

**E-PROCUREMENT AND OPERATIONAL PERFORMANCE OF
PHARMACEUTICAL FIRMS IN NAIROBI, KENYA**

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**A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR AWARD OF MASTER OF BUSINESS
ADMINISTRATION, UNIVERSITY OF NAIROBI**

OCTOBER, 2016

DECLARATION

This research project is my original work and has not been presented for a degree in any other university.

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D61/72647/2014

This research project has been submitted for examinations with my approval as the university supervisor.

Signed.....

Date.....

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DEDICATION

This work is dedicated to my Dad Mr. Gerald Ringera Ikiara who has been an encouragement through my life's journey. Thanks Dad for all your support throughout my studies. May our almighty God continue to keep his healing hand upon you. I LOVE YOU DAD.

ACKNOWLEDGEMENTS

I wish to acknowledge the almighty God for allowing me to pursue this degree. I will forever remain grateful to you.

Special thanks to my late Mom Joyce, for her Spiritual support throughout this academic sojourn. To my friend Gilbert and my siblings, I appreciate your moral support.

My profound gratitude goes to my supervisor Mr. Michael K. Chirchir for his commitment and personal interest in the progress of this study. His wise counsel, encouragement, patience and constructive suggestions has made this work come this far.

Thanks to all my friends for their support.

ABSTRACT

This study was set to establish the extent of e-procurement implementation by pharmaceutical firms in Kenya. In order to achieve this, the study set three research objectives namely; to establish the extent of e-procurement implementation by pharmaceutical firms in Nairobi, to determine the relationship between e-procurement and firm performance of pharmaceutical firms in Nairobi, and to find out the challenges faced by pharmaceutical firms in Nairobi when implementing e-procurement. The study used a descriptive research design to conduct the research. Questionnaires were the main data collection tools used by the researcher to collect data from the 40 respondents selected through a simple random sampling procedure. Descriptive statistics such as frequency distribution and percentages were used to analyze general information collected while means were used to analyze e-procurement practices, operational performance and challenges of e-procurement. Regression analysis was used to explain the relationship between e-procurement and organizational performance of pharmaceutical firms in Nairobi. Results revealed that E-Communication and E-Tendering are implemented to a great extent while E-Sourcing, E-Order Processing and E- Auctioning are implemented to a moderate extent. The study also established that there is a strong relationship between e-procurement and operational performance of pharmaceutical firms in Nairobi, Kenya. The study also found out that the most faced challenge is the high costs of implementing e-procurement. Other challenges faced to a moderate extent include high cost of training staff and poor e-Procurement implementation strategy. The researcher therefore recommends pharmaceutical firms to implement e-procurement in their procurement operations to improve the performance of their firms. The study also recommends that pharmaceutical firms should manage the rising costs associated with implementing e-procurement. On the other hand, the study encountered non-response while conducting the research. Some of the respondents also had difficulty understanding the questions in the questionnaire. Finally, the study recommends further research to be carried out in non-pharmaceutical firms order to improve on the study findings and policy change recommendations arising from this study to facilitate making of more adequate conclusions

TABLE OF CONTENTS

DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGEMENTS	iv
ABSTRACT	v
ABBREVIATIONS AND ACRONYMS	ix
LIST OF TABLES	x
LIST OF FIGURES	xi
CHAPTER ONE: INTRODUCTION	1
1.1 Background of the Study	1
1.1.1 E-Procurement	1
1.1.2 Operational Performance	2
1.1.3 Pharmaceutical Manufacturers in Kenya	3
1.2 Research Problem	3
1.3 Research Objectives	4
1.1.3 Specific Objectives	5
1.4 Value of the Study	5
CHAPTER TWO: LITERATURE REVIEW	6
2.1 Introduction.....	6
2.2 Theoretical Literature Review	6
2.2.1 Technology Acceptance Model	6
2.2.2 Technology Organization Environment.....	7
2.2.3 Innovation Diffusion Theory	7
2.2.4 Conclusion on the Theoretical Literature Review	8
2.3 E-procurement Implementation	8
2.3.1 E-Sourcing	8
2.3.2 E-Tendering	8
2.3.3 E- Auctioning.....	9
2.3.4 E-Order Processing	9
2.3.5 E-Communication	9
2.4 E-procurement Implementation and Operational Performance	10

2.5 Empirical Literature Review.....	10
2.6 Challenges of E-procurement Implementation.....	12
2.7 Summary of literature Review and Knowledge Gaps.....	12
2.8 Conceptual Framework.....	15
CHAPTER THREE: RESEARCH METHODOLOGY	16
3.1 Introduction.....	16
3.2 Research Design.....	16
3.3 Population of the Study.....	16
3.4 Data Collection	16
3.5 Data Analysis	17
CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND	
INTERPRETATION	19
4.1 Introduction.....	19
4.2 Response Rate.....	19
4.3 Demographic Information.....	20
4.3.1 Gender of Respondents	20
4.3.2 Age Bracket Respondents	21
4.3.3 Level of Education.....	21
4.3.4 Job Position Held.....	22
4.3.5 Work Experience	23
4.3.6 Size of the Firm.....	23
4.3.7 Years of Operation.....	24
4.4 Extent of E-Procurement Implementation by Pharmaceutical Firms.	25
4.5 Extent to which E-Procurement practices affect Operational Performance of Pharmaceutical Firms.....	26
4.6 Relationship between E-Procurement and Firm Operational Performance	27
4.6.1 Regression Coefficients	27
4.6.2 Model Summary.....	29
4.6.3 Analysis of Variance.....	30
4.7 Challenges Faced by Pharmaceutical Firms in Kenya when implementing E- procurement	31
CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS	33

5.1 Introduction.....	33
5.2 Summary of Findings.....	33
5.3 Conclusion	33
5.4 Recommendations.....	34
5.5 Limitations of the Study.....	34
5.6 Areas for Further Research	35
REFERENCES.....	36
APPENDICES.....	40
Appendix I: Research Questionnaire	40
Appendix II: List of Pharmaceutical Firms in Nairobi.....	45
Appendix III: E-Procurement Practices and Operational Performance.....	45

ABBREVIATIONS AND ACRONYMS

DOI	Diffusion of Innovation
HIS	Hospital Information Systems
ICT	Information and Communication Technologies
IEBC	Electoral and Boundaries Commission
KEMSA	Kenya Medical Suppliers Authority
MEDS	Mission for Essential Drugs and Supplies
MMIS	Materials Management Information Systems
NSSF	National Social Security Fund
PIS	Pharmacy Information System
TAM	Technology Acceptance Model
TOE	Technology Organization Environment

LIST OF TABLES

Table 4. 1 Response rate	19
Table 4. 2 Gender.....	20
Table 4. 3 Age Bracket of Respondents.....	21
Table 4. 4 Level of education	22
Table 4. 5 Job Position Held	22
Table 4. 6 Work Experience	23
Table 4. 7 Size of the firm	24
Table 4. 8 Years of Operation.....	24
Table 4. 9 E-Procurement Practices	25
Table 4. 10 Operational performance	27
Table 4. 11 Regression Coefficients	28
Table 4. 12 Model Summary	29
Table 4. 13 Analysis of Variance (ANOVA).....	30
Table 4. 14 Challenges of E-Procurement	31

LIST OF FIGURES

Figure 2.1 Conceptual Framework	15
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CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

In advancing business performance currently, e-procurement is a vital tool though it has not been incorporated adequately in majority of businesses, especially small and medium enterprises. According to Gunasekaran and Ngai (2008), insufficient and unsustainable procurement procedures have led to dismal performance in terms of business growth and profit making by many firms in Kenya and the world over. Main government projects in Kenya such as Standard Gauge Railway, independent Electoral and Boundaries Commission (IEBC) Biometric voter register/ voter identification kit and the National Social Security Fund (NSSF) funded Tassia II estate project, have all been in the limelight. In all these instances the procurement process was masked in corruption, undercutting, secrecy and incompetence which will result or resulted in enormous amounts of capitals going to waste (Gichio, 2014).

