

Adopting an efficient public procurement system improves the performance of the procuring entity and at the national level: assists policy makers to understand how various policy goals interact and how policy impacts on the overall performance of the procurement system; enables governments and parliaments to improve the quality of decision-making and to take constructive and long-term actions that will most effectively develop their public procurement systems (*e.g.* in terms of procurement policy and regulatory reform, institutional development and capacity strengthening); create stronger incentives on governments to improve their public procurement systems, help them to set priorities for reform actions in the area of public procurement and to monitor progress against the objectives set; and provide valuable information for the assessment of the public expenditure system (Hardy and Williams, 2011).

The economic justification for e-Procurement is based primarily on the following three factors: Reducing off-contract spending by using technology to increase user awareness of existing contract facilities and by making it easier to order against them. Leveraging buying power by using technology to support the identification of opportunities for aggregation and by facilitating the aggregation of user requirements within and across organizations. And reducing transaction costs by using technology to automate processes which are currently paper based, and to streamline and standardize processes and documentation. The financial benefits which can be achieved through the implementation of the strategy recommendations are significant (Plant and Valle, 2008).

E-Procurement solutions are seen as a way to address many public sector procurement requirements. It has become apparent that the more the procurement process is supported by Internet technology, the easier it will become to develop and implement e-Procurement. The e-Procurement infrastructure and procedures can facilitate the achievement of the principles

including transparency and accountability requirements of the public offices while enhancing efficiency, effectiveness, and flexibility in the procurement process. E-Procurement has the potential to promote operating efficiency in public sector procurement and provide significant cost savings. One of key logical advantages of electronic transaction management is that it frees procurement staff for procurement evaluation and contract management roles. Furthermore, management information can be extracted from the e-Procurement system using standard reporting software. The transparent management information provided by e-Procurement also permits the monitoring of compliance with service level agreements and measurement of many other elements of supplier performance (Boudijilda and Pannetto, 2013).

The implementation of e-Procurement initiatives should be seen as an effort to improve the procurement goals, which normally include quality; timeliness; cost; minimizing business, financial and technical risks; maximizing competition; and maintaining integrity (Thai, 2001). In a similar vein; cost, quality, program management progress measures (on-time, on-budget, and issue management), process performance factors, and Return on Investment as the most relevant measurements. There remains, however, the challenge of controlling the range of variables required to reap the benefits of e-Procurement implementation. It should be remembered that because an e-Procurement initiative is expensive, demanding upon staff, and time consuming, it may take several years for public sector agencies to fully reap the strategic and operational benefits of e-Procurement (Hardy and Williams, 2011).

2.5 Summary of the Literature Review

E-Procurement should be viewed as an enabling mechanism to make the process of procurement more efficient in terms of cost, time, and achievement of value for money. Where existing procurement practices and procedures may contradict the goals and objectives of the new initiative, the implementation of e-Procurement requires the re-engineering of existing purchasing processes (KPMG, 2001). The roles and responsibilities might change substantially with the new process, which requires staff to adapt according to these (Birks *et al.* 2001)

According to the Stenning and Associates Report (2003), as a significant proportion of the benefits to be gained from implementing e-Procurement initiatives are related to the changes made through process re-engineering rather than the implementation of the e-Procurement

initiatives themselves, existing processes for dealing with procurement will need to be revised. Birks *et al.* (2001) suggest that the process of reengineering should not only address process but also supplier relationships and all the internal groups affected by procurement (Soeters, et al., 2014). The overriding objective of a state's public procurement system is to deliver efficiency and "value for money" in the use of public funds, whilst adhering to national laws and policies. Performance measurement is about seeking to answer the fundamental question of whether the procurement system and operations ultimately deliver in accordance with the main objectives set (Rasheed, 2004).

The impact of e-Procurement on procurement efficiency can be viewed in four dimensions: Cost efficiency benefits; the impact of e-Procurement on governance; e-Procurement implementation; and IT infrastructure issues. E-procurement leads to transactional and process efficiencies which ultimately lead to cost improvement. E-procurement allows for; greater opportunity for lower prices from suppliers; reduced work content in the total 'requisition to payment' process; and significant reductions in the time taken to complete the procurement process (Min & Galle, 1999; Croom, 2000; Emiliani, 2000; Zsidisin&Ellram, 2001; deBoer et al, 2002; Wyld, 2002).

Whilst it has been widely contended that e-Procurement implementation will have considerable implications for the design of the procurement process, it was observed by Lancioni et al., (2000) that the precise nature of these process changes remained unclear. Recently, Yen & Ng (2003) carried out a case study investigation of textile and apparel supply chain electronic commerce implementation in Hong Kong and although primarily interested in the e-commerce system roll-out processes, they provide a useful comparison of pre- and post- e-commerce procurement process performance. The above case study gives some useful description of the changes to the procurement process and supports the claims from prior literature that such changes deliver process efficiencies. In addition to the three categories of efficiency improvement mentioned above, they also highlight the reduction in costs arising as a result of 'digitizing' catalogues, reducing errors in order transmission, reductions in inventory, and reductions suppliers' marketing costs. Consequently, improved economies of management information are considered to be a major catalyst for reducing purchase prices (Moszoro, 2014).

