

**ELECTRONIC PROCUREMENT PRACTICES AND GLOBAL
SUPPLY CHAIN PERFORMANCE OF INTERNATIONAL NON-
GOVERNMENTAL ORGANIZATIONS IN NAIROBI**

BY

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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.

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DEDICATION

I dedicate this to my entire family “The Wayamba’s” and more importantly my sister Elizabeth Wayamba for the continuous motivation and financial support granted to me through this project. To my supervisor Mr. Michael Chirchir and Moderator Mr. Ernest Akello (Lecturers in department of Management science), I say thank you.

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Special appreciation and thanks to God the Father and Almighty for granting me this opportunity and bringing me this far in my journey to Education Excellence.

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ABBREVIATIONS AND ACCRONYMS

BSC	-	Balance scorecard
SC	-	Supply Chain
GSCM	-	Global Supply Chain
GSCP	-	Global Supply Chain Performance
INGO's	-	International Non-Governmental Organization
E-Procurement	-	Electronic Procurement
IFMIS	-	Integrated Financial Management Information System
SCOR	-	Supply Chain Operations Reference

ABSTRACT

International non-governmental organizations (INGO's) are key to Kenya's economy based on the role they play in fostering local development, fighting for human right and humanitarian activities. The study purpose was to establish the extent of electronic procurement practices implementation in INGO's in Nairobi, to determine the impact of electronic procurement practices on global supply chain performance in INGO's in Nairobi and to investigate the barriers faced in implementation of electronic procurement in INGO's. It was specifically intended to establish how, electronic sourcing, electronic tendering, electronic requisitioning, electronic approvals and electronic payments affect Global Supply Chain Performance (GSCP) of INGO's in Nairobi. The study was guided by technology acceptance model and transactional cost economics theory. Data collection was effected by use of structured questionnaires which were distributed through drop and pick method to all INGO's in Nairobi. Procurement/ Supply Chain Managers or their equivalent were the targeted population from the sixty-four (64) INGO's in Nairobi. Data collected was examined by using descriptive and multiple regression analysis. The findings of the study concluded that implementation of electronic procurement practices in INGO's in Nairobi is to a moderate extent. The second objective being investigated indicated that there exists a positive relationship between implementation of electronic procurement practices and Global Supply Chain Performance in INGO's in Nairobi as per the results obtained. Besides 46%, of quality, 73% of cost reduction, 51% of timeliness and 64% of responsiveness was affected by implementation of electronic procurement practices. Based on barriers, the study findings were: high costs of implementation of e-procurement, high costs of training staff, resistance to change by staff, inadequate technological infrastructure, non-supporting organizational culture lack of performance measurement systems were the significant barriers to implementation of electronic procurement in INGO's in Nairobi among others. The main limitation of the study was that the INGO's being studied were only in Nairobi County based and also the GSCP studied were constrained to four i.e. Quality; Cost; Time and Responsiveness. To mitigate on these limitation future academicians should research on electronic procurement practices in other firms rather than INGO's in Nairobi and should expound on the global supply chain performance other than quality, cost, time and responsiveness.

Key words used in the study are Electronic Procurement Practices, Global Supply Chain Performance and International Non-Governmental Organizations.

CHAPTER ONE: INTRODUCTION

1.1 Background

Since the commencement of internet in 1995 (Kenneth Laudon and Carol Traven (2011), electronic commerce has impacted the whole world and shaped how organizations conduct business from a global perspective (Carl McDaniel & Lawrence Gitman, 2008). The world is becoming more of a global village resulting to complex business models, increased competition, business collaboration and increased customer service level. Local organizations are now in direct completion with international firms on how they operate and manage their supply chain. The dynamic macro-economic factors affecting organizations activities such as information communication and technology (ICT), have stimulated most organizations to formulating strategies and measures to adopt electronic commerce in their business model and have a competitive niche in the local and global market (Carl McDaniel & Lawrence Gitman, 2008). Supply chain management constitutes a larger extent to the success and operations of organization, it is through supply chain optimization that an organization can effectively minimize its business risk and become more responsive to the market changes, this is especially elaborated when current technologies and strategies for instance integration, collaboration, resource planning are used as an integral part of the business activities (Akintonye, 2000).