Chaffey (2004) suggested that reduced purchasing cycle time and costs, elimination of managerial faults, increased buyers' efficiency, enhanced budgetary controls, low charges as a result of product regulation and merging of buys, improved payment process and improved information management are encouraged by e-procurement. Kumar and Srinivasan (2013), in their study established that, performance in the Shipping management Business in India is improved by implementation of electronic procurement.

1.1.1 E-Procurement

Procurement is the process of gaining by purchasing, franchise, tenancy, rental, license, lease, hire, or by other contractual means of any type of works, service or goods, assets, including livestock or any combination and includes planning, advisory and processing in the supply chain system (Public Procurement and Asset Disposal, 2015). E-procurement on the other hand, uses information technology in managing the procurement process in the organization with an aim of improving the entire procurement process. Croom and Brandon-Jones (2004) explain e-procurement as government-to-business, business-to-

business or business-to-consumer or purchase and sale of supplies, work, and services through networking and internet systems.

Public procurement has considered e-procurement as one of the major reforms. E-procurement offers many benefits hence the concept is accepted by factually all businesses and many kinds of firms. E-Procurement implementation in firms requires resources and specialized skills, training program and well-coordinated change management systems (Garran, 2005). Other factors such as good governance and firm's capacity developments are also critical for e-procurement implementation (United Nations, 2011).

According to Nzuve (2013), e-procurement adoption by the health sector comes with many benefits. For instance, pharmaceutical firms will be able to do away with problems such as compound products handling activities, unnecessary inventory, paper shuffling, data and process quality issues, carrying costs, poorly developed links to suppliers and lengthy order cycle times.

1.1.2 Operational Performance

Operational performance is the extent to which the organization is able to meet its own needs and the needs of its stakeholders for survival (Griffin, 2003). Operational performance is characterized by four performance dimensions. These include: cost/productivity, time/speed, operations flexibility and quality (De Toni & Tonchia, 2001). To achieve operational performance, firms must consider all resources at its disposal for instance through employees, the organization must consider them as assets and they must be treated with great attention so that the employees become motivated and productive. Operational performance measures include; - customary separate performance measures such as; performance to schedule, preventive maintenance, productivity measures, lead-time measures, quality measures, inventory measures and utilization (Birech, 2011).

The main objectives of performance measurement are to increase efficiency and effectiveness hence improving the ability of the firm to deliver goods or services and

retain customer satisfaction (Kaplan & Norton, 2001). According to Gompers, Ishii and Metrick (2003), operational performance is important to an organization because an organization's ability to perform financially is critical thus must be monitored both in the short and in the long run. Performance is a concept that is context-based and does not have a single means of measurement. Due to this, there is no common measure of financial performance. A thorough valuation of a firm's performance should consider diverse procedures.

1.1.3 Pharmaceutical Manufacturers in Kenya

In the Common Market for Eastern and Southern Africa (COMESA) region, Kenya is presently the leading producer of pharmaceutical products (Kenya Pharm Expo, 2016). This is through supplying pharmaceutical products to about 50% of the regions' market. Approximately 30 of the 50 recognized pharmaceutical manufacturers in the region are based in Kenya (Kenya Pharm Expo, 2016). There are roughly 9,000 pharmaceutical products registered for sale in Kenya (Kenya National Bureau of Statistics (2012). These are classified according to levels of channel of dispensing, for example; over the counter, pharmacist dispensable or only by prescription.

There are three segments of pharmaceutical industry, namely the manufacturers, distributors and retailers. An estimated of about 4,557 health facilities countrywide are supported majorly by the three segments (Kenya National Bureau of Statistics, 2012). The sector has about 30 licensed concerns include subsidiaries or joint ventures, local manufacturing companies and large Multi-National Corporations (MNCs). Nairobi and the surrounding have majority Pharmaceutical firms. Collectively, these firms employ about 65% which is over 2,000 people, of who work in direct production.

1.2 Research Problem

Aberdeen Group (2001) stated that e-procurement is one of the most effective aspect of electronic commerce. E-procurement is said to be cost saving and improve efficiency (Kalakota & Robinson, 2000). Most African countries tackle the challenges of absence of liability and transparency in public acquisition by legal reforms and adopting e-

procurement. According to Sijaona (2010), Tanzania has enabled e-sharing, e-advertisement, e-submission, e-evaluation, e-contacting, e-payment, e-communication and e-checking and monitoring by putting in place e-procurement systems.

Studies done in this area of knowledge include; Tanner, Wolfle, Schubert and Quade (2007) who studied the current trends and challenges in e-procurement among large Swiss companies and established that over 70 % of the Swiss companies has electronic exchange of invoices (e-invoicing) as a current key topic. Steinberg's (2003) researched on the implementation of e-procurement in state corporations in Britain and established that although its implementation is being encouraged by public sector agencies, its success is little.

Nzuve (2013), in her study on e-procurement practices implementation by private hospitals in Nairobi, established that factors such as risk perception had a negative relationship, while existing technology, top management support and implementation strategy had a positive relationship to e-procurement implementation. Oyamo and Mburu (2014) researched on the effects of procurement processes on distribution of pharmaceutical drugs and established that contracting contributed most to the distribution of pharmaceutical drugs followed by specification design then procurement planning.

Most of the studies reviewed in this area focused on e-procurement and supply chain performance of state corporations and thus did not review the relationship between e-procurement and performance of pharmaceutical firms. Nzuve (2013), Oyamo and Mburu (2014) who came close to tackling this topic did not cover performance of pharmaceutical firms in Kenya. It is against this background, this study sought to establish; the relationship between e-procurement and firm performance of pharmaceutical firms in Nairobi, Kenya.

1.3 Research Objectives

The study sought to examine the relationship between e-procurement and firm performance of pharmaceutical firms in Nairobi, Kenya

1.1.3 Specific Objectives

- i. To establish the extent of e-procurement implementation by pharmaceutical firms in Nairobi, Kenya.
- ii. To determine the relationship between e-procurement and firm performance of pharmaceutical firms in Nairobi, Kenya
- iii. To find out the challenges faced by pharmaceutical firms in Nairobi, Kenya when implementing e-procurement.

1.4 Value of the Study

The study findings will be of value to different parties: regulators and policy makers, pharmaceutical firms, researchers and academicians.

To the strategy creators, the findings of the study will be useful to the Government and other regulators in regard to advising and formulation of guidelines towards putting into place the right procedures that govern e-procurement in pharmaceutical firms.

This study will be of importance to pharmaceutical firms and other organizations that participate in e-procurement since it will enable them to understand how they can improve their performance which will foster good e-procurement practices.

To other researchers and academicians, the study will add to the growing literature on e-procurement and performance in pharmaceutical firms in Nairobi, Kenya. The study will also form a source for future research on e-procurement and firm performance in pharmaceutical firms in Nairobi, Kenya. The study will be of significance to the existing theory by either supporting or challenging through research findings.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The chapter presents theories associated to this study, e-procurement implementation and firm performance, the challenges of e-procurement implementation, conceptual framework and the summary of literature review and knowledge gaps.

