E-PROCUREMENT IMPLEMENTATION AND PERFORMANCE OF PUBLIC UNIVERSITIES IN KENYA

BY

JOYCE SONGOK

A MANAGEMENT RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR MASTER OF BUSINESS ADMINSTRATION, SCHOOL OF BUSINESS, UNIVERSITY OF NAIROBI

DECEMBER, 2018

DECLARATION

I, the undersigned, declare that this is my original work and has not been presented to any institution or university other than the University of Nairobi for examination.

Signed: _____Date: _____

JOYCE SONGOK

This research proposal has been submitted for examination on approval as the University Supervisor

Signed: _____Date: _____

Mr. Michael Chirchir

Lecturer, Management Science

School of Business, University of Nairobi

DEDICATION

This task is devoted to my supervisor, Mr.Chirchir (Lecturer, Management Science), moderator, Mr. Nyamwange (lecturer, management science) for their continuous and tireless commitment to see me through this project. To my family for unfailing encouragement and love. To my dear father, Solomon and to my loving mother Leah, who were constant sources of encouragement for me to strive on to the accomplishment of this project? May Almighty God sanctify you indeed?

ACKNOWLEDGEMENT

My special thanks to The Almighty God for all he has done to give us an opportunity to come this far.

TABLE OF CONTENTS

ABBREVIATIONS AND ACCRONYMS

BSC	-	Balance scorecard
SC	-	Supply chain
SCM	-	Supply Chain Management

ABSTRACT

Public universities are key in the provision of quality education. The study was aimed at establishing the enactment of electronic-procurement management practices amongst public universities. The first objective was to inaugurate extent of implementation of e-procurement management practices in public universities. The next goal was on establishing the consequence of e-procurement management practices on SC performance while the third objective was on establishing the barriers of e-procurement management practices in public universities in Kenya. The study adopted use of strategic choice theory and the resource based view theory in its theoretical framework. The study adopted use of descriptive statistics in its research methodology where firsthand data which was gathered by use of questionnaires from a population which was made up of the 31 public universities in Kenya. The study findings for objective one from the descriptive statistics showed that to a moderate extent all the five e-procurement administration practices had been implemented in public universities. For objective two, multiple regressions were carried out on the four SCP measures which were quality, cost, timeliness and responsiveness. The results ascertained that implementation of e-procurement management practices had a large impact on cost and reliability at 60%, quality affected by 43% and flexibility 47%. Hence there is affirmative relationship amongst implementation of e-procurement management practices and supply chain performance. In addition, the independent variables were generally significant since the p-values were less than 5% in all the ANOVA tables. Besides the results of the third objective indicate that public universities to a moderate extent experience challenges like resistance to change by staff, high costs of implementation of e-procurement ,high costs of training staff , inadequate technological infrastructure and lack of performance measurement systems .The study major limitation was that it was based on public universities in Kenya .There is need for a further research on e-procurement management practices on supply chain performance in other sectors other than the public universities.

CHAPTER ONE: INTRODUCTION

1.1. Background of the Study

Dynamics in the external environment and pressures from the well versed economy on the role of education in the modern societies has compelled public universities to adopt efficient practices in their procurement practices. Public universities are under constant pressure to provide quality education and effectiveness in their operations, Meyer and Schwager (2007). Various pressures on public universities include pressure to provide quality education, provision of quality services, continuing downward pressure on price and globalization. Firms have been forced to adopt various strategies to make use of various opportunities in the external environment. Adoption of e-procurement has become an important strategic tool where organizations are leveraging on it in order to remain competitive, (Stock and Lambert, 2001). Globalization and technology shifts require organization to reengineer their operations if they are to maintain competitiveness (Walters, 2008). These dynamics of the market economy call for a shift in business focus to consumer responsiveness and innovative solutions that deliver value to the consumer profitably.

According to Walters, (2008) organizations have to collaborate and work hand in hand with the suppliers and customers to attain improved levels of performance through customer satisfaction. For such SC integration to occur, firms achieve that through use of ICT to enhance supply chain efficiency. Improvement in the ICT has been key in the attainment of timely delivery of quality goods through e-procurement (Musau, 2015). This study will investigate the effect of e-procurement to procurement in public

universities in Kenya. Public universities face many challenges of embezzlement of funds among others that result to lack of timely payment of their workers. Use of traditional procurement practices has led to loss of funds and delays in purchase of goods.

1.1.1 E-Procurement Implementation

Procurement is the process of identifying, analyzing and in the most optimal way finding the means of availing goods and services that are needed in an organization (Eadie, Perera, Heaney & Carlisle, 2007).The procurement process has four distinct stages or phases; information gathering or needs analysis phase, negotiation phase, settlement phase and the after sales phase (Eadie et al., 2007).With advancement in ICTs, internet powered by high communication technologies (e.g. 3G or 4G networks) has made online business transactions a preferred mode of doing business (Musau, 2015). E-procurement is the process of buying goods and services on an on-line platform, (Egbu, 2003).The usage of ICT in the acquisition process is what is signified as e-Procurement (Croom & Brandon-Jones, 2004).E-procurement is believed to bet the solution to the inefficiencies caused by use of traditional procurement methods which were time consuming and costly.

E-procurement is very important when it comes to improving procurement performance and by extension organizational performance, (Manrodt, Gibson, & Stephen, 2005). E-procurement involves use of software to manage and execute procurement functions. The software used in e-procurement integrates procurement functions and creates interfaces that enable fast and cost friendly execution of activities like tendering, catalogues generation and management, supplier contracting and management, and general

communication (Manrodt et al.,2005). The automation of processes speeds up transactions and enhances relationships through more contact between procuring entities and suppliers, provides evidence of transactions, and reduces paper work and related costs among other benefits, (Egbu, Vines & Tookey, 2003). Due to the numerous benefits of e-procurement, many organizations both private and public are opting for e-procurement systems.

1.1.2 Supply Chain Performance

SC performance is the organizations ability to lower cost of logistics by guaranteeing distribution of the correct products to accurate place at the right period, Zhang and Okoroafo, (2015). The extent to which supply chain's activities meet end customer needs is what is termed as SCP. Kwai et al (2004). SCP is measured using various performance metrics. According to Vogel (2011), SCP is highly influenced by macro factors namely SCM and corporate supply chain. It is on this basis that firms have shifted from individual organizational performance to procurement and SCP in order to enhance bottom line performance within the whole chain. SC performance measurement is also defined as the overall set of measures used to estimate both the competence and capability of the supply chain (Kurien & Qureshi, 2011).

According to Lee and Billington (2012), discrete sites in any Supply Chain fail to increase efficiency and effectiveness if they pursue goals independently. All Supply Chain members should understand the measurements and offer minimum chances for manipulation (Schroeder, Anderson & Cleveland, 2010). In this respect, performance models and studies should be formulated so that business goals and the achievement of

these goals can be measured. This will allow for the effectiveness of the techniques or strategies used to be easily accessed. All Supply Chain members should understand the measurements and offer minimum chances for manipulation (Schroeder, Anderson & Cleveland, 2010). In this respect, performance models and studies should be formulated so that business goals and the achievement of these goals can be measured. This will allow for the effectiveness of the techniques or strategies used to be easily accessed.

1.1.3 Public Universities in Kenya

The university education was started in the year 1961 where the Royal College Nairobi was transformed into a university which was facilitated through a special arrangement that was formed with the University of London that facilitated its ability to offer degrees through the University of London, (Kamau, 2012). The over alarming increase in demand for university education and the country's system of education and high increasing population, were the driving factors to the growth of universities in Kenya this has been since the mid-1980s. There are 31 public universities which provide quality education to the country's multitudes facilitated by high number of students.

1.2 Research Problem

With increased competition and globalization, to attain high competitiveness in the market, there is need for provision of which are to be offered at the lowest costs. To achieve high levels of customer satisfaction, there is need of adoption of e-procurement. This has a positive effect on organizations image, profitability and performance, Anderson and Mittal (2000).