2.6 Conceptual Frame work

The study examined how e-Procurement relates to the procurement performance of state corporations in Kenya. The independent variables included: e-Tendering; e-Catalogue/Purchasing; e-Invoicing; e-Auction/Reverse Auction; and e-sourcing and post-purchase review. On the other hand, the dependent variable was procurement performance of the state corporations. The relationship among the variable was estimated using the function:

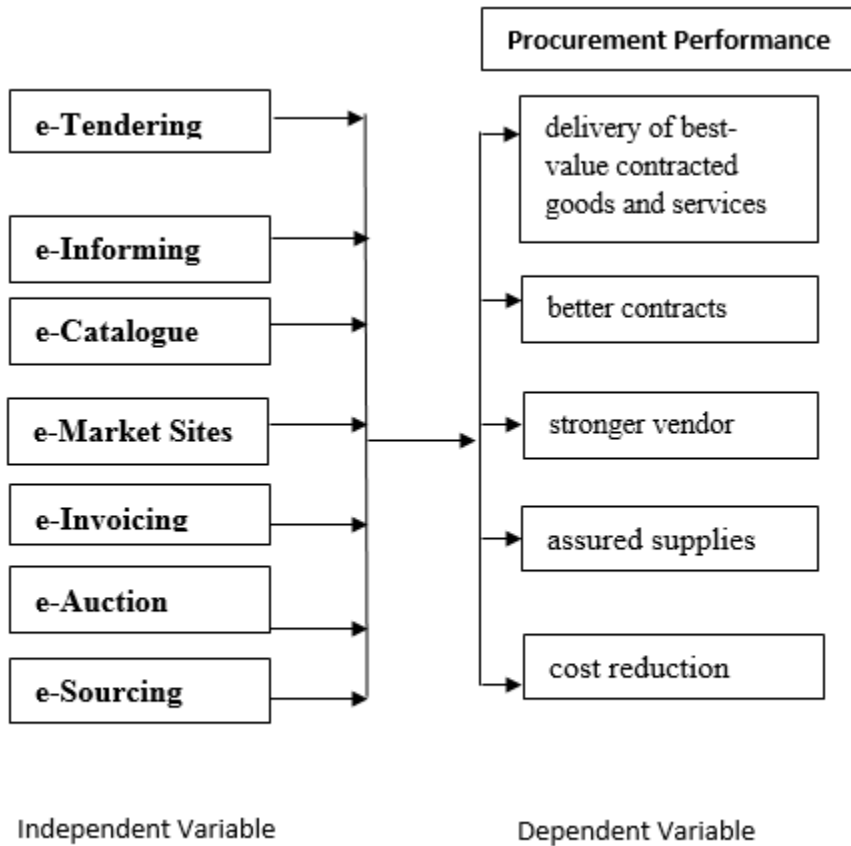
$$F_p = f(ePPs) \dots\dots\dots 1$$

Where;

F_p = Procurement Performance

ePPs = e-Procurement Practices

Figure 2.1: Conceptual frame work



Source: Researcher (2014)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter introduces the logical framework followed in the process of conducting the study. It is divided into: research design, population and sample, data collection, data analysis and the empirical model.

3.2 Research Design

The study adopted a descriptive survey design. A descriptive study is one in which information is collected without changing the environment (i.e. nothing is manipulated) thus it enables a researcher obtain large amounts of data from a sizable population in a highly effective, easy and in an economical way using questionnaires. Descriptive studies are also conducted to demonstrate associations or relationships between things in the world around you. In addition, a descriptive survey enables the researcher obtain quantitative data which he can analyse using descriptive and inferential statistics (Saunders et al., 2002).

3.3 Population

Mugenda and Mugenda (2003) defines a population as an aggregate of all that conform to a given characteristics. The population of interest in the current study included all the 210 state corporations in Kenya.

3.4 Sample

According to Mugenda and Mugenda (2003), a representative sample is one which is at least 10% of the population thus the choice of 20% was considered representative. A sample of 42 state corporations (constituting 20%) was taken for the study.

3.5 Data Collection

Primary data was utilized in the study. The respondents in the study included staff in the procurement departments. Primary data was collected using a semi-structured questionnaire subdivided into four parts. Part 1 consisted of open-ended questions aimed at obtaining demographic information on the corporation and the respondent, Part 2 consisted of questions aimed at obtaining data on extent of e-procurement adoption, Part 3 sought to establish challenges currently being faced in the adoption of e-Procurement whereas Part 4 focused on the relationship between e-Procurement and Procurement Performance among state corporations.

3.6 Data Analysis

For demographics once the complete questionnaires were collected, the data was coded accordingly thereafter frequency and percentage were applied to establish the frequency. For E-procurement Adoption, Challenges Facing the Adoption of E-procurement and Relationship Between E-procurement and Procurement Performance, the data collected was then analyzed using quantitative analysis. The data were assigned numerical values. The mean was calculated from the scores obtained from a Likert scale. Simple means; standard deviation, regression and correlation analysis of each factor indicating e-Procurement practices by the state corporations, challenges faced and the extent of adoption of e-Procurement on procurement performance were calculated. Factor analysis was applied to check on the categorization of the e-Procurement practices in the state corporations.

A multivariate regression model was used to analyze the relationship between e-Procurement adoption and procurement performance.

The multiple regression model was computed as follows;

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \epsilon \dots\dots\dots 2$$

- Where; Y = Procurement Performance
- β_0 =Constant
- $\beta_1, \beta_2, \beta_3, \beta_4$ = Coefficients of determination
- X₁ = e-Informing
- X₂ = e-Auction
- X₃ = e-Invoicing
- X₄ = e-Tendering
- X₅ = e-Catalogue
- ϵ = Error term

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSSIONS

4.1 Introduction

Data on e-Procurement practices adopted by state corporations in Kenya was analysed. The demographic data was examined using descriptive statistics and summarized in various frequency tables. With the help of SPSS statistical software, data on e-procurement practices adopted and their impact on the procurement performance of the respective state corporations was analysed using; mean scores, standard deviations, coefficients of variation and regression analysis. The factors were ranked in order of importance, the correlation between them yielded the key factors that loaded most on the components and therefore had the greatest impact on the procurement performance. Fourth two (42) questionnaires were administered to the selected state corporations. Thirty five (35) of these questionnaires were returned representing a response rate of 83.3 percent. The analysis, findings, and discussion are presented below.