2.2 Theoretical Literature Review

This study was based on three theories. These are: Diffusion of innovation (DOI) Technology Acceptance model (TAM), and Technology Organization environment (TOE) Theory. These theories were chosen because they are the most relevant for this study.

2.2.1 Technology Acceptance Model

According to Davis (1985), user motivation can explain or predict system use response, which is openly subjective by an exterior incentive consisting of the real system's structures. Alleged Ease of use, alleged efficacy and assertiveness toward using the system are multiple elements user motivation can be explained by. With alleged ease of use having a direct influence on alleged usefulness are the two major beliefs the attitude of the user is considered to be influenced by (Chuttur, 2009).

TAM is criticized on its restricted expounding and projecting power, questionable heuristic value, insignificance, and lack of any realistic value (Chuttur, 2009). According to Benbasat & Barki, (2007), TAM is criticized for diverting researchers' interest from other significant study issues. It has created fantasy of evolution in information accretion since it recommended that user motivation is a response that is explained or predicted by system use. This study will investigate whether E-procurement adoption and well-functioning can be explained by the firm performance among pharmaceutical firms.

2.2.2 Technology Organization Environment

Tornatzky and Fleischer (1990) explain that, Organization Environment framework theory comprises of multiple input determinants that organizational adoption is affected by. These include: technology, organization, and the environment. They explain that technological situation relay to the technologies presented to a firm; the organizational situation shows the uniqueness of an organization which includes the sum of relaxed capital available within, firm size, formalization, the intricacy of its administrative configuration, and degree of centralization.

According to De-Pietro *et al.*, (1990) external environment are factors that give chances for technological innovations and constraints outside an organization. Zhu, Kraemer and Xu, (2003) prefer TOE to other theories. TOE theory deals with the environment factors that affect organizations when adopting technologies, thus this theory will help in the explanation of challenges faced by pharmaceutical firms in Nairobi, Kenya when implementing e-procurement.

2.2.3 Innovation Diffusion Theory

Innovation Diffusion Theory (IDT) also identified as Diffusion of Innovation Theory (DOI) was developed by Rogers (1995), and has since been used widely to predict innovation adoption behavior at the individual and organization level (Masrom & Hussein, 2008). Rogers (1995), brings out the various innovation uniqueness that control the approval rate of innovation. They include; relative advantage, compatibility, complexity, trialability and observability.

Compatibility is the degree to which an innovation is alleged as being steady with the values, needs of possible adopters and past experiences. The degree to which an innovation is alleged as difficult to use and understand is complexity. Trial-ability is the degree to which an innovation can be experimented with, on a limited basis. This theory will help explain the extent of the E-procurement acceptance amongst pharmaceuticals firms in Nairobi, Kenya and how it has contributed to their performance.

2.2.4 Conclusion on the Theoretical Literature Review

TAM theory is preferred because the theory contains conserved and brilliant relevance in technology acceptance research whether the focus has been on innovation, e-business or new technological application. TAM theory stress on decision maker attitude and intentions to use e-procurement and also offer low level outcome that can be used in user acceptance study.

2.3 E-procurement Implementation

The various forms through which e-Procurement can be implemented include procurement stages such as; e-sourcing, e-tendering, e-auction/reverse, e-order processing and e-communication. These are discussed in this section.

2.3.1 E-Sourcing

Identifying new suppliers for a detailed type of purchasing necessities using internet is e-sourcing. 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.

2.3.2 E-Tendering

E-tendering involves use of internet to send requirements for specifications and prices to and receive responses to and from suppliers. Shalle (2014) asserts that the process of carrying out entire online cycle of price bid submission such that efficiency, economy, the speed of the internet is achieved can be connect to e-tendering. E-tendering substitutes manual paper-based tender processes to save time and money.

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

2.3.3 E- Auctioning

E- Auctioning involves the use internet expertise to purchase goods and services from a various known or unknown suppliers (Swenseth *et al.*, 2009). To unite with a broad range of service givers, many enterprises prefer using the internet rather than traditional channels as this would be practical in the real world (Mabert *et al.*, 2002).

Traditional auctions vary from online in that several suppliers, in the region of ten or more (Emiliani, 2000) but as little as three, are sourced to take part in the online auction in which they can offer various bids while contending for bid prices are open to all parties. Unlike conventional, fixed bidding which can vary from weeks to several months (Emiliani, 2000), e-auctions classically last for half hour.

2.3.4 E-Order Processing

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.

2.3.5 E-Communication

Although various researchers' points communication as crucial to the accomplishment of firms, it has been taken seriously (Scholes, 2006). Appropriate communication using superior technological systems across organizational departments is imperative for firms realizing elevated height of client service and universal presentation.

Communication is exceedingly vital for any firm external and internal relations. Information technology use offer effectual communication practice that is effective and

reliable. Effective communication enables helpful conversation with customers, increasing customers' level of trust. (Nickels *et al.*, 2002).

2.4 E-procurement Implementation and Operational Performance

E-procurement has a strategic significance entity as its implementation traverse many institutional hurdles and public managers' paradigms. E-procurement conveys dynamics and latest regulations creating conduct of carrying out trade with the public in entirely diverse way. It has situations with the possibility of generating a competitive marketplace of matchless simplicity, access and efficiency (Adero, 2014).

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 Empirical Literature Review

Tanner, Wolfle, Schubert and Quade (2007) examined the current trends and challenges in electronic procurement among large Swiss companies. The study established that electronically, orders and invoices are the most often business documents that are exchanged between partners. The study also established that over 70 % of the companies electronic exchange of invoices (e-invoicing) is a current key topic. The study thus concluded that expectations of IT are rarely completely fulfilled though it plays a major task in daily procurement.

Calipinar and Soysal (2012) analyzed e-Procurement in the health sector in Turkey. The researchers established that with little time and financial investment, saving considerable time and money can be ensured by using the proposed advice given to pharmacies working in hospitals. The study concluded that the general picture for e-procurement in developing countries can be seen by academics and practitioners with e-procurement adoption by pharmacies located in Turkey.

Kumar and Srinivasan (2013) analyzed the implementation and performance effect of electronic procurement on ship management companies in India. The study adopted a descriptive research design. The study determined that e-procurement increases performance and it can be utilized as a favorable tool, particularly economic crises during in shipping by corporations.

Locally, Mose, Njihia and Magutu (2013) studied large-scale manufacturing firms in Nairobi, critical success factors and challenges when implementing e-procurement. The study established that e-procurement practices have been accepted by many large scale manufacturers in Nairobi, Kenya. These include: publication of tenders, submission and receiving applications and shortlisting suppliers online.

Kamotho (2014) analyzed relationship between e-procurement practices and performance among state corporations. The study established that state corporations have adopted various e-procurement practices that had had a significant impact on their procurement. The researcher recommended that; the national government should address the various challenges that are faced by state corporations.

Ngeno and Omwenga (2015) examined the factors contributing to the adoption of E-Procurement in Bomet County Government. The researchers established that e-procurement is the preferred way of procurement with 76% of the respondents supporting while 24% preferred the manual way. The researchers also established that organizational culture, environment and technology greatly influence the adoption of the e-procurement system. The study recommended that the county governments should do more on equipping staff in terms of ICT. The study, however, was not based on pharmaceutical firms in Nairobi.

2.6 Challenges of 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. Min and Galle (2003) assert 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 that managers' and opinions that the Internet would not lead to more efficiency or lower 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, a interrupted power supply, e-procurement software, adequate servers and backups. There is a relationship between supportive technological infrastructure and the application of e-procurement in the organization (Kalakota *et al.*, 2006).