New trends in the global market has forced organizations to realign their supply chains activities and corporate strategies (Gimeze & Ventura, 2005). One of this strategies is electronic procurement where acquisitions are made using the internet, through e-procurement organizations are able to procure goods at the right place, time, quality, quantity, form and source (Baily et al, 1999). To remain competitive, firms have adopted e-procurement as an important strategic tool where organizations are leveraging on it, (Stock and Lambert, 2001). Reengineering operations is a key requirement in the quest to adopt globalization and technology shifts require (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) for firms to attain customer satisfaction and customer loyalty, they need to work closely with suppliers, manufacturers, distributors, warehouses, transporters, retailers as well as the customers to ensure high level of customer satisfaction and optimization of supply chain performance through timely delivery of desired goods, better quality, minimal cost etc. Firms that

integrate ICT in their supply chain process increase their performance efficiency and effectiveness therefore Electronic procurement supported by ICT infrastructure has resulted to performance improvement (Musau, 2015).

The Kenya the government has embraced technological shift in adopting information technology in their supply chain processes this is evident through the implementation of Integrated Financial Management Information System (IFMIS) an enterprise resource that operationalizes how purchases are done and invoice are approved for payments. According to Carr and Smeltzer (1997) electronic procurement practices are vital functions in government activities, since procurement and supply chain process is a critical step on how government budget and spend public resources. This system has enabled computerization of purchases and supply chain activities made by all government agencies. The Kenyan constitution also promotes use of electronic platform in how government agencies procure goods and services (Public Procurement and Disposal act of Kenya, 2015)

This study was guided by the following theories; The Technology acceptance model which states that foundation for determining the influence of external variables measures on beliefs, attitudes, and intentions are fundamental in the enactment of technology in firms. Technology acceptance model assumes that beliefs about usefulness and ease of use are the primary determining factor of information, communication and technologies adoption (Venkatesh, Xu, & Tam, 2011). The theory of cost economics which states that there is need for adequate evaluation of the cost implications of decisions by firms before a firm can implement various practices.

1.1.1 Electronic Procurement Practices

Procurement refer to all activities involved with obtaining goods, services and information from suppliers; this include purchasing, inbound logistics such as transportations, warehousing before they are used (Dave Chaffey, 2009). The procurement cycle can be grouped in steps, this include need identification, pre-solicitation (information gathering, through use of request for quotation/information/proposal/applications and setting up of evaluation criteria's), solicitation evaluation and award process and finally contract process.

Electronic procurement is the integrated use of ICT to manage the purchasing cycle and connecting the buying agent and external and internal environment in the supply chain. E-procurement tools

help to deliver a variety of solutions that results to purchase and better management of the supply chain (CIPS, 2014). According to Egbu (2003) electronic procurement is the process of buying goods, services and information on an on-line platform. Usage of ICT in the procurement stage of sourcing and identification, negotiation and contracting, order placement, delivery and inspection, and after sales services is universally known as electronic procurement Croom & Brandon-Jones (2004). Implementation of electronic procurement has benefited and improved the procurement process through facilitating evaluation of end to end trading cycle, increased market through e-markets, reduced procurement timeframe and helped eliminate inefficiency and costliness that were attributed to traditional modes of procurement.

Electronic procurement has improved procurement efficiency and effectiveness and by extension supply chain performance, (Manrodt, Gibson, & Stephen 2005). The implementation of electronic procurement systems has been adopted to manage and execute procurement activities. These electronic software and electronic system integrates procurement functions and supply chain activities, the interface created can be used as a performance measure to track real-time status of activities (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). Depending on the method of purchase by organizations, e-procurement can be systematic sourcing or spot sourcing, the increased benefit and customizability of e-procurement, has led to many organizations; private, public and non-governmental to adopt e-procurement systems. Electronic procurement practices include: e-tendering e-sourcing, e-requisitioning, and e-payments. Optimize

1.1.2 Global Supply Chain Performance

Global Supply Chain Management is the augmentation of material flow, associated information flow and coordination of supply chain activities involved with an organizations operation on an international platform (Dave Chaffey, 2009). Global supply chain is a network that links between an organization and all partners involved with movement of goods, services and information on the upstream and downstream network. These global supply chain players include supplier, manufacturer, warehouse, distributors, transport, retailer and customer. Each organization has its own supply chain and once these organizations partner or collaborate and have international

linkage they form a global supply chain and it is within they business model strategy to optimize and rationalize its supply chain to attain maximum performance.

Global Supply Chain performance (GSCP) is the process to quantifying the efficiency and effectiveness of actions and activities in upstream and downstream of a cross boundary supply network (David Barnes, 2008). The ability of an organization to effectively lower its logistics, inventory, shipping, customs and duty clearance warehousing and transport cost by ensuring desired goods and services are procured at the right place, form, time, quantity, quality is a measure of its supply chain performance (Zhang and Okoroafo, 2015). ICT is pivotal to global supply chain management, this is because management of relationships among customers, suppliers and intermediaries is based on information flow and transactions between these players in the value chain. The main strategic and tactical thrust or metric of ensuring that consumer needs are met through supply chain activities is what is referred to as supply chain performance (Kwai et al., 2004). Supply chain performance is measured using various performance metrics, determining what to measure is the key issue in global supply chain performance.