4.2 Demographic Information

The demographic characteristics of the respondents that were tested include the sector under which the state corporations fall, the level of education of the respondents and whether the respective corporations have participated in e-procurement.

4.2.1 The Gender of the Respondents

Respondents were asked to indicate their gender, the results are as shown in Table 4.2.1 indicate that more than half of the respondents were male and a smaller percentage were female, implying most procurement positions are dominated by male.

Table 4.2.1: The Gender of the Respondents

Gender	Frequency	Percentage (%)
Male	20	57
Female	15	43
Total	35	100

4.2.2 The Age of the Respondents

Data was sought on the respective age groups of the staff in the procurement departments, the findings as put in Table 4.2.2 shows that the age group with the least respondents was 36-45 with only 15% of the respondents, followed by those aged 18-25 years representing 23%, second largest age group of the respondents were those aged 26-35 representing 28% of the respondents, whereas majority of the respondents were aged above 45 years representing 34% of the respondents. This suggests the likelihood that the respondents were vastly mature which can be associated with higher knowledge levels on procurement.

Table 4.2.2: The Age of the Respondents

Age (years)	Frequency	Percentage (%)
18-25	8	23
26-35	10	28
36-45	5	15
Above 45	12	34
Total	35	100

4.2.3 The Length of Service in the corporation

Respondents were asked to indicate the duration for which they had worked for the corporation. The results as indicated in Table 4.2.3 shows that 9 respondent had served for less than 2 years while 6 respondents had served for a duration between 3 and 5 years. It was also evident from the study that 5 respondents had served for a duration between 6 and 10 years while 15 respondents had served as for over 7 years in the corporation. This implies that majority of the respondents have served for long periods which translates to high experience consequently adequate knowledge on matters pertaining to process of procurement.

Table 4.2.3: Respondents Length of Service in the corporation

Length of Service (years)	Frequency	Percentage (%)
0-2	9	26
3-5	6	17
6-10	5	14
Above 10	15	43
Total	35	100

4.2.4 Literacy Level of the Respondents

One of the major challenges facing the implementation of e-procurement in public procurement is Low training levels coupled with low end-user uptake. In light of this the study sought to investigate the literacy level of the respondents yielding the results presented in Table 4.2.4.

Table 4.2.4: Literacy Level of the Respondents

Literacy Level	Frequency	Percentage (%)
High school or equivalent	7	20.0
Vocational/technical school	8	22.9
Bachelor's degree	13	37.1
Master's degree	3	8.6
Doctoral degree	1	2.9
Professional degree	2	5.7
Others	1	2.9
Total	35	100.0

Source: Author (2014)

According to Table 4.2.4, 37.1% of the respondents hold a bachelor's degree while only 8.6 of the respondents hold a master's degree. From the findings above its clear that low training levels is still a major obstacle in the public procurement reform owing to the fact that less than 50% of the respondents' have been trained beyond a bachelor's degree. The finding thus underscores the need for capacity building if the goals of the current clamor for procurement and financial reforms are to be achieved. The findings above support those of Hardy and Williams (2011) who found that high degree of re-engineering of the process is positively associated with the practices and processes implementation perspective of an e-Procurement initiative in their study of barriers to e-government projects in Sub-Saharan Africa.

4.2.5 Sector Under Which The State Corporations Fall

Different sectors contribute to the National gross domestic product proportionate to their economic potential. The study sought to determine the distribution of commercial state corporations across the different economic sectors in Kenya. The respondents were required to indicate the economic sector under which their corporations fall. The results are shown in Table 4.2.5.

Table 4.2.5: Spread of State corporations in Kenya

Sector	Frequency	Percentage
Agriculture	14	40.0
Financial sector	5	14.3
Building & construction	2	5.7
Education	4	11.4
Health sector	6	17.1
Telecommunication	3	8.6
Energy & Mining	1	2.9
Total	35	100.0

Source: Author (2014)

The findings in Table 4.2.5 show that most state corporations in Kenya fall in the agricultural sector with 34.2% while the least number of commercial state corporations fall under energy & mining sector. This is attributed to the fact that agriculture is the main economic activity in Kenya. This finding compliments those of Darin (2007) while investigating public procurement efficiency in developing economies.

A fully functioning e-procurement can improve governance by providing real-time financial information and manage resources. E-procurement coupled with the adoption of centralized treasury operations, can not only help developing country governments gain effective control over their finances, but also enhance transparency and accountability, reducing political discretion and acting as a deterrent to corruption and fraud (Chiang and Birtch, 2012).

4.2.6 Participation in E-Procurement

Successful adoption and implementation of a sound e-procurement policy depends on the extent to which the respective e-procurement strategies are adopted by key stakeholders in the public supply chain. The current public finance reforms spearheaded by the treasury under the umbrella of financial process reengineering calls for all state corporations to partake in e-procurement in tandem with the National Integrated Financial Management (IFMIS) policy.

The study sought to determine the number of state corporations that have participated in e-procurement in line with the current public procurement strategic policy. The results are shown in Table 4.2.6.