2.7 Summary of literature Review and Knowledge Gaps

Table 2.1: Summary and Knowledge Gaps

Author(s)	Focus of the Study	Methodology	Major findings	Knowledge gaps
Tanner, Wolfe, Schubert and Quade	The current trends and challenges in electronic procurement	A case study analysis.	The study established that electronically, orders and invoices are the most often business documents that are exchanged	The study did not review e-procurement among

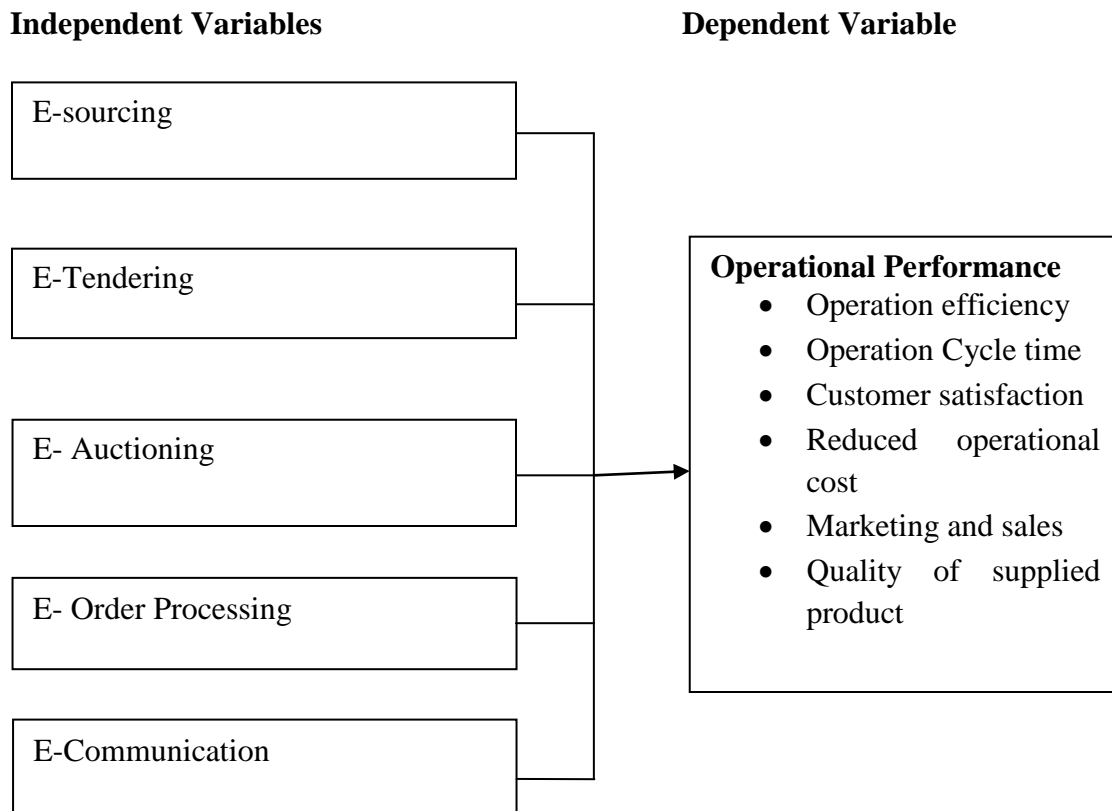
(2007)	among large Swiss companies		between partners and that over 70 % of the companies electronic exchange of invoices (e-invoicing) is a current key topic	pharmaceutical firms
Calipinar and Soysal (2012)	E-Procurement in the health sector in Turkey	A case study strategy	Activities in pharmacies and drug flow from doctor to patient can be improved by use of technology from the perspective of e-procurement.	The study was Turkey based thus could not represent Kenyan pharmaceutical firms
Kumar and Srinivasan (2013)	The implementation and performance effect of electronic procurement on ship management companies in India	A case study of Indian companies.	They established existence of a relationship between managerial and systematic problems with lack of performance improvement non with electronic procurement system	The study was India based thus could not represent e-procurement in Kenya.
Magutu, Njihia and Mose (2013)	Large-scale manufacturing firms in Nairobi ,critical success factors and challenges when implementing e-procurement	A case study analysis.	Established that the major challenges facing adoption of e-procurement were; employees' resisting change, management not supporting the e-procurement practices and company board not approving e-procurement practices.	The study was not based on pharmaceutical firms in Nairobi.
Kamotho (2014)	E-procurement practices and performance among state corporations	A case study analysis of state corporations	Established that state corporations have adopted various e-procurement procurement practices that had had a significant impact on their procurement.	Relationship between e-procurement and firm performance were not assessed in the study
Ngeno and Omwenga (2015)	The factors contributing to the adoption of E-	A case study analysis of County	The researchers established that e-procurement is the preferred way of procurement with 76% of the	The study did not examine firm

	Procurement in Bomet County Government.	Bomet County Government	respondents supporting while 24% preferred the manual way.	performance among pharmaceutical firms in Nairobi, Kenya.
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2.8 Conceptual Framework

For this study, the independent variables are e-procurement practices which are, e-sourcing, e-tendering, e-auctioning, e-order processing and e-informing (communication) while the dependent variable is firm performance.

Figure 1 Conceptual Framework



Source: Researcher (2016)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter summarizes the research methodology used in the research study. The aspects discussed in this study include: the research design, population of the study, data collection methods and data analysis as well as findings presentation method.

3.2 Research Design

Descriptive research design was used in this study since it enabled the researcher to seek new ideas from the respondents and develop an insight to the problems under study since it enables respondents to give more information freely. The descriptive research design was suitable for the need to describe the correlation amongst e-procurement and operational performance of pharmaceutical firms in Nairobi.

3.3 Population of the Study

All pharmaceutical firms operating in Nairobi were the target population for this study. According to the Kenya Medical Supplies Authority (2015), there were a total of 50 pharmaceutical firms in operating in Nairobi. (Appendix II). This study was a census survey since the population is small.

3.4 Data Collection

Primary data collected using self-administered questionnaires was used for the study. The “drop-and-pick-up later” method was used to administer the questionnaires. The respondents of the study were the supply chain/ operation/ logistics/ procurement managers (or their equivalent) of the pharmaceutical firms based in Nairobi County as per the firm management structure.

The questionnaire was structured into four sections. Section A contained general information questions; Section B comprised questions on the extent of e-procurement implementation by pharmaceutical firms in Nairobi, Kenya; Section C had relationship between e-procurement and firm performance questions on the performance of

pharmaceutical firms in Kenya while section D contained questions on the challenges faced by pharmaceutical firms in Kenya when implementing e-procurement.

3.5 Data Analysis

The questionnaires collected were corrected and prepared for totality in planning for coding. After coding, they were entered into the Statistical Package for Social Sciences (SPSS) version 22 for analysis. Each objective of the study was analyzed using descriptive statistics and occurrence distribution such as the extent of e-procurement implementation, the performance of pharmaceutical firms and challenges faced when implementing e-procurement. For data presentation, frequency tables were used. Regression analysis was used to determine the relationship between e-procurement and firm performance of pharmaceutical firms in Nairobi, Kenya. The variables measured on the nominal scale were quantified using a dummy variable for purposes of attaining a higher level of analysis.

Table 3.1: Summary of Data Collection and Analysis methods

Objective	Questionnaire	Data Analysis
General Information	Section A	Descriptive Statistics
E-Procurement Implementation	Section B	Descriptive Statistics
Relationship between Variables	Section C	Regression Analysis
Challenges of E-Procurement Implementation	Section D	Descriptive Statistics

Source: Researcher (2016).