The expectation of VAD for public universities' requirements is affected by changing needs of the customers and this is facilitated by use customer centric centers (Mohammad and Alhamadani, 2011). Since customers can switch from one service provider to the next at low cost, it means that it's elusive retaining unsatisfied customer. The procurement practices are easily broken and susceptible to consistent gaps (Jeppesen, 2010). Karanja and Kiare (2015) specifies exposures in the public campuses evinced in unpredictable flaking and re-hiring of personnel when confronted by down streams and up streams connection incoherence, distress administrative performance. Jibrin, Ejura and Augustine's (2014) distinguished foremost delinquent in contemporary purchasing business is not on inadequate guideline models but due to non-acquiescence and contemptible effecting process.

Many studies Globally, Soysal and Calipinar (2012), carried out a study on e-procurement practices in the wellbeing sector in Turkey. The study findings indicated that to a great extent various activities which involve flow of drugs from the doctors to the patients can be improved by use technology in their procurement processes. However, the study was sole based on the Health segment in Turkey. In addition, the study was grounded on Turkey and hence the study findings would not be applicable to the African context. The study was however based in Malaysian context and hence the findings would not be applied in the Kenyan context.

Mukherejee, (2013) carried out a study on e-procurement technologies agro-based SME's in Malaysia. The study findings established that the adoption e-procurement is affected by factors like cost, commitment. However, the study was based in Malaysia and

hence the findings would not be applicable in the Kenyan context. Quesada (2016) researched on the effect of e-procurement on purchasing practices and SCP. The study established that e-procurement had a constructive influence to procurement practices implementation and overall performance of the firm.

Locally Ndiiri (2015) in her study on e-procurement implementation and performance of county governments in Kenya ascertained that county governments have implemented e-procurement and this helps improve the SCP. The study aim was to ascertain the impact of e-procurement on SCP in county governments in Kenya and the extent to which the e-procurement implementation had been implemented in county governments. The study adopted use of descriptive statics where data was collected from all the 47 counties. The study however, suffered from methodological weakness based on the fact that it was solely based on the county governments.

Kamau (2013) carried out a study on e-procurements and supply chain management performance in government parastatals in Kenya. The study established that espousal of e-procurement implementation has a constructive impression on performance of parastatals in Kenya. Besides, the study established that suppliers do a significant character in the acceptance of e-procurement practices. Kagai (2013), in his study on electronic procurement in private universities in Kenya, established that there exists a positive correlation between adoption of e-procurement and SCP. The study also established to a great extent the private universities had adopted e-procurement practices.

Ngeera (2016) carried out a study on e-procurement implementation and performance of pharmaceutical firms in Nairobi. The results of the study established existence of a

constructive relationship amongst adoption of e-procurement practices and performance in pharmaceutical firms in Kenya. In addition the study established that to a large extent the various e-procurement practices had been adopted in various pharmaceutical firms in Kenya. However the study was solely based on pharmaceutical firms in Kenya and hence the findings could not be applicable to the public universities in Kenya. Okumu, (2017) in his study on the effect of adoption of electronic procurement and SCP in dairy firms in Kenya were aimed at ascertaining what impact the adoption of e-procurement has on SCP. The study findings indicated that there exists a constructive association amongst enactment of e-procurement practices and SCP of dairy firms in Kenya. The study established that to a large extent the various dairy firms had implemented e-procurement practices. However, the study was solely based on dairy firms in Kenya and it failed to tackle e-procurement implementation on performance of public universities in Kenya.

From the studies above both globally and locally, they indicate that there is no study has been carried out on e-procurement implementation on performance of public universities in Kenya. This study consequently pursued to response these research questions: What is the extent of implementation of e-procurement practices in public universities in Kenya? What is the effect of e-procurement practices on performance of public universities in Kenya? What are the barriers that public universities face in the implementation of e-procurement implementation in public universities in Kenya?

1.3 Research Objectives

I. To establish the extent of implementation of E-procurement on performance of Public Universities in Kenya.

II. To establish the effect of implementation of e-Procurement on performance of Public Universities in Kenya

III. To determine the barriers faced in the implementation of e-procurement management of public universities in Kenya

1.4 Value of the Study

Various stakeholders in the public universities will benefit from this study. Public universities will benefit from this study on the role e-procurement implementation plays in the SCP of public universities in Kenya. Other universities will also benefit from this study based on the fact that they will be able to benefit from the study findings in their future plans to adopt e-procurement management implementation. The supply chain managers in these universities will understand the benefits of adopting e-procurement implementation. By understanding what impact that adoption of e-procurement Implementation has on performance, this will help management in the planning for future. This will in the long run facilitate their competitiveness in the market. This will increase the customer service levels and cut on operational costs.

Future studies will be made with the use of this study as the reference material. Academicians and other scholars will also benefit from this study since they will use it a reference for future studies in the e-procurement and SC performance.

CHAPTER TWO: LITERATURE REVIEW

2.1Introduction

This section encompasses theoretical framework, the e-procurement implementation, Literature assessment and conceptual framework which form the basis of the topic of study.

2.2 Theoretical Framework

Various theories that make up a basis of this research are what form the theoretical framework. It is made of not only principles, theories but also the various findings that were obtained. This study will be guided by: resource dependency theory and strategic choice theory.

2.2.1 Strategic Choice Theory

It expounds on affiliation amongst a firm's actions and events (De Rond & Thietart , 2007). This theory expounds on the associations amongst administration choices and performance and the inclusive collaboration with environments. According to this theory firms are impressed by environs and decisions made by upper management (Miles, 1978). The conclusion to or not adopt a certain practice and the resulting impact on performance is made by the top management. Produce or outsource should balance on necessity alongside worth to meet the goals of the organization. In respect to acceptance of e-procurement implementation decision, it advices on the minimization of environmental effect and overall costs incurred (Nollet, 2005).

In this study, public universities firms have to come up strategies to adopt e-procurement implementation that will facilitate their improvement in the levels of procurement

performance. The top management together with the supply chain managers has to device strategies like adoption of e-procurement implementation that will facilitate their improved performance. Adoption of e-procurement implementation in public universities is affected by decision made by the government in form of regulations.

2.2.2 The Resource Based View of the Firm

The Resource Based View (RBV) asserts that competitive advantage can be created in a firm based on the method in which resources are applied within a firm (Barney, 2006).Based to this theory; organizations are able to sustain their competitive advantage by based on contributions of human capital management practices. This is through creation of specialized skills in the firm that are not easy to imitate (Afiouni, 2007). This theory further asserts that creation and maintenance of competitive advantage is by creating diversity in resources and making them immobile For a firm to be competitive, then it needs to have enough capital and resources, (Afiouni, 2007; Barney, 2006; Schafer, 2004). Ccompetitive advantage of a firm can be created if resources and capabilities of a firm are mixed and deployed in a proper way. This facilitates creation of human capital resource diversity and immobility (Barney and Hesterly, 2006).

The resource based view theory is related to this topic of study since adoption of e-procurement is seen as a strategy by firms to attain competitive advantage in the firms based on its ability to provide goods and services timely to cost efficiencies, timeliness and effectiveness created by adoption of e-procurement implementation.

2.3 E-procurement implementation

There are various e-procurement implementations adopted by firms in their quest to be effective and meet firm's goals. However the main e-procurement elements looked at in this study are e-tendering, e-sourcing, e-requisitioning, e-approval and e-invoicing. These are discussed below:

E-tendering entails the process that are involved in sending requests from information from the prospective suppliers on prices charged for various products that they intent to source and the receipt of these information by the suppliers by use of technology Guwnawardhana (2012). It entails use of internet to send requirements for specifications and prices to and receive responses to and from suppliers. According to Shalle (2014), E-tendering substitute's manual paper-based tender processes to save time and money. The process of carrying out entire online cycle of price bid submission facilitates efficiency, economy, and the speed of carrying out transactions. Nexender (2013) assets, with e-tendering, buyers can copy and paste data from the electronic tender documents to easily compare and manage the tenders. Evaluation tools can give computerization of the similarity procedure. E-tendering shortens process cycle extensively hence reducing costs of invitations to tender (ITT) response by supplier's

E-Sourcing entails identifying new suppliers for a detailed type of purchasing necessities using internet. Business organizations are shifting procurement practice online so as to attain a huge figure of suppliers than would be feasible using traditional ways. Shalle (2014) refer to e-sourcing as a key advantage of viable part by which projects are bided for by suppliers. Bids are submitted by suppliers alongside particulars of the service offered to be provided then purchasers can pick and select from the offers. They are tools

that are used to manage the flow of different types of documents by either automating the document creation process or electronically transmitting to the suppliers,(Monczka, 2015).Use of e-sourcing system is an online trading and processing platform that supports electronic acquisition of products and services, (Sitar, 2011).