Performance measurement and metrics pertaining to GSCM have not been adequately researched by scholars or practitioners, the fact that there is lack of performance measurement in determining supply chain performance can be concluded as the major hindrance in determining GSC (Charan P, 2008). To determine the global supply chain performance two frameworks have been adopted i.e. the balance score card and the Supply Chain Operations Reference model mostly known as SCOR. For this study the SCOR model has been used as a framework to establish the global supply chain performance metrics. The SCOR process reference models integrate the well-known concepts of business process engineering, benchmarking, process measurement and organizational design into a cross-functional framework. It is unique in that it links business processes, performance metrics, practices, and people skills into a unified structure. It is hierarchical in nature, interactive and interlinked. Three categories of measures can be derived from the SCOR model; economy, efficiency and effectiveness, usually known as the three E's of performance measurements (David Barnes, 2008). Measure of economy on the SCOR model are concerned with the cost associated with movement of goods, services and information across the SC, measures of efficiency are concerned with the performance in terms of ability to optimize resources and measures of effectiveness are concerned with the extent at which resources met customer

requirement. Therefore, the GSCP indicators used in this research can be summarized to include quality, timelines, cost and responsiveness.

1.1.3 International Non-Governmental Organizations in Nairobi

International Non-Governmental Organization (INGO) is an association which is not profit driven, it operates outside political institutions, they pursue the interest of its member through petitioning, coaxing, or direct action with involvement or interaction in more than one country or national boundaries (World Bank Operational Report, 2002). INGO's, are usually regarded as affiliations formed by governments, public institutions or bilateral inter government agreements (Jacobson, 1994). INGO's are defined as private voluntary groupings which are made up of individuals or associations that are operated for other purposes rather than commercial or profit. International non-governmental organizations in Kenya are grouped broadly into: international NGO's which operate within Kenya based on certificate of registration they possess but have been incorporated in other countries rather than Kenya. The other type is the national NGO's which operate in their local countries. INGO are mostly headquartered in developed countries and carry out operations in more than one developing country. Many INGOs consult with United Nations and international development agencies relevant to their mission and objective of existence.

The NGO's were first started in 1839. Most of NGO's are donor driven and different donors vary in terms of how they account for their resources and report to their funders hence this affects the kind of activities the NGO's engage in and even provision of funds for career development activities, (Oster, 2004). According to the records held at the NGO Registration Board as of 2016, the total number of INGO's in Nairobi are 64. (Council of NGO 2015). Globalization and democracy in Kenya has significantly contributed to increase in the number and footprint and operations status of INGO's (NGO directory, 2017).

The INGO's are important in the economy based on the roles they play. They are key in development of a country's economy through various projects that they implement like construction of water projects, construction of schools, funding education, rural health among others. They empower various groups of people in the society like the marginalized people: the old, widows, raped girls, through programs that help improve their life standards. They provide

funding and other resources in times of disasters like floods, earthquakes and other emergencies to those affected (NGO directory, 2017).

1.2 Research Problem

The present-day business environment is getting more challenging, in order to stay competitive, firms have to expand their business operations and improve their performance. Implementation of effective and efficient procurement practices is the most critical aspect of enhancing business operations (Markus, 2013). Procurement is very important to the success of a firm since it is part of principles of management of plans that focus on effective achievement of not only performance but also the growth of the firms and the whole nation at large. A well planned and implemented procurement process, act as an economic instrument for guaranteeing national development (Keith et. al, 2016). The procurement practices are fragile and predisposed to regular discontinuities (Jeppesen, 2010). There is need for provision of quality goods and services by firms at low costs as a fundamental key for improved supply chain performance due to increased competition and globalization in the external environment. E-procurement when adopted, result to secure and high levels of customer satisfaction and return business (Anderson & Mittal, 2000).

The INGO's are faced with a number of challenges in their execution of their day to day operations like sourcing for funds for the INGO's, challenges in the funds distribution, obstacles in the funds transfers and operational inefficiencies among many others are the various challenges faced by INGO's (Bohm, 2007). To curb this, there is need for adoption of e-procurement practices that will result to fast efficient operations in the firm that will help in improvement of the level transparency and responsiveness of the procurement process. According to Ejura (2014) that the current procurement industry is faced with major limitation of limited regulation models and non-compliance and pitiable execution process which acts as major hindrances to the procurement processes.