The following multivariate regression model was used, to define the relationship between e-procurement and operational firm performance of pharmaceutical firms in Nairobi, Kenya;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon$$

Where:

Y – Firm Performance (Dependent variable)

X_1 - X_5 – The independent variables

X_1 - E-Sourcing

X_2 - E-Tendering

X_3 - E- Auctioning

X_4 - E- Order Processing

X_5 - E-Communication

β_0 - Is the constant of the model

β_1 - β_5 – Are the regression coefficients

ε – Stochastic error term estimate

CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter presents the analysis, presentation and explanation of data collected from the semi-administered surveys. The collected questionnaires were checked for consistency before being coded and entered into SPSS (version 22). Descriptive statistics such as frequency distribution and percentages were used to analyze general information. Means was used to analyze e-procurement practices, operational performance and challenges of e-procurement. Regression analysis was used to explain the relationship between e-procurement and operational performance of Pharmaceutical firms in Nairobi. The findings are presented in form of tables.

4.2 Response Rate

50 semi-structured questionnaires were administered to pharmaceutical firms in Nairobi. The study managed to receive a total of 40 duly filled questionnaires which constituted a response rate of 80%. According to Edwards, Clarke and Kwan (2002), a response rate of 80% and above is considered adequate. This implies that response rate for this study was adequate to enable the researcher to perform the analysis.

Table 4. 1 Response rate

Response Rate	Frequency	Percentage
Responded	40	80
Not responded	10	20
Total	50	100

Source: Research Data (2016)

4.3 Demographic Information

The respondents were asked to provide general information in regard to Gender, Age Bracket, Highest level of education, job position held, duration in that position, size of the pharmaceutical firm and the number of years the firm has been in operation.

4.3.1 Gender of Respondents

The study sought to identify the gender of the respondents that took part in the research

Table 4. 2 Gender

Gender	Frequency	Percent
Male	23	57.5
Female	17	42.5
Total	40	100.0

Source: Researcher (2016).

Table 4.2 reports that 57.5% (23) of the respondents were male while 42.5% (17) were female. This implies that gender parity was achieved in this study.

4.3.2 Age Bracket Respondents

The respondents were requested to indicate the age brackets they fitted into. Their responses were obtained and analyzed as tabulated in Table 4.3.

Table 4. 3 Age Bracket of Respondents

Age Bracket	Frequency	Percent
31-35 years	13	32.5
26-30 years	12	30.0
41-50 years	8	20.0
36-40 years	4	10.0
20-25 years	3	7.5
Total	40	100.0

Source: Research Data (2016)

The study found that respondents aged between 31-35 years were (32.5%) ,followed by those aged between 26-30 years at 30% and then those aged between 41-50 years at 20%. Those in the age bracket of 20-25 recorded the least percentage of 7.5%. This implies that the pharmaceutical firms have mostly employed relatively young people who are tech-savvy and might influence adoption of technology in procurement. Scholes (2006) asserts that older respondents have a better understanding of e-procurement practices compared to young respondents. Moreover, age also reflects the level of expertise in the field of study.

4.3.3 Level of Education

On the education level of respondents from pharmaceutical firms, the responses obtained were analyzed as depicted in table 4.4.

Table 4. 4 Level of education

Level of Education	Frequency	Percentage
Post graduate	14	35.0
Undergraduate	14	35.0
College level	12	30.0
Total	40	100.0

Source: Research Data (2016)

The findings indicated that most of the respondents had attained higher levels of education such as post graduate level and graduate at 35% (14) each. College respondent accounted for 30% (12). This implies that most of the respondents were well educated to read the questionnaires and respond to the questionnaires appropriately. Edwards, Clarke and Kwan (2002) point out that the more knowledgeable respondents are, the better their understanding is concerning the topic of study.

4.3.4 Job Position Held

In this section, the respondents were requested to specify their job designations. Table 4.5 shows the findings of the study.

Table 4. 5 Job Position Held

Job title	Frequency	Percent
Procurement manager	15	37.5
Assistant procurement manager	10	25.0
Operations manager	8	20.0
Director procurement	4	10.0
Procurement Officers	3	7.5
Total	40	100.0

Source: Research Data (2016)

The respondents were also asked the position they hold in their respective pharmaceutical firms. The results indicate that 37.5% (15) of the respondents were procurement managers. 25% (10) were assistant procurement managers while 20% (8) were operations

managers and 10% (4) were directors of procurement respectively. The remaining 7.5% (3) are Procurement Officers. This shows that the respondents were in job positions that skilled then to understand the use of technology in procurement in pharmaceutical firms. In addition, Mabert *et al.* (2002) suggest that having respondents with relevant job positions helps to improve the findings collected.

4.3.5 Work Experience

The study sought to make out the duration of time the respondents had been holding their job positions. The study findings are as shown in Table 4.6

Table 4. 6 Work Experience

Years	Frequency	Percent
1-5 Years	21	52.5
6-10 Years	12	30.0
Above 10 Years	4	10.0
Less than 1 Year	3	7.5
Total	40	100.0

Source: Research Data (2016)

The study results shown that majority (52.5%) of the respondents had been serving in their current job position for 1-5 years followed by those who served for 6-10 years at 30%. Only 7.5% of the respondents had a working experience of less than 1 year. This is an indication that most of the respondents have worked long enough in pharmaceutical firms to witness changes in procurement including the adoption of E-procurement and how it impacts the firms' performance. Kumar and Srinivasan (2013) also suggest that respondents with a longer working experience are more knowledgeable on the topic of study.

4.3.6 Size of the Firm

The study further requested the respondents to indicate the size of their firms by virtue of the number of employees. Table 4.7 shows the findings the study.

Table 4. 7 Size of the firm

Number of employees	Frequency	Percentage
Above 100	32	80
71-100	16	10
51-70	2	5
21-50	1	2.5
0-20	1	2.5
Total	40	100

Source: Research Data (2016).

The study results shown that majority (80%) of the pharmaceutical firms had above 100 employees followed by the firms with 71-100 employees. The firm with 51-70 employees had 5%, while the ones with 21-50 and 0-20 employees were the least at 2.5% each. This indicates that the pharmaceutical firms from whom the data was collected were large enough to embrace the use of technology. According to Plant and Valle (2008), many large firms as indicated by a bigger number of employees have a better experience with e-procurement practices and as such are suitable for a study.

4.3.7 Years of Operation

The study lastly sought to establish the number of years the pharmaceutical firms had been in operation. Table 4.8 summarizes the results of analysis of the collected data.

Table 4. 8 Years of Operation

Working experience	Frequency	Percent
10-20years	18	45.0
Above 20 years	16	40.0
6-10 years	4	10.0
1-5 years	2	5.0
Total	40	100.0

Source: Research Data (2016)

45% (18) of pharmaceutical firms had been in operation between 10 and 20 years. 40 % firms had above 20 years of operation, while 10% (4) had existed between 6-10 years year. The remaining 5% (2) had been in operation for between 1 to 5 years. This clearly shows that the respondents are knowledgeable in their areas of expertise. According to Plant and Valle (2008), experienced firms are indicated by a longer duration of existence.

4.4 Extent of E-Procurement Implementation by Pharmaceutical Firms.

In order to establish the extent of e-procurement implementation by pharmaceutical firms in Kenya, the respondents were requested to rate the extent to which their pharmaceutical firms have implemented various E-Procurement Practices during their existence. The responses obtained were analyzed using means. The Table 4.9 illustrates the results.