Table 4.2.6 Participation in E-Procurement

Participation level	Frequency	Percentage
The state corporation has not participated in e-procurement	24	68.6
State corporation has participated in e-procurement	11	31.4
Total	35	100.0

Source: Author (2014)

The results in Table 4.2.6 indicate that 68.6% of state corporations in Kenya participate in e-procurement. This is a clear indication that the government's effort to reform public procurement has started bearing fruit. However, the fact that 31.4% of state corporations have not participated in e-procurement implies that the country has a long way to go in ensuring that its public procurement reform model is fully adopted in tandem with the 2030 Vision. These findings concur with Spriano (2013) who carried out a study on the successes and failures of e-Government projects in Developing Countries: a case study of Zambia. According to him, the implementations of e-government projects and particularly e-procurement in Sub-Saharan Africa largely fail due to poor implementation strategies, poor communication and lack of adequate awareness among the key stakeholders.

4.3 E-Procurement Practices

The study sought to determine the various e-procurement approaches/ practices that have been undertaken by state corporations. Data was sought on the extent of adoption of the e-procurement practices by the state corporations. Respondents were asked to give responses on a Likert Scale of 1-5 where; 1 = very small extent; 2= small extent; 3= moderate extent; 4= large extent; and 5= very large extent. Analysis was done and results are as shown in Table 4.3.1.

Table 4.3.1: E-Procurement Practices

E-Procurement Practice	Mean	Std. Deviation	Analysis N
e-Invoicing- (delivery of bills and related information using electronic communications)	4.6562	0.48256	35
e-Catalogue- (list of goods or services on sale with their description and prices published as an electronic document)	4.8125	0.47093	35
e-Tendering- (sending requests for information and prices to suppliers and receiving the responses of suppliers using Internet technology)	4.8750	0.33601	35
e-Reverse Auction- (sellers bid for the prices at which they are willing to sell their goods and services)	4.8438	0.36890	35
e-Informing- (gathering and distributing purchasing information) both from and to internal and external parties using Internet technology)	4.5000	0.98740	35
e-Sourcing- (identifying new suppliers using Internet technology)	3.0312	0.17678	35
E-Market Sites- (use virtual marketplace based on the internet where numerous companies execute economic transactions)	4.8125	0.47093	35
e-Auction- (sell or bid for products or services via the Internet)	3.0312	0.69488	35

Source: Researcher (2014)

The findings in Table 4.3.1 indicate that all the state corporations have adopted e-procurement practices to a large extent given the fact that all the e-procurement practices have a mean of over 4.500 other than e-Auction with a mean of 3.0312. e-Tendering- (sending requests for information and prices to suppliers and receiving the responses of suppliers using Internet technology) has the highest mean of 4.8750 meaning that most corporations have adopted this practice to a large extent. e-Auction- (sell or bid for products or services via the Internet) is adopted to the lowest extent with a mean value of 3.0312. e-Informing- (gathering and distributing purchasing information) both from and to internal and external parties using Internet technology) has the highest standard deviation (0.98740) implying that e-auction has the greatest influence on the procurement performance of the state corporations. The findings above support the fact that E-Procurement solutions are seen as a way to address many public sector procurement requirements hence the reason why many state corporations are now responding to

the current public procurement reforms. The findings concur with Boudijilda and Pannetto (2013) who found that most state corporations' are fast adopting e – procurement to enhance their procurement performance in their study on the economic justification for e-procurement in developing countries.

4.4. Challenges Facing the Adoption of E- procurement

The study sought to investigate the various challenges that face the adoption and successful implementation of e-procurement among the state corporations. Respondents were required to indicate the extent to which the various challenges have hindered the adoption of e-procurement in their respective state corporations on a Likert scale of 1-5 where; 1 = very small extent; 2= small extent; 3= moderate extent; 4= large extent; and 5= very large extent.

Descriptive statistics were used to determine the variance of the e–Procurement practices as shown in Table 4.4.1.

Table 4.4.1 Challenges Facing the Adoption of E-Procurement - Descriptive Analysis

Challenge	Mean	Standard Deviation	Analysis N
Lack of top management support	3.2857	1.3189	35
Low End-user uptake	2.1143	1.1825	35
Low training levels	3.0286	1.3824	35
Poor System Integration	3.1429	1.3963	35
Lack of adequate Security and Authentication	2.6857	1.4906	35
Lack of Performance Measurement Systems	3.1714	1.2715	35
Lack of a sound Change Management Program	2.5429	1.3578	35
Poor e-Procurement Implementation Strategy	3.1429	1.3963	35
Poor Communication Mechanisms	2.3714	1.3303	35
Resistance to change by staff	2.6857	1.3671	35
High costs of implementing e-procurement	3.5143	1.4011	35
Non supporting organizational culture	2.8571	1.3750	35
Auditability risks	3.2286	1.5163	35

Source: Researcher (2014)

The findings in Table 4.4.1 indicate that all the state corporations face a number of challenges to moderate extent given that most challenges facing the adoption of e-procurement have a mean of 2.5. The High costs of implementing e-procurement are the biggest challenge with a mean of

3.5143 while Low End-user uptake is the smallest challenges with a mean value of smallest 2.1143. The challenge of Auditability risks has the greatest influence on the procurement performance with a standard deviation of 1.5163.

Factor analysis was applied where in the initial step; a correlation matrix was generated to identify any significant relation between the items. The number of factors corresponded to the number of respondents responses to the questions on the challenges facing the adoption of e-procurement. The principle component matrix is presented in Table 4.4.2.