E-requisitioning entails use of internet tools in the process of requesting for goods and services by firms in the firm factoring in other considerations used in supplier selection. By use of e-requisitioning, one is able to source the necessary goods or services, evaluate offers offered by the various suppliers and select the best from which the process concludes with preparing a purchase order which is then sent to the selected supplier. Use of e-requisitioning facilitates improved performance of a firm's procurement process based on a study carried out by Kimutai (2017).

According to Ingram (2016), electronic order processing systems capture order data from customers directly or from customer service employees, keeps the data in the central database and passes order details to the shipping and accounting division. Data on orders and inventory is tracked through order processing systems every step of the procurement step. There is an assurance of customer order timely fill as errors in order processing reduce since systems automated.

E-Invoicing entails electronically receiving invoices from suppliers and finally making electronic payments to various suppliers the same day and finally making electronic payments to the various suppliers through use of Bank Automated Clearing System (Doherty, 2013) .Adoption of e-invoicing has a positive impact on performance .Through adoption of e-invoicing facilitates the firm's ability to retrieve funds from customers

based on the fact that they help reduce time taken by an invoice in the post and reduced processing time of information, since it can be fed into the system .By this it results in the effectiveness and efficiency of procurement processes. Its use helps facilitate the firm's ability to monitor the stage at which the invoice has reached (Scholes, 2006).

2.4 E-procurement Implementation and Supply Chain Performance

The e-Procurement processes and structure aids the realization of the following; effectiveness, accountability and transparency, improving efficiency, and elasticity in process of procurement. E-Procurement offers considerable cost savings and promotes operational efficiency in public sector procurement. Freedom of procurement staff from evaluation and contract management roles is a key reasonable benefit of electronic transaction management (Boudijilda & Pannetto, 2013).

E-Procurement economic benefits primarily are rooted on; lowering spending outside contract by use of technology to raise user consciousness of accessible products and services therefore easing to order. It reduces transaction costs by automating procedures presently paper-based, and to simplify and regulate processes and records. Implementation of e- procurement significantly enhances achievement of financial benefits (Plant & Valle, 2008).

2.5 Barriers to E-procurement Implementation

Top management support and employee knowledge are main challenges of e-procurement implementation and use. According to Grover (1993), Lack of top management support may as well mean resistance and may result in failure of implementation (Grandon & Pearson, 2004). Studies such as Mose, Njihia and Magutu

(2013) established that major challenges facing adoption of e-procurement include; employees' resisting change, company board not approving e-procurement practices and management not supporting the e-procurement practices.There is increased risk of buyer's perception due to lack of previous experience or relationship with internet based supplier.

According to (Adero, 2014), adoption of e-procurement is poor telecommunication infrastructure, readiness of customers and vendors, government policies, high costs of internet usage and training of employees. According to Halihah, (2010), limited commitment and ownership to support and push e-procurement implementation is a main encounter to the adoption and enactment of e-procurement in firms. Galle (2003) asserts that opinions about the costs, risks and benefits of e-procurement systems notably influence its implementation and use. The concept that e-commerce is valuable to businesses is discarded by several managers (Drew, 2003). Walczuch et al., (2000) on the other hand suggested those managers' and opinions that the Internet would not drive to extra competence or lessen costs are the main hurdles to implementation and use.

Kalakota et al., (2006) suggested application of e-procurement involves good and supportive soft with hard technological system in the organization for effective application. IT systems include; computers, databases and communication networks, an interrupted power supply, e-procurement software, adequate servers and backups (Kalakota et al., 2006).

2.6 Empirical Literature Review

This section contains literature review of studies done both locally and globally on e-procurement. Globally, Parker (2008) carried out a study on using E-Procurement and Supply Chain Integration in the US-based Firms. The study was aimed at establishing the impact that supply chain incorporation has on supply chain integration. The study findings established that to a large extent use of electronic procurement helps facilitate supply chain integration.

Soysal and Calipinar (2012) carried out a study on e-procurement practices in the health segment in Turkey. The study aims were to ascertain impacts that adoption of e-procurement practices has on performance of the health sector in turkey. The study findings indicated that to a great extent various activities which involve flow of drugs from the doctors to the patients can be improved by use technology in their procurement processes. In addition, the study results: adoption of e-procurement implementation has appositive impact on performance of health sector. However, the study was sole based on the Health segment in Turkey. In addition, the study was based on Turkey and hence the study findings would not be applicable to the African context. The study was conversely grounded in Malaysian context and hence the findings would not be applied in the Kenyan context.

Rasheli (2015) in his study on Procurement management of local government authorities (LGAs) in Tanzania, the study was however based on procurement management practices and not e-procurement practices. In addition, the study was based in Tanzania and hence may not be applicable to the Kenyan universities.

Mukhari (2013), studied on e-procurement technologies agro-based SME's in Malaysia with the drive of ascertaining the impact that adoption of e-procurement technologies has on performance of agro-based SME's in Malaysia. The study carried out a cross sectional study where it adopted use of descriptive research design. The study findings established that the adoption e-procurement is affected by factors like cost, commitment. However the study was based in Malaysia and hence the findings could not be applicable to the Kenyan public universities.

A study carried out by Quesada (2016) on the effect of e-procurement performance ascertained that there is a constructive effect of procurement practices implementation and overall performance of the firm .The purpose of the study stood to ascertain the effect of e-procurement implementation on procurement management practices implementation and performance .However the study was solely based on the effect of e-procurement implementation on performance and failed to look at extent of e-procurement implementation on SCP.

Locally a study was carried out by Ndiiri (2015) in her study on e-procurement implementation and performance of county governments in Kenya, ascertained that county governments have implemented e-procurement and this helps improve the SCP. The study aim was to ascertain the impact of e-procurement on SCP in county governments in Kenya and the extent to which the e-procurement implementation had been implemented in county governments. The study adopted use of descriptive statics where data was collected from all the 47 counties. The study however, suffered from methodological weakness based on the fact that it was solely based on the county governments.

Kamau (2013) investigated the impact that e-procurement has on SCP in government parastatals in Kenya. The study aims were to ascertain the impact that e-procurement implementation has on SCP of government parastatals in Kenya and the challenges faced in the adoption. The study adopted usage of descriptive research plan of which facts was gathered through usage of questionnaire. The study established that embracement of e-procurement implementation had a positive bearing on performance of parastatals in Kenya. Besides, the study established that suppliers play an important role in acceptance of e-procurement practices. However, the study was solely based in government parastatals in Kenya.

A study by Kagai, (2013) on electronic procurement in private universities in Kenya was aimed at establishing the extent of implementation of e-procurement in private universities. The study adopted use of descriptive statistics in data collection from a sample size of 13 universities where they established that there e-procurement and SCP are related positively. The study also established to a great extent the private universities had adopted e-procurement practices. However, the study was solely based in private universities in Kenya and failed to look at public universities in Kenya.

Ngeera (2016) carried out a study on e-procurement implementation and performance of pharmaceutical firms in Nairobi. The drive of the research was to establish the influence that adoption of e-procurement practices has on performance and the extent of adoption in pharmaceutical firms. The study adopted use of 31 firms from which data collection was effected by use of organized questionnaires. The outcomes established existence of a positive relationship between adoption of e-procurement practices and SCP in pharmaceutical firms in Kenya. In addition, the study established that to a large extent the

various e-procurement practices had been adopted in various pharmaceutical firms in Kenya. However, the study was solely based on pharmaceutical firms in Nairobi and failed to look at public universities in Kenya.