Table 4. 9 E-Procurement Practices

E-Procurement Practice	Aggregate Mean
E-Communication	3.71
E-Tendering	3.60
E-Sourcing	3.39
E-Order processing	3.11
E-Auctioning	2.86

Source: Research Data (2016)

The study established that E-Communication was the most implemented e-procurement practices with an aggregate mean of 3.71. This indicates it was implemented to a great extent. According to Nickels et al. (2002), a high level of trust with customers is developed through effective communication. Scholes (2006) on the other hand points out that communication is crucial to the success of organizations.

E-Tendering was implemented to a great extent as evidenced by an aggregate mean of 3.60. According to Shalle (2014) e-tendering is a process of carrying out the entire cycle online including submission of price bid such that efficiency, economy, the speed of the internet can be coupled.

The pharmaceutical firms do e-Sourcing to a moderate extent as indicated by a mean score of 3.39. Shalle (2014) asserts that the major value of e-sourcing is the competitive trait by which suppliers bid for tasks.

E-Order Processing by pharmaceutical firms is done to a moderate extent as indicated by an aggregate mean score of 3.11. According to Ingram (2016), since automated systems can help reduce errors in order processing, electronic Order Processing ensures that all the customers' orders are filled on time.

The pharmaceutical firms do E- Auctioning to a moderate extent (Mean=3.39). Mabert *et al.* (2002) observe that various firms opt to use internet to connect with a broad range of service givers than would be manually.

4.5 Extent to which E-Procurement practices affect Operational Performance of Pharmaceutical Firms

The study in this section, sought to establish the extent to which e-procurement practices affects the operational performance of pharmaceutical firms in Nairobi, Kenya. The operational performance of pharmaceutical firms was measured using performance metrics such as operation efficiency, vendor-buyer relationship, errors in order transmission, operational cost, resource utilization, procurement process time and quality of supplied product. Analysis of the data was done using means. In order to determine the extent to which e-procurement influences the operational performance of the pharmaceutical firms, composite scores were computed for each e-procurement practice. The study results are as revealed in Table 4.10

Table 4. 10 Operational performance

Practices	Mean
E-Communication	4.15
E-Order Processing	4.10
E-Sourcing	4.01
E-Tendering	3.88
E-Auctioning	3.56
Aggregate	3.94

Source: Research Data (2016)

The study established that all the e-procurement practices influence the operational performance of pharmaceutical firms to a great extent. E-Communication had the greatest effect on operational performance as evidenced by a mean of (M= 4.15) followed by E-Order Processing with a mean of (M= 4.10) and then E-Sourcing with a mean of (M= 4.01), E-Tendering with a mean of (M= 3.88). E-Auctioning was found to have the least effect as shown by a mean of (M= 3.56). According to Plant and Valle (2008), automating processes which are currently manual-based reduces transaction costs, streamline and standardize processes and documentation. Implementing e- procurement has significant financial benefits.

4.6 Relationship between E-Procurement and Firm Operational Performance

Regression analysis was used to explain the relationship between e-procurement practices and operational performance in the pharmaceutical firms in Nairobi. The variables which were measured on a nominal scale were quantified using a dummy variable to obtain scores for regression analysis. The results obtained are as discussed below.

4.6.1 Regression Coefficients

Table 4.11 gives a summary of the regression coefficients at $\alpha=5\%$. The researcher revealed that e-procurement practices have a combined positive effect on the firms' operational performance among pharmaceutical firms in Nairobi as indicated by positive

regression coefficients for all independent variables (e-communication, e- auctioning, e- sourcing, and e-tendering and e-order processing).

Table 4. 11 Regression Coefficients

Model	Unstandardized		Standardized	t	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	0.111	.681		5.245	.000
E-Sourcing	.162	.237	.121	3.683	.001
E-Tendering	.025	.225	.022	3.112	.002
E- Auctioning	.351	.243	.348	2.444	.016
E-Order Processing	.542	.145	.489	3.744	.003
E-Communication	.035	.068	.051	2.513	.018

a. Dependent Variable: Operational Performance

Source: Research Data (2016)

The study established that E-Sourcing (t=3.683, p= 0.001), E-Tendering (t=3.112, p= 0.002), E- Auctioning (t=2.444, p= 0.016), E-Order Processing (t=3.744, p= 0.003), and E-Communication (t=2.513, p= 0.018) produced statistically significant values for this study with (t critical =1.96, $p \leq 0.05$)

The constant value of 0.111 shows that if e-communication, e- auctioning, e-sourcing, e-tendering and e-order processing were rated zero, the operational performance of the pharmaceutical firms would be 0.111. The equation was expressed as:

$$Y = 0.111 + 0.162X_1 + 0.025X_2 + 0.351X_3 + 0.542X_4 + 0.035X_5$$

Where:

Y – Firm Performance (Dependent variable)

X₁- X₅ – The independent variables

X₁- E-Sourcing

X₂- E-Tendering

X₃- E- Auctioning

X₄- E- Order Processing

X₅- E-Communication

From the equation, $\beta_1 = 0.162$ means that a unit increase in the implementation of e-sourcing will increase operational performance by 0.162 units. A coefficient value of $\beta_2 = 0.025$ implies that a unit increase in e-tendering will increase operational performance by 0.025. In addition, a unit increase in e-auctioning increases operational performance by 0.351 units as implied by a coefficient $\beta_3 = 0.351$. A coefficient value $\beta_4 = 0.542$ indicates that a unit increase in e-order processing increases operational performance by 0.542 units. Finally, a unit increase in e-communication increases operational performance by 0.035 as indicated by a coefficient value of $\beta_5 = 0.035$. The positive effect that e-procurement practices have on the operational performance identified by this study is in agreement with the outcomes of Mose, Njihia and Magutu (2013) who also found that e-procurement practices have a positive effect on the operational performance.

4.6.2 Model Summary

Table 4. 12 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.853 ^a	.727	.687	.23557

a. Predictors: (Constant), E-Communication , E- Auctioning , E-Sourcing , E-Tendering , E-Order Processing

Source: Research Data (2016)

E-procurement practices considered in the analysis were e-communication, e- auctioning, e-sourcing, e- tendering and e-order processing. The study established that there was a strong relationship of 72.7% ($R^2 = 0.727$) between e-procurement and operational

performance of the pharmaceutical firms in Nairobi, Kenya. The remaining 27.3% may be as a result of other factors that contribute to e-procurement other than the ones stated in this model. These results are also consistent with Adero (2014), who established an R^2 value of 83.4%.

4.6.3 Analysis of Variance

Analysis of Variance (ANOVA) was done to verify the goodness of fit of the regression model.

Table 4. 13 Analysis of Variance (ANOVA)

ANOVA ^b						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.035	5	1.006	18.136	.000 ^b
	Residual	1.887	34	.055		
	Total	6.919	39			

a. Predictors: (Constant), E-Communication , E- Auctioning , E-Sourcing , E-Tendering , E-Order Processing

b. Dependent Variable: Operational Performance

Source: Research Data (2016)

The regression model recorded a significance p value of 0.000. This implies that the model had the goodness of fit and was ideal for determining how e-procurement practices implementation affects the operational performance of pharmaceutical firms in Nairobi, Kenya. This is because the regression model had a significance value (p-value) of less than 5% and an F value (18.136) is greater than the F-Critical Value (2.493). This result was consistent with Shalle (2014), whose regression equation was also a good fit.