Table 4.4.2: Challenges Facing E-Procurement Adoption – Component Matrix^a

Variable	Initial	Extraction
Lack of Top Management Support	1.00	0.888
Low End-User Uptake	1.00	0.732
Low Training Levels	1.00	0.797
Poor System Integration	1.00	0.859
Lack of Adequate Security and Authentication	1.00	0.763
Lack of Performance Measurement Systems	1.00	0.625
Lack of a Sound Change Management Program	1.00	0.723
Poor e-Procurement Implementation Strategy	1.00	0.810
Poor Communication Mechanisms	1.00	0.817
Resistance to Change by Staff	1.00	0.820
High Costs of Implementing E-Procurement	1.00	0.774
Non Supporting Organizational Culture	1.00	0.641
Auditability Risks	1.00	0.891

Extraction Method: Principal Component Analysis.
6 components extracted.

Source: Author (2014)

According to Table 4.4.2, the communalities were greatest for: Auditability risks (0.891); Lack of top management support (0.888); Poor System Integration; Resistance to change by staff (0.859); Poor Communication Mechanisms (0.820); Poor e-Procurement Implementation

Strategy (0.810); and Low training levels (0.797) thus, constituting the six major challenges facing e-procurement adoption among the state corporations.

Table 4.4.3: Challenges Facing E-Procurement Adoption – Total Variance

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.852	21.938	21.938	21.938	21.938	2.652	20.404	20.404
2	1.873	14.406	36.344	14.406	36.344	1.676	12.892	33.296
3	1.635	12.573	48.917	12.573	48.917	1.623	12.487	45.783
4	1.484	11.417	60.334	11.417	60.334	1.546	11.889	57.672
5	1.287	9.902	70.236	9.902	70.236	1.394	10.725	68.397
6	1.012	7.783	78.019	7.783	78.019	1.251	9.622	78.019
7	.850	6.537	84.556					
8	.558	4.296	88.852					
9	.449	3.453	92.305					
10	.383	2.943	95.248					
11	.229	1.765	97.013					
12	.217	1.669	98.682					
13	.171	1.318	100.000					

Extraction Method: Principal Component Analysis.
6 components extracted.

Source: Author (2014)

From Table 4.4.3 it is clear that six major challenges facing e-procurement account for 78.019% of the total variation in procurement performance where: Auditability risks accounts for (20.404); Lack of top management support (12.892); Poor System Integration; Resistance to change by staff (12.487); Poor Communication Mechanisms (11.889); Poor e-Procurement Implementation Strategy (10.725 and Low training levels (9.622). The findings above support Radford and Birks (2001) who found that, the two major obstacles to increasing support among users are their level of technological awareness and acceptance, and their willingness to change

long-established internal business processes. As the implementation process develops, periodic user satisfaction surveys may identify the possible need for additional training.

4.5 Procurement Performance of State Corporations

The study sought to investigate how e-Procurement adoption has contributed to the performance of state corporations. Several performance indicators were used to determine the procurement performance of an organization including, Transaction Cost Reduction, Improved Procurement Resource Utilization, Reductions in Inventory, Significant Reductions in the Time Taken to Complete the Procurement Process, Better Contracts, Delivery of Best-Value Contracted Goods and Service, Stronger Vendor-Buyer Relationship, Assured Supply, and Reduced Work Content in the Total ‘Requisition to Payment’ Process. Respondents were asked to indicate the extent to which the organization’s procurement performance was as a result of the adoption of the various e-procurement practices on a Likert Scale of 1-5 where; 1 = very small extent; 2= small extent; 3= moderate extent; 4= large extent; and 5= very large extent.

Means, Standard Deviation and Regression were applied in the analysis of the data as indicated on the following tables;

Table 4.5.1 Procurement Performance - Descriptive Analysis

Variable	Mean	Standard deviation	Analysis N
Reduction in errors of order transmission	2.6857	1.3454	35
Reduction in inventory	2.9429	1.2353	35
Assured supply	2.2286	1.2623	35
Reduced work content in total requisition process	3.1429	1.2161	35
Transaction cost reduction	2.3429	1.2589	35
Significant reduction in the time taken to complete the procurement process	2.4571	1.4419	35
Better contracts	3.1143	1.3884	35
Delivery of best value contracted goods and services	2.4000	1.3547	35
Stronger buyer-vendor relationship	3.1143	1.4095	35

Source: Author (2014)

The findings in Table 4.5.1 indicate that the procurement performance of state corporations has been enhanced at least to small extent with all the corporations having a mean of over 2.200. Reduced work content in total requisition process has the highest mean at 3.14 while assured

supply with a mean of 2.28 has the least mean. This implies that the procurement performance of the state corporations has been enhanced to a moderate extent through reduced work content in total procurement process. Stronger buyer-vendor relationship has the greatest impact on the variation in procurement performance with a standard deviation at 1.409 followed by better contract at 1.388.

An average performance of each performance indicator for all the state corporations was determined for analysis as indicated in Table 4.5.2.