A study by Okumu, (2017) on the effect of adoption of electronic procurement and SCP in dairy firms in Kenya, was aimed at ascertaining the various e-procurement implementations and the impact that adoption of e-procurement practices has on performance. The study adopted use of descriptive statics. The study results indicating implementation of e-procurement practices and SCP of dairy firms in Kenya are related positively. The study established that to a large extent the various dairy firms had implemented e-procurement practices. However, the study was solely based on dairy firms in Kenya.

2.7 Summary of Literature Review

This section contains a summary of literature review on e-procurement practices.

Table 2.1 A summary of Literature Review

Scholars (s)	The study	Major Findings	Research Gaps
Kinoti(2013)	E-procurement adoption in government parastatals in Kenya: the supplier perspective	Suppliers are key in the determination of implementation of e-procurement	The research was based on the role of suppliers in e-procurement adoption and failed to look at the effect of its adoption on SC performance
Ngeera (2016)	E-procurement and operational performance of pharmaceutical firms in Nairobi	Adoption of e-procurement has a positive impact on performance	The study was solely based on pharmaceutical firms in Nairobi
Onjala(2017)	Electronic procurement	Adoption of e-procurement practices has led	The study was solely based

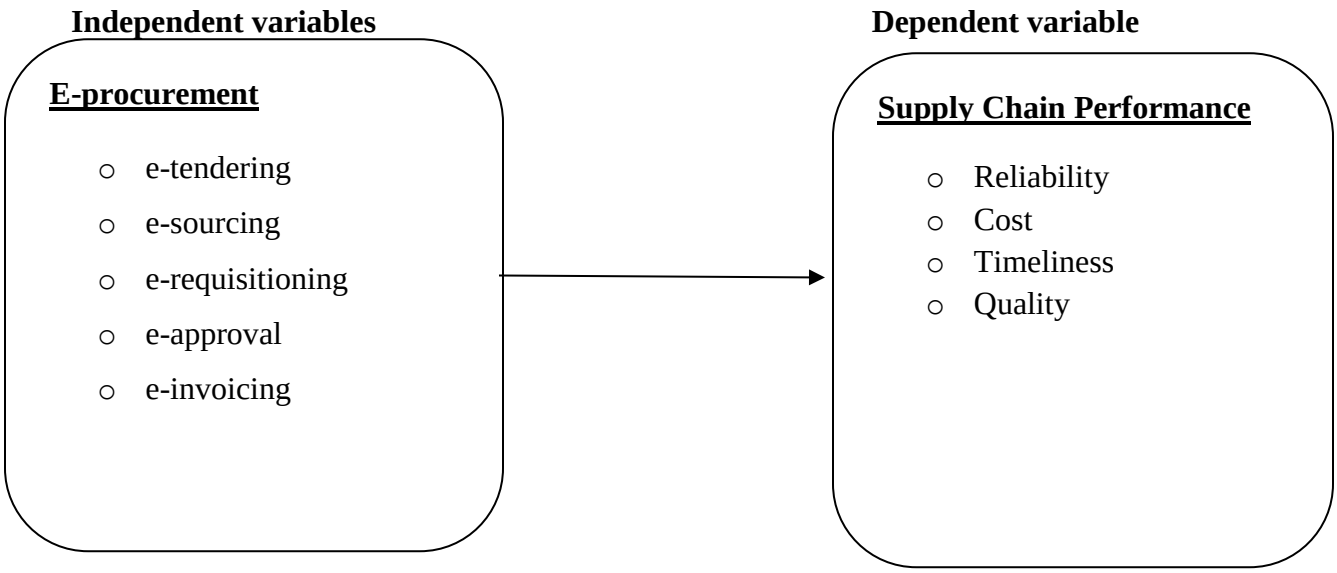
	and SCP	to increased transparency, reduced lead times	on agro-processing diary firms
Calipinar (2012)	e-procurement in the health sector in Turkey	Use of technology improves the system of supplies of drugs in the pharmacies	The study was solely based in Turkey and hence the results could not be applicable in the Kenyan sector
Mukherje (2013)	E-procurement technologies in agro based SME's	Factors like costs, commitment, quality among others affect adoption of e-procurement practices	The study was based in the Malaysian context and hence the findings could not be applicable in the Kenyan context
Addison (2016)	E-procurement adoption in Ghana	There is a positive relationship between IT infrastructure and the adoption of e-procurement practices	The study was based in Ghana and the studies failed to look at e-procurement practices

Quesada (2016)	E-procurement effect on procurement management practices and performance	A positive relationship exists between e-procurement and procurement management practices	The study failed to tackle on e-procurement implementation and performance in pharmaceutical firms in Nairobi

2.8 Conceptual Framework

It shows: Independent variables are: E-procurement practices include: e-tendering e-sourcing, e-requisitioning, and e-invoicing while the dependent variable is SCP. SCP indicators are reliability, cost, timeliness, transparency and quality.

Figure 2.1: Conceptual Model



Source: DeLone & McLean *(*2003)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The segment contains information about the plan of the research and population that was used for the study. The techniques that were used in data collection and analysis and presentation are also highlighted in this chapter.

3.2 Research Design

This study used descriptive research plan in meeting the study objectives. This design was used as the researcher has interest in the state of affairs in a particular field and the variables should not be manipulated. It would facilitate the researcher's ability to meet the research objectives (Mugenda & Mugenda, 2008). This research design facilitated the researcher's' ability to meet the study objectives.

3.3 Target Population

The population of the study was the public universities in Kenya which are 31 in number as attached in appendix II. According to the ministry of education, 2017, there are 31 public universities in Kenya. A census was carried out for this study founded on the circumstance that the study population is relatively small.

3.5 Data Collection

Data collection of primary data was through use of structured questionnaires. The questions were constructed in a manner that they were able to address specific objectives and offer a variety of possible responses. The questionnaires were sent to the heads of the various supply chain departments or their equivalent of the public universities in Kenya. Section A of the questionnaire contained the background information of the respondents,

section B contained information on the extent of adoption of e-procurement practices, section C contained information on the effect of e-procurement practices on performance of public universities and Section D was based on the barriers in the implementation of e-procurement.

3.6 Data Analysis

Data collected was screened for accuracy, consistency, uniformity and completeness in preparation for analysis. Data for object one on the extent of adoption of e-procurement implementation was analyzed by use of descriptive statics, data from objective two on the effect of e-procurement implementation was analyzed by use of regression. Descriptive statistics was used in analyzing data on barriers of e-procurement implementation of adopting e-procurement implementation in public universities in Kenya. The regression model was: $Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$ Where; Y = Supply chain performance, α – This is a constant and β_1, β_2, β_3, β_4 and β_5 being constants regression coefficients

X_1 – e-tendering,

X_2 – e-sourcing,

X_3 – e-requisitioning,

X_4– e-approval

X_5-e-invoicing and ε - Error term

CHAPTER FOUR: DATA ANALYSIS, RESULTS, AND DISCUSSION

4.1 Introduction

This part entails: Data analysis, findings and interpretation of the study findings on the objectives of the study which were to ascertain the implementation of e-procurement management practices on SC performance in public universities in Kenya.

4.2 Response Rate

The population of the study was made up of all the 31 public universities in Kenya. Structured questionnaires were issued to the respondents who were made up of the supply chain managers, procurement managers or their equivalent. Out of 31 questionnaires that were issued, 28 were dully filled and returned for data analysis and were checked for completeness. This response rate is 90% and it is deemed adequate to support this study since based on Mugenda (2015) a response rate above 70% is seen as very good.