4.7 Challenges Faced by Pharmaceutical Firms in Kenya when implementing E-procurement

Through this section, the study aimed to ascertain challenges faced by pharmaceutical firms in Nairobi, Kenya when implementing e-procurement. The respondents were asked to rate the extent to which their firms faced challenges when implementing e-procurement practices. Table 4.7 shows the results of the study.

Table 4. 14 Challenges of E-Procurement

Challenges	Mean
High costs of implementing e-procurement	3.35
High cost of training staff	3.13
Poor e-Procurement implementation strategy	2.80
Resistance to change by staff	2.78
Inadequate technological infrastructure	2.70
Systems integration problem	2.70
Lack of adequate systems security	2.58
Lack of a sound change management program	2.48
Lack of proper performance measurement systems	2.48
Non-supporting organizational culture	2.40
Poor Communication Mechanisms	2.20
Lack of supplier interest/support	2.10
Aggregate	2.64

Source: Research Data (2016)

The study established that challenges are faced to a moderate extent when implementing e-procurement as indicated by an aggregate mean of 2.64. The most faced challenge was the high costs of implementing e-procurement and the high cost of training staff with means of 3.35 and 3.13 followed by poor e-Procurement implementation strategy with a mean of 2.80. This indicates that these challenges were faced to a moderate extent. Poor Communication Mechanisms and lack of supplier interest/support were the least faced to a little extent as evidenced by means of 2.20 and 2.10 respectively. These findings differ

from those of Mose, Njihia and Magutu (2013) who established that the major challenges facing adoption of e-procurement were; employees' resisting change, management not supporting the e-procurement practices and company board not approving e-procurement practices.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the study, conclusions, recommendations, limitations of the study and suggestions for further study.

5.2 Summary of Findings

This study sought to establish the extent of e-procurement implementation by pharmaceutical firms in Nairobi, Kenya the challenges faced when implementing the e-procurement practices and the relationship between e-procurement and firm performance of pharmaceutical firms in Nairobi, Kenya. The study established that E-Communication and E-Tendering were implemented to a great extent hence being the most implemented e-procurement practices. The study also established that the pharmaceutical firms do E-Sourcing, E-Order Processing and E- Auctioning to a moderate extent. Further, the study also revealed that challenges are faced to a moderate extent when implementing e-procurement practices. On the relationship between e-procurement and firm performance of pharmaceutical firms in Nairobi, Kenya, the study established there was a strong relationship between e-procurement and operational performance of the pharmaceutical firms in Nairobi, Kenya. The study also established that 72.7% of e-procurement practices explain operational performance of pharmaceutical firms in Nairobi, Kenya.

5.3 Conclusion

On the extent of e-procurement practices implementation, the study concludes that E-Communication and E-Tendering are implemented to a great extent while E-Sourcing, E-Order Processing and E- Auctioning are implemented to a moderate extent. This means E-procurement practices improve on the operational performance of the firm. The positive effect that e-procurement has on operational performance is also statistically significant as indicated by their respective significant p values.

In regard to the challenges faced by pharmaceutical firms in Nairobi, Kenya when implementing e-procurement practices, the study concludes that challenges are faced to a moderate extent with the most faced challenges being the high costs of implementing e-

procurement and the high cost of training staff followed by poor e-Procurement implementation strategy.

5.4 Recommendations

The study wishes to make the following recommendations in order to improve the operational performance of pharmaceutical firms in Nairobi. The study established there being a strong and constructive affiliation connecting e-procurement and operational performance. These include; increased effectiveness and efficiency, improved the ability of a firm to deliver goods or services and retain customer satisfaction.

It should also be noted that e-Procurement implementation in firms requires resources and specialized skills. This study identified high costs of training staff as the greatest challenge faced during the implementation of e-procurement practices. Firms should, therefore, ensure that they have the necessary training requirements that will allow efficient and synchronize change controlling systems and teaching program

The study, therefore, recommends that the management of the pharmaceutical firms should implement in full the e-procurement practices as it will lead to improved operational performance.

5.5 Limitations of the Study

Some of the respondents were reluctant in filling the questionnaires in fear that the information sought would be used against them or their businesses. However, the researcher assured the respondents that information being collected is for academic purpose only and that it would be treated with utmost confidentiality.

Further, the respondents had busy working schedules in their pharmaceutical firms which derailed the process of data collection. The researcher tackled the limitations by emphasizing to the respondents that the data was needed urgently in order to meet the academic deadlines.

Lastly, the accuracy of the data collected was mainly dependent on what was provided by the respondents from the pharmaceutical firms. The researcher handled the limitation

from answering the respondents' queries on the questions that the respondents didn't understand.

5.6 Areas for Further Research

The study was confined to pharmaceutical firms operating in Nairobi, Kenya. A similar study should be done in non-pharmaceutical firms order to improve on the study findings and policy change recommendations arising from this study to facilitate the making of more an adequate conclusion.

This study was mainly concerned with establishing the impact of e-procurement implementation on operational performance of pharmaceutical firms in Nairobi, Kenya However; more studies can be conducted to establish the impact of e-procurement implementation on operational performance of other sectors such as the educational sector, or the retail industry.

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APPENDICES

Appendix I: Research Questionnaire

This questionnaire seeks to collect data on the effect of e-procurement on the performance of pharmaceutical firms in Kenya. Kindly fill in the questionnaire. Any information availed will be treated with utmost confidentiality and shall be used for academic purposes only. Your identity shall not be revealed.

SECTION A: GENERAL INFORMATION

1. Gender

Male Female

2. Age Bracket in years

20-25 26-30

31-35 36-40

41 -50 51 and Above

3. Highest level of education

O Level A Level

College Level Graduate Level

Post Graduate Level Any other (Specify)

4. What position do you hold in this organization?

a) Procurement Manager

b) Assistant Procurement Manager

c) Operations Manager

d) Others Positions (please specify).....

5. How long have you been in this position?

Less than 1 year 1 - 5 years

6 – 10 years Above 10 years

6. Size of the pharmaceutical firm

- 0-20 Employees []
- 21-50 Employees []
- 51-70 Employees []
- 71-100 Employees []
- Above 100 Employees []

7. Number of years the pharmaceutical firm has been operating in Kenya

- 1 - 5 Years []
- 5 – 10 Years []
- 10-20 Years []
- Above 20 years []

SECTION B: E-PROCUREMENT PRACTICES

10. To what extent has your firm implemented the following E-procurement Practices? Tick as appropriate using the following Likert scale of 1-5 where: 1= No Extent; 2= Little Extent; 3= Moderate Extent; 4= Great Extent; 5=Very Great Extent.

E-PROCUREMENT PRACTICES		Respondents				
		1	2	3	4	5
E-Sourcing						
1.	The firm identifies new suppliers through the internet					
2.	Suppliers submit bids along with various details over internet					
E-Tendering						
1	The firm sends requests for prices to suppliers online					
2	The firm receives responses from suppliers online					
E- Auctioning						
1	The firm buy goods/ services from a number of suppliers online					
2	Suppliers compete in real time for the buyer's product request					
E- Order Processing						
1.	The firm makes orders for supplies online					
2.	Suppliers receive and process client orders via internet					
E-Communication						

1	The firm distributes purchasing information online					
2	Suppliers respond to buyers information online					

SECTION C: OPERATIONAL PERFORMANCE

To what extent has **E-Sourcing** implementation affected firm performance? Tick as appropriate using the following Likert scale of 1-5 where: 1= No Extent; 2= Little Extent; 3= Moderate Extent; 4= Great Extent; 5=Very Great Extent.