Table 4.5.2: Average Procurement Performance Index

Average Procurement Performance Indices													
	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	N	APFI	
F1	10	26	59	84	48	34	21	34	23	60	396.9	35	11.340
F2	12	70	70	70	11	25	45	26	63	63	454.2	35	12.977
F3	31	24	52	32	66	33	67	68	55	26	454.21	35	12.977
F4	45	50	45	34	58	21	44	59	74	63	493.6	35	14.103
F5	10	70	54	46	50	84	28	74	78	30	522.2	35	14.920
F6	5.6	44	36	66	48	44	36	66	48	69	461.7	35	13.191
F7	44	63	37	41	75	10	26	59	84	11	449.4	35	12.840
F8	33	67	68	55	46	12	70	70	70	63	552.4	35	15.783
F9	21	44	59	74	44	21	34	23	60	51	430.6	35	12.303
F10	49	62	50	43	27	84	28	74	78	86	580	35	16.571
F11	22	34	21	34	45	10	70	54	46	41	375.5	35	10.729
F12	26	46	66	38	58	16	75	64	66	51	504.6	35	14.417
F13	63	74	51	57	32	44	36	66	48	37	507.8	35	14.509
F14	30	56	51	33	60	21	34	23	60	51	417.7	35	11.934
F15	74	37	41	45	34	63	51	84	34	63	524.1	35	14.974
F16	34	21	34	23	60	51	63	63	25	45	418.4	35	11.954
F17	25	45	26	63	63	11	37	21	35	28	354.4	35	10.126
F18	37	41	69	22	34	51	63	63	51	84	514.1	35	14.689
F19	69	84	28	74	78	25	45	26	54	37	519.5	35	14.843
F20	11	37	21	34	23	44	36	66	48	75	393.3	35	11.237
F21	63	51	84	34	51	16	75	64	66	51	553.4	35	15.811
F22	51	63	63	63	33	84	63	35	57	66	577.2	35	16.491
F23	86	37	41	51	23	63	51	51	64	51	518.1	35	14.803
F24	41	28	70	14	36	84	28	74	78	51	502.6	35	14.360
F25	51	84	20	51	20	25	45	26	63	63	447.2	35	12.777
F26	82	37	57	75	74	11	37	21	45	26	465.4	35	13.297
F27	16	75	64	66	51	10	26	59	84	26	475.6	35	13.589
F28	70	41	84	63	35	12	70	70	70	69	581.8	35	16.623
F29	10	74	63	51	51	63	63	63	33	51	522.32	35	14.923

F30	51	63	78	51	20	16	75	64	66	51	533.5	35	15.243
F31	14	63	84	41	74	21	34	23	60	16	428.5	35	12.243
F32	63	84	82	74	66	33	67	68	55	70	660.8	35	18.880
F33	34	21	34	66	84	21	44	59	74	10	446.22	35	12.749
F34	56	63	63	63	33	63	63	63	33	51	550.4	35	15.726
F35	56	74	84	51	65	16	75	64	66	51	601.1	35	17.174

Source: Researcher (2014)

4.6 The Link Between E-Procurement and Procurement Performance

To establish the relationship between e-procurement and procurement performance among state corporations a regression analysis was done using SPSS version 21 statistical package. The independent variables included: e-Informing- (gathering and distributing purchasing information) both from and to internal and external parties using Internet technology); e-Auction- (sell or bid for products or services via the Internet); e-Invoicing- (delivery of bills and related information using electronic communications); e-Catalogue- (list of goods or services on sale with their description and prices published as an electronic document) ; and e-Tendering- (sending requests for information and prices to suppliers and receiving the responses of suppliers using Internet technology. The dependent variable was procurement performance. The procurement performance indices for the state corporations indicated in Table 4.5.1 were used as the dependent variable in the regression analysis.

A multiple regression model was used in this analysis. The resulting regression coefficients have been used to interpret the direction and magnitude of the relationship. The β coefficients show the responsiveness of the dependent variable as a result of unit change in each of the independent variables (e-procurement practices). The error term ε captures the variations that cannot be explained by the model. Table 4.6.1 contains the summary of the regression model so established;

Table 4.6.1 Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				Sig. F Change	Durbin-Watson
					R Square Change	F Change	df1	df2		
1	0.964 ^a	.929	.916	0.0063403	0.929	1.242	5	26	0.001	2.628

Table 4.6.2 ANOVA^b

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	0.014	5	0.003	1.242	.001 ^a
Residual	0.001	26	0.000		
Total	0.015	31			

- a. Predictors: (Constant), **e-Informing-** (gathering and distributing purchasing information) both from and to internal and external parties using Internet technology); **e-Auction-** (sell or bid for products or services via the Internet); **e-Invoicing-** (delivery of bills and related information using electronic communications); **e-Catalogue-** (list of goods or services on sale with their description and prices published as an electronic document); and **e-Tendering-** (sending requests for information and prices to suppliers and receiving the responses of suppliers using Internet technology).
- b. Dependent Variable : Procurement Performance

Source : Author (2014)

From Table 4.6.1, the Coefficient of Multiple Determination (R^2) is 0.929 which implies that the model is of high ‘goodness of fit’. This means that the regression line explains 92.9% of the variation in the procurement performance of state corporations. Table 4.6.2 above shows the outcome of the Analysis of Variance (ANOVA) which indicates that, the F static was 1.242 with a significant change of 0.001%. This s implies that the impact of e –procurement practices on procurement performance is significant at 5% confidence level.