Table 4.1: Survey Response Rate

Response	**Frequency**	**Percent**
Returned	28	90%
Not returned	3	10%
Total	**31**	**100%**

Research data (2018)

4.3 General Information

Biographic data entails data on the gender, education background and experience of the respondents which helps in evaluating the weight and the viability of the study to the respondents. Background checks were carried out to establish the relationship between the information gathered on their experience, education level and the knowledge sought. Background data was sought on:

4.3.1 Gender

Table 4.2 Gender

	Frequency	Percent
Males	13	46
Females	15	54
Totals	28	100.0

Research data (2018)

From the table results above: 46% were male while 54% were female an indication that the there was no gender biasness in the responses.

4.3.2 Education

The outcomes on education indicated that 18% had a certificate level of education, 7% had diploma level of education, 46% had a degree level of education while 25% had masters level of education. This shows that all the employees in the procurement department who were the respondents had relevant professional knowledge on the data sought on e-procurement management practices

Table 4.3 Education

Education level	Frequency	Percent
Certificate	5	18
Diploma	2	7
Degree	13	46
Masters	8	25
Total	28	100

Source: Researchers Data (2018)

4.4. Implementation of Electronic Procurement

Based on the first goal of the study which was to inaugurate the extent of implementation of e-procurement on performance of public universities in Kenya.The discoveries are as shown in the Table 4.4:

Table 4.4 Implementation of Electronic Procurement

	Mean	**Std. Deviation**
3EE-requisitioning	3.1143	.63113
E-sourcing	3.4000	.69452
E-tendering	3.6286	.80753
E-approval	3.4857	.70174
E-payments	3.8000	.63246

Source, Researchers Data *(*2018)

The study discoveries overhead shows that to a moderate extent entire electronic procurement practices had been implemented by the INGO's in Nairobi as indicated: E-requisitioning indicated a mean of 3.1, E-sourcing indicated a mean value of 3.4 E-tendering indicated a mean value of 3.6, E-approval indicated a mean value 3.5 while E-payments indicated a mean value of 3.8. From this it indicates the e-procurement

management practices have been adopted to moderate extent in public universities in Kenya.

4.5 Effect of E-procurement on Quality

The next aim of the study was to indicate the effect of e-procurement on performance of Public Universities in Kenya. The results of multiple regressions that were carried out are as indicated below.

4.5.1 Coefficients

The table in the next page represents the regression analysis carried out on the e-procurement management practices and quality.

$$Y = \alpha + 0.419\,X_1 + 0.137\,X_2 + 0.425\,X_3 + 0.110\,X_4 + 0.574X5 + \varepsilon$$

Where; Y = Supply chain performance and α being constant and β_1, β_2, β_3, β_4 and β_5 are constants regression coefficients

X_1 – e-tendering,

X_2 – e-sourcing,

X_3 – e-requisitioning,

X_4– e-approval

X_5-e-invoicing and ε - Error term

Table 4.5 Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	7.144	1.168		6.118	.000
e-requisitioning	.419	.021	.149	.823	.017
e-approvals	.137	.276	.131	.498	.624
e-sourcing	425	.213	.459	.992	.059
e-tendering	.110	.315	.092	.349	.731
e-invoicing	.574	.300	-.378	.914	.069

Source :Research Data (2018)

a. Dependent Variable: quality

b. Predictors: (Constant), e-requisitioning , e-approvals-sourcing , e-tendering, e-invoicing

From the table above, none of the variables is significant since all the five independent variables had P-value greater than 0.05% e-requisitioning and quality are definitely and insignificantly linked (r=0.419 p=0.017). Besides it had a 0.017 p-value an suggestion that it is substantial at 0.05 critical value since it is less than 0.05.The results further indicate that in e-approvals and quality were certainly and considerably related (r=0.937, p=0.624). This ascertains that an increase in the level to which e-approvals is adopted by one unit results to an increase in SC by 0.794 units. Besides it had 0.0624 p-value an indication that it is insignificant .E-sourcing and quality are positively and insignificantly

related (r=0.425, P=0.039).An increase in the level of adoption of e-approvals by one unit would lead to 0.425 units in quality, since the p-value was less than 0.05 at 95% confidence level. Moreover, e-tendering and quality were also positively and insignificantly related (r=0.110, p=0.731) an indication that an increase in the e-tendering by one unit results in an increase in the quality of goods by 0.110 .e-invoicing and quality were positively and insignificantly correlated (r=0.573, p=0.069). Increase in the level of adoption of e-invoicing by one unit results to a related increase in SCP by 0.0.573. It had 0.0.069 value an indication that it is insignificant at 0.05 critical value since it is less than 0.05 Hence all the e-procurement management practices in the study above affect SCP.

4.5.2 Coefficient of Determination

The coefficients of determination results are as shown below:

Table 4.6 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.655[a]	.429	.299	.73353

Source :Research Data (2018)

a. Dependent Variable: Quality

b. Predictors: (Constant), e-requisitioning , e-approvals-sourcing , e-tendering, e-invoicing

R squared value is 43% meaning that 42% of the variations in quality is explained by the variations in the independent variables. Unexplained variables which are factors that not in the model and occur by pure chances. 57% indicate that this is a fair model.

4.5.3 ANOVA

Table 4.7 ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	8.877	5	1.775	3.300	.023[b]
Residual	11.837	22	.538		
Total	20.714	27			

Source: Research Data (2018)

The findings indicate that the overall model was statistically substantial since p-value is less than 0.05. Hence the independent variables are good predictors of SCP. In addition, by an F statistic of 3.300 this is greater than F-calculated of 2.82 with a p value (0.000) which was less than 0.05. Numerator df =5, denominator df= 22.

4.6 E-procurement practices and Timeliness

As indicated in the results in the table below shows that e-requisitioning and timeliness are positively and insignificantly related (r=0.419 p=0.017). An indication that increased levels of adoption of e-requisitioning by one unit results to an increase in SCP by 0.419 units. Besides it had a 0.017 p-value a suggestion that it is substantial at 0.05 critical values since it is less than 0.05. An increase in the level of adoption of e-approvals and timeliness are completely and suggestively related (r=0.937, p=0.624). These results imply that an increase in the unit change in e-approvals would lead to an increase in the SCP by 0.794 units. Besides it had 0.0624 p-value an indication that it is insignificant. E-sourcing and quality are positively and insignificantly related (r=0.425, P=0.039) an indication that an increase in the level to which e-approvals is adopted by one unit leads to 0.425 units in timeliness, since the p-value was less than 0.05 at 95% confidence

level. Moreover, e-tendering and timeliness were also positively and insignificantly related (r=0.110, P=0.731) an indication that an upsurge in the level of espousal of e-tendering by one unit results in an increase in the timeliness by 0.110 .E-invoicing and timeliness are positively and insignificantly correlated (r=0.573, p=0.069). An intensification in the level of implementation of e-invoicing by one unit results in an increase in timeliness by 0.0.573. It had 0.0.069 value an signal that it is substantial at 0.05 critical value since it is less than 0.05 Hence all the e-procurement management practices in the study above affect SCP

4.6.3 Coefficients

Table 4.7 Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	7.144	1.168		6.118	.000
e-requisitioning	.419	.021	.149	.823	.017
e-approvals	.137	.276	.131	.498	.624
e-sourcing	425	.213	.459	.992	.059
e-tendering	.110	.315	.092	.349	.731
e-invoicing	.574	.300	-.378	.914	.069

Source: Research Data (2018)

a. Dependent Variable: Timeliness

b. Predictors: (Constant), e-requisitioning , e-approvals-sourcing , e-tendering, e-invoicing

The study regression model therefore becomes,

$Y = \alpha + 0.419 X_1 + 0.137 X_2 + 0.425 X_3 + 0.110 X_4 + 0.574 X5 + \varepsilon$

Where; Y = Supply chain performance and α being a constant

β_1, β_2, β_3, β_4 and β_5– Are constants regression coefficients

X_1 – e-tendering,

X_2 – e-sourcing,

X_3 – e-requisitioning,

X_4– e-approval

X_5-e-invoicing and ε - Error term explaining the

4.7.2 Coefficients of Determination

Table 4.8 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.682[a]	.466	.313	.72608

Source: Research Data (2018)

a. Dependent Variable: Flexibility

b. Predictors: (Constant), e-requisitioning , e-approvals-sourcing , e-tendering, e-invoicing

R squared value is 47% meaning that 47% of the variations in flexibility is illuminated by the variations in the independent variables. Unexplained variables which are factors that

not in the model and occur by pure chances which are 53 % indicate that this is a poor model.