Performance Measurement	Respondents Ratings				
	1	2	3	4	5
Improved operation efficiency					
Improved Vendor-Buyer relationship					
Better quality of supplied product					
Reduction in operational cost					
Improved resource utilization					
Reduction in procurement process time					
Reduction of errors in order transmission					

To what extent has **E-Tendering** implementation affected firm performance? Tick as appropriate using the following Likert scale of 1-5 where: 1= No Extent; 2= Little Extent; 3= Moderate Extent; 4= Great Extent; 5=Very Great Extent.

Performance Measurement	Respondents Ratings				
	1	2	3	4	5
Improved operation efficiency					
Improved Vendor-Buyer relationship					
Better quality of supplied product					
Reduction in operational cost					
Improved resource utilization					
Reduction in procurement process time					
Reduction of errors in order transmission					

To what extent has **E- Auctioning** implementation affected firm performance? Tick as appropriate using the following Likert scale of 1-5 where: 1= No Extent; 2= Little Extent; 3= Moderate Extent; 4= Great Extent; 5=Very Great Extent.

Performance Measurement	Respondents Ratings				
	1	2	3	4	5
Improved operation efficiency					
Improved Vendor-Buyer relationship					
Better quality of supplied product					
Reduction in operational cost					
Improved resource utilization					
Reduction in procurement process time					
Reduction of errors in order transmission					

To what extent has **E- Order Processing** implementation affected firm performance? Tick as appropriate using the following Likert scale of 1-5 where: 1= No Extent; 2= Little Extent; 3= Moderate Extent; 4= Great Extent; 5=Very Great Extent.

Performance Measurement	Respondents Ratings				
	1	2	3	4	5
Improved operation efficiency					
Improved Vendor-Buyer relationship					
Better quality of supplied product					
Reduction in operational cost					
Improved resource utilization					
Reduction in procurement process time					
Reduction of errors in order transmission					

To what extent has **E-Communication** implementation affected firm performance? Tick as appropriate using the following Likert scale of 1-5 where: 1= No Extent; 2= Little Extent; 3= Moderate Extent; 4= Great Extent; 5=Very Great Extent.

Performance Measurement	Respondents Ratings				
	1	2	3	4	5
Improved operation efficiency					
Improved Vendor-Buyer relationship					
Better quality of supplied product					
Reduction in operational cost					

Improved resource utilization					
Reduction in procurement process time					
Reduction of errors in order transmission					

SECTION D: CHALLENGES OF E-PROCUREMENT PRACTICES

12. To what extent does your organization face the following challenges when implementing e-procurement? Tick as appropriate using the following Likert scale of 1-5 where: 1= No Extent; 2= Little Extent; 3= Moderate Extent; 4= Large Extent; 5=Very Large Extent.

Challenges of e-procurement	Respondents Ratings				
	1	2	3	4	5
High costs of implementing e-procurement					
High cost of training staff					
Resistance to change by staff					
Lack of adequate systems security					
Inadequate technological infrastructure					
Non supporting organizational culture					
Lack of a sound change management program					
Poor e-Procurement implementation strategy					
Poor Communication Mechanisms					
Systems integration problem					
Lack of proper performance measurement systems					
Lack of supplier interest/support					

What other challenges does your organization face when implementing e-procurement?

Thank you for participating in this study

Appendix II: List of Pharmaceutical Firms in Nairobi

1. Autosterile E.A Ltd
2. Regal Pharmaceuticals Ltd
3. Medisel Kenya Ltd
4. Bayer Healthcare AC
5. Mission Pharma a/s
6. Infusion Medicare Kenya Ltd
7. C. Mehta Company Ltd
8. Pharmatis Laboratories Ltd
9. Cosmos Limited
10. Dawa Limited
11. Phillips Pharmaceuticals Ltd
12. Europa Healthcare Ltd
13. Galaxy Pharmaceuticals Ltd
14. GlaxoSmithKline Limited
15. Hetero Labs Ltd
16. Goodman Agencies
17. Harley's Ltd
18. Laborex (K) Ltd
19. Laboratory and Allied Kenya Limited
20. Biodeal Laboratories Ltd
21. Dannes Pharmacy Ltd
22. Lords Healthcare
23. British Pharmaceuticals Ltd
24. Sai pharmaceuticals Ltd
25. Nairobi Enterprises Ltd
26. Syner-med pharmaceuticals Ltd
27. Opera Pharma (k) Ltd
28. Surgipharm Ltd
29. Njimia pharmaceuticals Limited
30. Astra Lifecare
31. Pharma Specialties Ltd
32. Angelica Medical Supplies Ltd
33. Highridge Pharmaceuticals Ltd
34. Beijing holley-cotec co. Ltd
35. Tata Africa holdings (Kenya) Ltd
36. Cadila Pharmaceuticals
37. Medivet products Ltd.
38. Dominion supplies
39. Kipande Pharmacy Ltd
40. Universal Corporation Ltd
41. Elys Chemical Industries Ltd
42. Simba Pharmaceuticals Ltd
43. Madawa Pharmaceuticals
44. Ripple Pharmaceuticals Ltd
45. Pfizer Labs Limited
46. Azhar Suppliers Ltd
47. Vital Healthcare Pvt Ltd
48. Rup Pharma Ltd
49. Oss-Chemie (k) Ltd
50. Beta Healthcare

Source: Kenya Medical Supplies Authority (2015)

Appendix III: E-Procurement Practices and Operational Performance

E-Communication	Mean
The firm distributes purchasing information online	3.73
Suppliers respond to buyers information online	3.70
E-Tendering	
The firm receives responses from suppliers online	3.68
The firm sends requests for prices to suppliers online	3.53
E-Sourcing	
The firm identifies new suppliers through the internet	3.75
Suppliers submit bids along with various details over internet	3.03
E- Order Processing	
Suppliers receive and process client orders via internet	3.25
The firm makes orders for supplies online	2.98
E- Auctioning	
The firm buy goods/ services from a number of suppliers online	2.90
Suppliers compete in real time for the buyer's product request online	2.83

E-Communication

Statement	Mean
Reduction of errors in order transmission	4.36
Reduction in procurement process time	4.37
Improved resource utilization	4.29
Reduction in operational cost	4.25
Better quality of supplied product	4.19
Improved operation efficiency	4.14
Improved Vendor-Buyer relationship	3.45

E-Order Processing

Statement	Mean
Reduction in operational cost	4.37
Improved operation efficiency	4.25
Improved Vendor-Buyer relationship	4.19

Better quality of supplied product	4.15
Reduction of errors in order transmission	4.11
Reduction in procurement process time	4.10
Improved resource utilization	4.05

E-Sourcing

Statement	Mean
Reduction in procurement process time	4.15
Improved operation efficiency	4.10
Reduction of errors in order transmission	4.05
Reduction in operational cost	4.03
Improved resource utilization	3.97
Better quality of supplied product	3.96
Improved Vendor-Buyer relationship	3.81

E-Tendering

Statement	Mean
Better quality of supplied product	4.02
Improved Vendor-Buyer relationship	3.94
Improved resource utilization	3.88
Reduction of errors in order transmission	3.87
Improved operation efficiency	3.86
Reduction in operational cost	3.81
Reduction in procurement process time	3.78

E-Auctioning

Statement	Mean
Improved Vendor-Buyer relationship	3.62
Improved resource utilization	3.60
Reduction in operational cost	3.57
Reduction of errors in order transmission	3.56
Improved operation efficiency	3.55
Reduction in procurement process time	3.54
Better quality of supplied product	3.48