Table 4.6.3 E-Procurement – Model Coefficients^a

		Unstandardized Coefficients		Standardized Coefficients	t	sig
		B	Std. Error	Beta		
Constant		0.291	0.483		0.524	0.002
e-Informing- (gathering and distributing purchasing information) both from and to internal and external parties using Internet technology)	X1	0.405	0.057	0.254	2.729	0.000
e-Auction- (sell or bid for products or services via the Internet)	X2	0.181	0.046	-0.298	3.778	0.000
e-Invoicing- (delivery of bills and related information using electronic	X3	0.079	0.024	0.111	2.217	0.002

communications)						
e-Tendering- (sending requests for information and prices to suppliers and receiving the responses of suppliers using Internet technology.	X4	0.063	0.023	0.0085	2.182	0.000
e-Catalogue- (list of goods or services on sale with their description and prices published as an electronic document)	X5	0.077	0.066	1.1263	0.270	0.002

Source: Author (2014)

The results in Table 4.6.3 indicate all the e- procurement practices have a positive effect on procurement performance. The most influential e –procurement practice is the Corporation’s adoption of e –Informing with a regression coefficient of 0.405 and a P- value of 0.000. The Corporation’s adoption of e-Auction follows with a correlation coefficient of 0.181and a P-value of 0.000. Next is the Corporation’s adoption of e-Invoicing with a correlation coefficient of 0.079 and P-Value of 0.002; the corporation’s adoption of e-Catalogue with a correlation coefficient of 0.077 and P-value of 0.001. The corporation’s adoption of e-Tendering has the least impact on the procurement performance with a correlation coefficient of 0.063 and a P-value of 0.002.

From Table 4.6.1 the Coefficient of Multiple Determination (R^2 Square) is 0.929 indicating that the regression line explains 92.9% of the variation in the procurement performance of the state corporations.

As per the SPSS generated results shown in Table 4.6.1 the Equation $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \varepsilon$ becomes;

$$Y = 0.291+ 0.405X_1 + 0.181X_2 + 0.079X_3 + 0.063X_4+ 0.077X_5 + \varepsilon \dots\dots\dots 2$$

Where;

Y = Procurement performance

X_1 = e-Informing- (gathering and distributing purchasing information) both from and to internal and external parties using Internet technology)

X_2 = e-Auction- (sell or bid for products or services via the Internet)

X_3 = e-Invoicing- (delivery of bills and related information using electronic communications)

X_4 = e-Tendering- (sending requests for information and prices to suppliers and receiving the responses of suppliers using Internet technology.

X_5 = e-Catalogue- (list of goods or services on sale with their description and prices published as an electronic document)

ε = Random error

According to the regression equation (2) established above, taking all other independent variables at zero, the procurement performance of state corporations will be 0.291. The data findings analyzed also shows that holding all other independent variables constant, a unit increase in the corporation's adoption of e-Informing will lead to a 0.405 increase the procurement performance of the state corporation. Equally, keeping all other variables constant, a unit increase in the corporation's adoption of e-Auction will lead to an increase of 0.181 in the procurement performance of the state corporation. Taking all other independent variables constant, a unit increase in the corporation's adoption of e-Invoicing will lead to a 0.079 increase the procurement performance of the state corporation. On the other hand, taking all other independent variables constant, a unit increase in the corporation's adoption of e-Tendering will lead to a 0.063 increase in the procurement performance of the state corporation. Finally taking all other independent variables constant, a unit increase in the corporation's adoption of e-Cataloguing will lead to a 0.077 increase in the procurement performance of the state corporation.

The results above show that e - procurement management practices have had a significant impact on the procurement performance of state corporations in Kenya during the period under study.

This is supported by the high Coefficient of Multiple Determination of 0.929 and significance change of 0.001 (refer to Table 4.6.1: Model Summary).

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The data analysis, findings and discussions presented in the previous chapter were guided by the issues identified in the problem statement. A literature review identified the knowledge gap, the research design, and the subsequent analysis. A summary and concluding remark on the discourse, recommendations, limitations, and suggestions for further research are laid out in the synopsis below.

5.2 Summary of the Findings

The study sought to establish the relationship between e –procurement and procurement efficiency of state corporations. The first objective of the study was to establish the extent of e-procurement adoption among state corporations in Kenya. The findings indicate that all the state corporations have adopted e-procurement practices to a large extent given the fact that all the e-procurement practices have a mean of over 4.500 other than e-Auction with a mean of 3.0312.

The second objective of the study was to establish the challenges facing the adoption of e-procurement among state corporations in Kenya. Using Principal component analysis six major challenges facing e-procurement account for 78.019% of the total variation in procurement performance where identified including: Auditability risks accounting for (20.404); Lack of top management support (12.892); Poor System Integration; Resistance to change by staff (12.487); Poor Communication Mechanisms (11.889); Poor e-Procurement Implementation Strategy (10.725 and Low training levels (9.622).

The third objective of the study was to establish the relationship between e-procurement and procurement performance among state corporations in Kenya. The outcome of the regression analysis indicates that e - procurement management practices have had a significant impact on the procurement performance of state corporations in Kenya during the period under study. This is supported by the high Coefficient of Multiple Determination (R^2 Square) of 0.929 and significance change of 0.001 implying that the impact of e-procurement practices is significant at 5% confidence interval. The most influential e –procurement practice is the Corporation’s adoption of e –Informing with a regression coefficient of 0.405 and a P- value of 0.000 while the

corporation's adoption of e-Tendering has the least impact on the procurement performance with a correlation coefficient of 0.063 and a P-value of 0.002.

5.3 Conclusion

The high coefficient of Multiple Determination (R^2 Square) of 0.929 postulates that 92.9% of the procurement performance of the state corporations can be attributed to the e-procurement practices they have adopted hence the centrality of adopting and implementing e-procurement strategies in public procurement. To enhance their competitiveness and agility, state corporations have heeded the clarion call to adopt e-procurement practices in tandem with the current public procurement reforms while complementing the effort of the treasury in implementing Integrated Financial Management Systems (IFMIS).

The fact that each of the e-procurement practices have been adopted to a large extent is step in the right direction for the state corporations since it implies that corporations are not only more receptive and agile but also keen to enhance their competitiveness in the global economy now more than ever before. The challenges identified in the study on the other hand shed light on the critical success factors that need to be put in place to ensure that the e-procurement policy is successful at least in the medium-term.