4.6.3 ANOVA

ANOVA[a]

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	9.643	5	1.607	3.049	.026[b]
Residual	11.071	22	.527		
Total	20.714	27			

Source: Research Data (2018)

From the results above, e-requisitioning, e-approvals-sourcing, e-tendering, e-invoicing e-Further, are good predictors of SCP. Besides F statistic of 3.049, which is greater than F-critical of 2.82 and the reported p value (0.000) which was less than 0.05 shows that the model is significant? Numerator df =5, denominator df= 22.

4.7. Effect of E-procurement on Reliability

The findings on the effect on e-procurement on reliability are as shown below:

4.7.1 Coefficients

Regression of coefficients results in Table 4.14 below shows that e-requisitioning and reliability are positively related. Besides it has a p-value of 0.725 and hence it is not statistically significant. The results further indicate that in e-approvals and reliability were positively related. It further indicated a p-value of p=0.558 hence it is significant since it is less than 5%. It was further established that e-sourcing and quality were

positively related with a p-value of 0.005 hence it is significant since it is less than 0.05 at 95% confidence level. Moreover, e-tendering and reliability were also positively with a significant level of p=0.006 hence it is significant. E-invoicing and reliability were positively correlated with a significant level of 0. 40 Hence it is significant. Hence all the e-procurement management practices in the study above affect SCP. The table 4.9 below shows the coefficients values:

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.403	1.264		2.692	.014
e-requisitioning	.057	.160	.094	.356	.725
e-approvals	.067	.113	.125	.595	.558
e-sourcing	-.521	.165	-.591	-3.154	.005
e-tendering	.445	.146	.502	3.043	.006
e-invoicing	.337	.154	.485	2.194	.040

Source: Research Data (2018)

$Y = \alpha + 0.057 X_1 + 0.067 X_2 + 0.521 X_3 + 0.445 X_4 + 0.337x5 + Ɛ$

Where;

Y = Supply chain performance

α – This is a constant

β_1, β_2, β_3, β_4 and β_5– Are constants regression coefficients

X_1 – e-tendering,

X_2 – e-sourcing,

X_3 – e-requisitioning,

X_4– e-approval

X_5-e-invoicing

Ɛ - Error term

4.8.2 Coefficients of Determination

4.10 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.776[a]	.602	.488	.36324

Source: Research Data (2018)

R squared value is 60% meaning that 60% of the variations in reliability is explained by the variation in the independent variables. Unexplained variables which are factors that not in the model and occur by pure chances which are only 40 % indicate that this is a fair model.

As indicated below analysis of the variance (ANOVA) : the inclusive model was statistically substantial based on the fact that the p-value is less than 0.05.Besides, F statistic of 3.300 which is greater than F-calculated of 2.82 and the reported p value

(0.000) which was less than 0.05 indicate that the model is significant. Numerator df =5, denominator df= 22.

4.8.3 ANOVA

ANOVA[a]

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	4.193	5	.699	5.297	.002[b]
Residual	2.771	22	.132		
Total	6.964	27			

Source: Research Data (2018)

4.9 Effect of E-procurement Management Practices on Cost

The second aim of this research was to ascertain the effect of implementation of e-procurement management practices on SCP. The results from the regression analysis between e-procurement practices and cost are as indicated below:

4.9.1 Coefficients

The table on the next page represents the regression analysis carried out on the e-procurement management practices and SC performance as indicated in table 4.14 below:

The results indicate e-requisitioning and SCP are positively and significantly related (r=0.800, p=0.041). This shows that an increase the level to which e-requisitioning is adopted, affects SCP by 0.800 units. A p=0.041 indicates it is significant since it is less than 0.05. E-approvals and SCP were positively and significantly related (r=0.794, p=0.000). These results imply that an increase in the level of adoption of e-approvals by one unit results to an increase in the SCP by 0.794 units. A P=0. 000indicates it is

significant since it is less than 0.05. E-sourcing and SCP are positively and insignificantly related (r=0.534, p=0.081). Meaning: a unit change in e-approvals would lead to 0.534 units in SCP, since the p=0.081 value was less than 0.05. Moreover, e-tendering and SCP are positively and significantly correlated (r=0.765, p=0.028) an indication that an increase in the e-tendering by one unit results in an increase in the SCP by 0.765.E-invoicing and cost were positively and significantly correlated (r=0.771, p=0.004). An increase in the adoption of e-invoicing results to cost reduction by 0.0.456.A p=0.004 indicates that it is significant Hence all the e-procurement management practices in the study above affect SCP.

Table 4.11 Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	1.389	1.422		.977	.344
e-requisitioning	.800	.187	.166	1.097	.041
e-approvals	.794	.151	.772	5.266	.000
e-sourcing	.543	.121	.128	.863	.061
e-tendering	.765	.158	.041	.258	.003
e-invoicing	.771	.217	.048	.296	.004

Source: Research Data (2018)

a. Dependent Variable: Cost b),Independent variables : (Constant), e-requisitioning , e-approvals-sourcing , e-tendering, e-invoicing

$Y = \alpha + 0.800\ X_1 + 0.794\ X_2 + 0.543\ X_3 + 0.765 X_4 + 0.771x5\ Ɛ$

Where; Y = Supply chain performance

α – This is a constant

β_1, β_2, β_3, β_4 and β_5– Are constants regression coefficients

X_1 – e-tendering,

X_2 – e-sourcing,

X_3 – e-requisitioning,

X_4– e-approval

X_5-e-invoicing and ε - Error term

4.5.2 Coefficient of Determination

The table below represents the findings:

4.12 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.773[a]	.597	.555	.57383

Source: Research Data (2018)

R squared value is 60% meaning that 60% of the variations in reliability is explained by the variation in the independent variables. Unexplained variables which are factors that not in the model and occur by pure chances which are only 40 % indicate that this is a fair model.

4.9.3 ANOVA[a]

Analysis of variance was carried out on the regression model and the results are as presented in Table below:

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	8.315	5	2.772	15.424	.000[b]
	Residual	5.571	22	.180		
	Total	13.886	27			

The model is significant since the p-value is less than 5%. Furthermore, shows the overall model is significant. F statistic of 15.424 which is greater than F-calculated 2.82 and the reported p value (0.000) which was less than 0.05. Numerator df =5, denominator df= 22.

4.10 Barriers Faced in Implementation of E-procurement Management Practices

The third objective of the study was to ascertain the barriers faced in the Implementation of e-procurement management in public universities in Kenya. The study findings indicate as in the table below: that to a small extent, they faced a challenge of resistance to change by staff indicated a mean value of (M=3.5,SD=0,61) high costs of implementation of e-procurement which was indicated by a mean value of (M=2.00,SD= 0.68) high costs of training staff with a mean value of (2.9,SD=048), the challenge of inadequate technological infrastructure as indicated by a mean value of (M=2.8,SD=0.70) Non supporting organizational culture as indicated by a mean value of (M=2.8,SD=0.53) Lack of performance measurement systems indicated a mean value

of 3.6 and Lack of supplier interests or support with a mean value of (M=2.54,SD=0.42) as indicated below: This is an indication that Public universities face various challenges in their quest to adoption of e-procurement practices.

Table 4.13 Descriptive Statistics

Resistance to change	3.9429	.61159
High costs of implementation of e-procurement	3.9143	.61220
High costs of training staff	3.6857	.47101
Inadequate technological infrastructure	2.8286	2.8286
Non supporting organizational culture	2.8000	.53137
Lack of performance measurement systems	2.5429	.42376

4.11 Discussions

This study's main purpose was to establish the implementation and performance of e-procurement adopted by public universities in Kenya. The findings of the study as indicated above ascertained that to a large extent, public universities in Kenya use e-requisitioning, e-approvals, e-invoicing, e-tendering, e-sourcing as e-procurement management practices in their procurement processes. This was indicated as per the results whereby descriptive analysis carried out on each and every variable, indicated that all the five e-procurement management practices had a mean value greater than three an indication that they had been implemented in the public universities in Kenya.

From the findings, e-requisitioning indicated a mean value of 4.422, e-approvals indicated a mean value of 3.801, e-sourcing indicated a mean value of 3.613, e-tendering indicated a mean value of 4.000 and e-invoicing indicated a mean value of 3.90. From these findings it was an indication that the e-procurement management practices indicated above is used in the public universities in Kenya.

The second purpose of this research effect of e-procurement management practices on SCP of public universities in Kenya. To get this the study used regression analysis to indicate the effect of e-requisitioning, e-approvals, e-invoicing, e-tendering, e-sourcing and SC performance in public universities in Kenya. From the results of regression analysis carried out on the E-requisitioning, e-approvals, e-invoicing, e-tendering, e-sourcing against performance indicated by cost, quality, timeliness, flexibility, the results indicated a positive relationship between the e-procurement management practices and SCP of public universities in Kenya. Based on the third objective, the study established that high costs of implementation of e-procurement, high costs of training staff, Resist stance to change by staff, Inadequate technological infrastructure among others were various challenges experienced to a moderate in the quest of firms to adopt e-procurement management practices.

From the findings it was ascertained that use of e-procurement management practices in the firm have a positive impact on SC performance whereby: e-requisitioning had a coefficient of 0.810, e-approvals had a coefficient value of 0.094, e-sourcing had a coefficient of 0.543, e-tendering had a coefficient value of 0.765, e-invoicing had a correlation of 0.771 hence all the e-procurement management practices have a positive affect SCP in the public universities in Kenya.

Besides the regression analysis was carried out where the e-procurement management practices were regressed against SCP established that 43% of quality and timeliness, 60% of reliability and 59% of cost as SCP indicators of public universities in Kenya is affected by implementation of e-procurement management practices by public universities in Kenya. This indicated that the use of e-procurement management practices has a great impact on the SCP.

This study is in line with a study carried out by Quesada (2016) on the effect of e-procurement on procurement practices and performance ascertained that e-procurement has a positive effect to procurement practices implementation and overall performance of the firm. Ndiiri (2015) in her study on e-procurement implementation and performance of county governments in Kenya, ascertained that county governments have implemented e-procurement and this helps improve the supply chain performance. Kamau (2013) investigated the impact that e-procurement has on supply chain management performance in government parastatals in Kenya. The study established that the implementation of e-procurement implementation has a constructive bearing on performance of parastatals in Kenya. Besides, the study established that suppliers play an important role in the adoption of e-procurement practices. A study by Kagai, (2013) on electronic procurement in private universities in Kenya established to a great extent the private universities had adopted e-procurement practices. However, the study was solely based in private universities in Kenya and failed to look at public universities in Kenya.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Summary of the outcomes, the assumptions and the recommendations makes up this chapter. The study objectives were to ascertain the extent to which the e-procurement management practices had been implemented in public universities in Kenya, to inaugurate the influence of e-procurement management practices on SCP of public universities in Kenya and the barriers to the implementation of e-procurement management practices.

5.2 Summary of Findings

This segment provides a summary of the discoveries from the analysis as per the goals of the study. For data analysis, questionnaires were issued to the respondents who were represented by thirty one questionnaires. The main determination of this study was to ascertain the degree to which e-procurement management practices had been implemented in public universities in Kenya, their effect on SC performance and the impact on SCP and barriers to their application in public universities in Kenya. The results of the study established that public universities in Kenya had adopted use of e-procurement management practices to a large extent indicated by mean values greater than three. The second objective of this study was to establish the impact of e-procurement management practices on SC performance of public universities in Kenya. The results ascertained that e-procurement management practices affected performance positively. This was indicated by a constructive association amongst the e-procurement management practices and SCP which was measured by cost, quality, timeliness,

reliability and customer satisfaction. From regression analysis 70.4% of the independent variable which was SC performance was well explained by the e-procurement management practices used in public universities in Kenya.

5.3 Conclusion

Public universities are key to our economy based on their ability to offer high quality and affordable education to the population. Effectiveness in processes of a firm is exceedingly endorsed to the manner that the organization manages their supply chain management procedures. The findings indicated that to a large extent, e-procurement management practices had been adopted in public universities in Kenya. This was specified by constructive mean values above three and indication that all the practices had been implemented to a large extent. The findings from the regression analysis designated that e-procurement management practices to a moderate degree have consequence on SCP in the public universities in Kenya.

For firms to achieve efficiency of their operations there is need for adequate management of their procurement process. Implementation of e-procurement management practices is crucial in the urge by firms to achieve high quality services at low costs in the firms. It facilitates the firm's ability to meet daily customer needs and requirements in the firms due to fast, low cost operations which are transparent in the firm. Hence adoption of e-procurement management practices is key in the urge of the firm to achieve high quality services at low cost.

5.4 Recommendations for Policy and Practice

From these study discoveries, it was proven that most of the public universities in Kenya had realized e-procurement management practices. However, a few have not applied the numerous e-procurement management practices used in this study, there is need for the management to incorporate use of e-procurement management practices in order to improve their performance and competiveness. The study recommends that organizational employees especially from the supply chain should be trained further on e-procurement practices and the need for the same towards boosting overall firm performance of firms. The public universities in Kenya should therefore invest resources on training of employees so as to boost their performance through e-procurement. The public universities need to curb the challenges facing the implementation of e-procurement management practices to attain improved performance.

5.5 Limitations of the Study

The study findings were applicable to the public universities only. Hence the findings are not applicable to the private sector. Inability to have adequate resources that are to be used in data collection was also a major challenge and hence the study was not in a position to collect data from all public universities in Kenya. The respondents were located in different locations making data collection a challenge. Reluctance of some respondents in giving out information on the study was also a challenge in the study. However, the researcher tried as much as possible to get a good response rate. Besides, some of the respondents did not accept the questionnaires thus making it a challenge to effectively carry out the study.

5.6 Suggestions for Further Research

The study sought to determine the e-procurement management practices used in public universities in Kenya. Further studies need to be carried out on other sectors other than public universities in Kenya. In addition, future studies should consider other supply chain practices with an aim of establishing their effect on SCP. This therefore means that a different industry apart from public universities in Kenya should be considered in future studies. Further studies need to be carried out on the various variables that were not included in the four regression models against cost, reliability, timeliness and quality which represented the unexplained variables. There is need for further research in identifying the various variables that cause inability of public universities to achieve 100% SC performance and improve on them to facilitate improved levels of performance.

REFERENCES

Addison, D. (2016).Implementation and Adoption of E-procurement in Ghana Public sector: The way forward. *Unpublished Dissertation Kwame Nkrumah University of Science and Technology, Kumasi, Ghana*

Calipinar, H., & Soysal, M. (2012).E-procurement: A case study about the Health Sector in Turkey .*International journal of Business and Social science, 3(7)232244*

Birech, K. W. (2011). *The effect of performance contracting strategy on the Performance of state corporations in the Energy sector in Kenya.* Unpublished MBA Thesis University of Nairobi.

Birks, C., Bond, and S. & Radford, M. (2001) .Guide to e-Procurement in the Public Sector: Cutting through the Hype. London, UK: Office of Government Commerce, HMSO.

Calipinar, H., & Soysal, M. (2012). E-Procurement: A Case Study about the Health Sector in Turkey. International Journal of Business and Social Science, 3(7) 232-244

Chemoiywo, K. P. (2014). Public procurement procedures and supply chain performance in state corporations in Kenya.

Kmarulzaman, N.H., &Mohamed, Z, .A (2013).Application of e-procurement technologies for selecting suppliers of agro based SME's in Malaysia. *International journal of economics and management,* 7(1), 45-66

Kinoti, J.T. (2013).E=procurement adoption by government parastatals in Kenya: the supplier perspective .*An unpublished master's thesis of the University of Nairobi*

Kalakos, R., and Robinson, M. (1999) e-Business: A Roadmap for Success. Reading, MA. Addison-Wesley.