5.4 Recommendations

The fact that 31.4% of the state corporations have not adopted e-procurement raises eyebrows particularly going by the current economic realities. The huge proportion of non-conforming state corporations underscores the need for the national government through line ministries to bring the remnant state corporations to the fold owing to the fact that public procurement through the state corporations accounts for over 11% of the GDP of the country.

In the same light the study identifies the barriers to successful adoption and implementation of e-procurement which reiterates the need for the relevant government organs to address the various challenges so outlined in the study in order to make the goals of the e-project feasible.

5.5 Limitations of the Study

The main objective of the study was to establish the relationship between the various e-procurement practices undertaken by state corporations in Kenya and their procurement performance. A study of this magnitude should include possibly a census a survey of all the state corporations. However time and material resources did not make this feasible and for this reason the study concentrated on just 42 of the state corporations. On the other hand, the study period was a little bit narrow for a study of this nature. Despite these challenges the validity of the findings emanating from this study cannot be compromised.

5.6 Suggestions for further Research

Studies involving confirmatory factor analysis will need to be carried out to further test the model so established and to confirm the findings of the study. Further studies can be conducted to test and confirm the factor loadings in different state corporations so as to establish the validity and strength of the model.

During the study, a number of challenges facing e-procurement adoption were identified. There is need for further research to focus on the critical success factors for successful adoption and implementation of e-procurement.

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APPENDIX – I: The Questionnaire

Part 1: General Information

- i. Gender: Male [] Female []
- ii. Age (years) 18-25 [] 26-35 [] 36-45 [] Above 45 []
- iii. Term of Service (in the corporation) (years) 0-2 [] 3-5 [] 6-10 [] Above 10 []
- iv. What is your job title.....
- v. What is the highest level of education you have completed?
- High school or equivalent []
- Vocational/technical school []
- Bachelor's degree []
- Master's degree []
- Doctoral degree []
- Professional degree []
- Other (please specify).....
- vi. Name of your Corporation/Ministry
- vii. Which sector does your organization fall (e.g. fishing, tourism, agriculture).....
- viii. Does your organization participate in e-procurement Yes [] No []

Part 2: E-procurement Adoption

Kindly indicate the extent to which your organization has adopted each of the following methods of e-procurement

Use the scale of: 1 – 5 where:

1 = No Extent; 2 = Small extent; 3 = Moderate Extent;

4 = Large Extent; 5 = Very Large Extent

No.	Issue	(1)	(2)	(3)	(4)	(5)
E- PROCUREMENT PRACTICES						
i.	e-Tendering- (sending requests for information and prices to suppliers and receiving the responses of suppliers using Internet technology)					
ii.	e-Catalogue- (list of goods or services on sale with their description and prices published as an electronic document)					
iii.	e-Invoicing- (delivery of bills and related information using electronic communications)					
iv.	e-Auction- (sell or bid for products or services via the Internet)					
v.	e-Sourcing- (identifying new suppliers using Internet technology)					
vi.	e-Reverse Auction- (sellers bid for the prices at which they are willing to sell their goods and services)					
vii.	e-Informing- (gathering and distributing purchasing information)both from and to internal and external parties using Internet technology)					
viii.	e-Market Sites- (use virtual marketplace based on the internet where numerous companies execute economic transactions)					

Part 3: Challenges facing the adoption of E-Procurement

To what extent has the organization faced each of the following challenges in the adoption of E-procurement

Please indicate on a Scale of 1 – 5 where:

1 = No Extent; 2 = Small extent; 3 = Moderate Extent;

4 = Large Extent; 5 = Very Large Extent

	C. CHALLENGES FACING THE IMPLEMENTATION OF E-PROCUREMENT	(1)	(2)	(3)	(4)	(5)
i.	Lack of top management support					
ii.	Low End-user uptake					
iii.	Low training levels					
iv.	Poor System Integration					
v.	Lack of adequate Security and Authentication					
vi.	Lack of Performance Measurement Systems					
vii.	Lack of a sound Change Management Program					
viii.	Poor e-Procurement Implementation Strategy					
ix.	Poor Communication Mechanisms					
x.	Resistance to change by staff					
xi.	High costs of implementing e-procurement					
xii.	Non supporting organizational culture					
xiii.	Auditability risks					
xiv.	Inadequate technological infrastructure to support e-procurement					
xv.	Lack of supplier interest/support					

xvi.	Systems integration issues					
xvii.	High implementation costs					

Any other challenge that may not have been captured above:

- i.
- ii.
- iii.

Part 4: Relationship between E-Procurement and Procurement Performance

To what extent has the organization performed as a result of adopting e-procurement

Please indicate for each procurement performance measure on a scale of 1-5 where:

1 = No Extent; 2 = Small extent; 3 = Moderate Extent;

4 = Large Extent; 5 = Very Large Extent

A. PROCUREMENT PERFORMANCE		(1)	(2)	(3)	(4)	(5)
i.	Reduction of errors in order transmission					
ii.	Reductions in inventory					
iii.	Assured supply					
iv.	Reduced work content in the total 'requisition to payment' process					
v.	Transaction Cost reduction					
vi.	Significant reductions in the time taken to complete the procurement process					
vii.	Improved procurement resource utilization					
viii.	Better contracts					
ix.	Delivery of best-value contracted goods and service					
x.	Stronger Vendor-Buyer Relationship					

Thank you very much for your valuable time.