Kamotho, K. D. (2014*). E-Procurement and procurement performance among state corporations in Kenya*. An unpublished master's thesis of the University of Nairobi.

Kumar, V. K. N., & Srinivasan, B. (2013). Implementation and performance effect on electronic procurement and its ship management companies in India. *Information Engineering and Electronic Business*, 2013, 5, 10-16

Mose, J. M., Njihia, J. M. & Magutu, P. O. (2013). The critical success factors and challenges in e-procurement adoption among large scale manufacturing firms in Nairobi, Kenya. *European Scientific Journal edition*, 9(13) ISSN: 1857 – 7881 (Print) e - ISSN 1857- 7431 376

Muhia, D. W., & Afande, W. F. (2015). Adoption of E-Procurement Strategy and Procurement Performance in State Corporations in Kenya (A Case of Kenya Revenue Authority). Industrial Engineering Letters, 5(6) 2015.

Musau, E. G. (2015). Inventory optimization: a factor affecting e-procurement performance of State Parastatals in Kenya. *Journal of Business and Management* 2319-7668. 17(4), 41-50.

Ngeno, R. K., & Omwenga, J. Q. (2015) Factors contributing to adoption of e-procurement in County Governments: A Case Study of County Government of Bomet. *International Journal of Academic Research in Business and Social Sciences*, 5(10) 5**-19**

Kinoti. (2013). Implementation of e-procurement practices among private hospitals in Nairobi, Kenya. A*n unpublished master's thesis of the University of Nairobi.*

Otieno, F., Muthoni, N., & Mungai, S. (2013). Factors affecting use of e-procurement: a survey in selected firms in Kisii Town, Kenya. *Interdisciplinary Journal of Contemporary Research in Business, 5(4)*

Oyamo, E. A., & Mburu, D. K. (2014). Effects of procurement processes on the distribution of pharmaceutical drugs in public hospitals in Kenya A case of Mission for Essential Drugs and Supplies (MEDS). *Prime Journal of Social Science* (PJSS), 3(5) 721-732

Rotich, G. K., & Okello, B. (2015). Analysis of use of e-procurement on performance of the procurement functions of County Governments in Kenya. International *Journal of Economics, Commerce and Management United Kingdom*, III (6)

Sijaona, K. (2010). 3rd East African Procurement Forum – White Sands Hotel, Dar es salaam, Tanzania – 29th Sept-1st. e-procurement in Tanzania

Subramani, P. (2004). A study on manufacturing resource planning (MRP II) practices in Singapore, Omega, 21(2),.187-197.

Tanner, C., Wolfle, R., Schubert, P., & Quade, M. (2007). Current Trends and Challenges in Electronic Procurement: An Empirical Study. Merging and Emerging Technologies, Processes, and Institutions; Bled, Slovenia 20(4), 59-65

Thuranira, J. K. (2013). *E-procurement adoption by government parastatals in Kenya: the supplier perspective*. An unpublished master's thesis of the University of Nairobi

APPENDIX 1: Questionnaire

This questionnaire is intended to provide information for the study on e-procurement and supply chain Performance of public universities in Kenya. Please note that the information provided will be used for academic purpose only and will be treated with utmost confidentiality.

Please answer the following questions by ticking (√) in the appropriate box or by giving the necessary details in the spaces provided.

SECTION A: GENERAL INFORMATION

1. Kindly indicate your gender: Male [ ] Female [ ]

2. Level of Education Attained

Primary [ ]

Secondary [ ]

Technical / Vocational [ ]

Undergraduate [ ]

Postgraduate [ ]

3. Work experience (Years)

Less than 5 years [ ] 5-10 years [ ] Over 10 years [ ]

SECTION B THE EXTENT OF IMPLEMENTATION OF E-PROCUREMENT ON PERFORMANCE

Please indicate whether your university has implemented the following e-procurement activities, by indicating the extent your organization has implemented the following e-procurement practices Tick where appropriate,

1- **Not at all 2-Small extend 3-Moderate extend 4-Great extend 5-Very great extend**

PRACTICE	**YES**	**NO**	**1**	**2**	**3**	**4**	**5**
e-Tendering							
The firm sends requests for quotations to suppliers online							
The firm receives responses from suppliers online							
e-Sourcing							
The firm identifies new suppliers through the internet							
Suppliers submit bids over internet							
e-Requisitioning							
Requisitions by staff are made by the staff online							
Specifications of items ordered is made online							
e-Approval							
Approvals for requisitions are done online							
Posting item specifications is done online							
e-Invoicing							

Invoices are receives by the firm through the internet							
The firm makes supplier payments electronically							

SECTION C: SUPPLY CHAIN PERFORMANCE

Indicate to what extend Implementation of e-procurement has affected supply chain performance.

Key 1-Not at all 2-Small extentt 3-Moderate extentt 4-Great extentt 5-Very great extentt

PRACTICE	1	2	3	4	5
e-Tendering					
Reduction in procurement costs					
Better quality of supplied products					
Reduction in operational costs					
Improved customer satisfaction					
e-sourcing					
Reduction in procurement costs					
Better quality of supplied products					
Reduction in operational costs					
Improved customer satisfactions					
E-Requisitioning					
Reduction in procurement costs					

Better quality of supplied products					
Reduction in operational costs					
Improved customer satisfaction					
e-Approval					
Reduction in procurement costs					
Better quality of supplied products					
Reduction in operational costs					
Improved customer satisfaction					
e-Invoicing					
Reduction in procurement costs					
Better quality of supplied products					
Reduction in operational costs					
Improved customer satisfaction					

SECTION D: BARRIERS IN E-PROCUREMENT IMPLEMENTATION

Please indicate the level of agreeing to which extent the following barriers of e-procurement implementation is to your firm.

Key:

(1) Not at all (2) Small extentt (3) Moderate extent (4) Great extent (5) Very great extentt

Challenge	1	2	3	4	5
High costs of implementation of e-procurement					
High costs of training staff					
Resist stance to change by staff					
Inadequate technological infrastructure					
Non supporting organizational culture					
Lack of performance measurement systems					
Lack of supplier interests or support					

Thank you for your cooperation

APENDIX 2.

ACCREDITED PUBLIC UNIVERSITIES IN KENYA – MARCH 2017

ACCREDITED UNIVERSITIES	YEAR OF ESTABLISHMENT	YEAR OF AWARD OF CHARTER
Public Chartered Universities In Kenya		
1. Chuka University	2007	2013
2. Dedan Kimathi University of Technology	2007	2012
3. Egerton University (EU)	1987	2013
4. University of Embu	2011	2016
5. Jaramogi Oginga Odinga University of Science and Technology	2009	2013
6. Jomo Kenyatta University of Agriculture and Technology (JKUAT)	1994	2013
7. Karatina University	2010	2013
8. Kenyatta University (KU)	1985	2013
9. Kibabii University	2011	2015
10. Kirinyaga University	2011	2016
11. Kisii University	2007	2013
12. Laikipia University	2009	2013
13. Maasai Mara University	2008	2013
14. Machakos University	2011	2016

15. Maseno University	2001	2013
16. Masinde Muliro University of Science and Technology (MMUST)	2007	2013
17. Meru University of Science and Technology	2008	2013
18. Moi University (MU)	1984	2013
19. Multimedia University of Kenya	2008	2013
20. Murang'a University of Technology	2011	2013
21. Pwani University	2007	2013
22. Rongo University	2011	2016
23. South Eastern Kenya University	2008	2013
24. Taita Taveta University	2011	2016
25. Technical University of Kenya	2007	2013
26. Technical University of Mombasa	2007	2013
27. The Co-operative University of Kenya	2011	2016
28. University of Eldoret	2010	2013
29. University of Kabianga	2009	2013
30. University of Nairobi (UoN)	1970	2013
31. Kirinyaga university college	2011	2016

Source: Commission for University Education (CUE), 2017