Numerous studies have been carried out globally on e-procurement practices, Irani (2010) researched on analyzing business to business (B2B) benefits of electronic procurement: information systems perspective. The study aim was to present benefits of electronic procurement identified in four case companies from the information technology (IT), hi-tech sector. The study findings indicated that to large extent implementation of e-procurement

facilitates the firm's ability to improve its performance and B2B operations. However, the study was based on information systems perspectives and failed to tackle on the impact of e-procurement on global supply chain performance

Soysal and Calipinar (2012), researched on e-procurement practices in the health sector in Turkey where he established 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 sector in Turkey and hence the findings could not be applicable to the to the African context and Kenya specifically. Mavin (2013) researched on Impact of e-procurement on procurement practices and performance. The purpose of the study was to ascertain the effect of implementation of e-procurement on procurement practices and performance of the procurement function. However, the study failed to look at the effect of e-procurement management practices on global supply chain performance of INGO in Nairobi. Mukherejee, (2013) examined e-procurement technologies agro-based SME's in Malaysia, where he ascertained that the adoption e-procurement is affected by factors like cost, commitment. However, the study was based in agro based SME's in Malaysia and hence the findings would not be applicable in the Kenyan context. Qesada (2016) carried out a study on the effect of e-procurement on procurement practices and performance. The study concluded that there is a correlation in implementation of e-procurement and performance of firms.

Locally a study carried out by Kagai (2013), on electronic procurement in private universities in Kenya indicated that adoption of electronic procurement leads to improved supply chain performance in the private universities in Kenya. It further established that resistance to change, lack of adequate funds and lack of adequate skills are the major barriers of e-procurement implementation in the private universities in Kenya. However, the study suffered a methodological weakness based on the fact that it was solely based on the private universities and not the INGO's in Nairobi. Obat (2016), in researched on critical success factors in the implementation of e-procurement in public entities in Kisumu county, Kenya. The study purpose was to ascertain the critical successes factors in the implementation of e-procurement in Kisumu county. The study ascertained that adequate IT infrastructure, adequate training of employees, top management support is key to the implementation of e-procurement. The study however, failed to look at the impact of e-procurement on global supply chain performance. In addition, it was solely based in

Kisumu county. Kanana (2016) in her study on e-procurement implementation and performance of county governments in Kenya. The study aim was to establish the e-procurement management practices and their impact on performance. The study ascertained that there was a positive impact between e-procurement implementation and supply chain performance in county governments. However, the study was solely based on the county governments and failed to focus on INGO's in Nairobi. A study by Ngeera (2016) on e-procurement management practices and performance of pharmaceutical firms in Nairobi ascertained that there exists a positive relationship between 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 INGO's in Nairobi. A study carried out by Onjala (2017) on the effect of adoption of electronic procurement and supply chain performance in dairy firms in Kenya established that implementation of e-procurement practices results to an improved level of supply chain performance of dairy firms in Kenya. However, the study had a weakness based on the fact that it was based on dairy firms in Kenya and not the INGO's in Nairobi.

From the studies above, it can be confidently determined that there is a knowledge gap based on the limited studies carried out by academicians and scholars on the impact of electronic procurement practices on GSCP of INGOs in Nairobi. This study therefore sought to answer the following research questions: What is the extent of implementation of e-procurement practices in INGO's in Nairobi? What is the effect of e-procurement practices on GSC performance of INGO's in Nairobi? What are the barriers faced by INGO's in Nairobi in the implementation of e-procurement practices?

1.3 Research Objectives

1.3.1 General objective:

To institute the relationship between electronic procurement practices and global supply chain performance in INGO's in Nairobi.

1.3.2 Specific Objectives

- i. To establish the extent of implementation of electronic procurement practices in INGO's in Nairobi.
- ii. To establish the effect of implementation of electronic procurement practices on global supply chain performance in INGO's in Nairobi.
- iii. To establish the barriers faced in the implementation of electronic procurement practices in INGO's in Nairobi.

1.4 Value of the Study

Numerous stakeholders in the INGO's and development sector country wide will benefit from this study more importantly the Nairobi County based. INGO's will benefit from this study on the role e-procurement implementation plays in the global supply chain performance of INGO's.

Other NGO's (local) 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 practices. The supply chain managers in these INGO's will understand the benefits of adopting e-procurement practices. By understanding what impact that adoption of e-procurement 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 thee-procurement and SC performance. Policy makers will also benefit from this study on the areas of electronic procurement practices that require policy and regulation interventions for the purpose of transparency, accountability, efficiency and effectiveness in the supply chain operations.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter summarizes the theoretical framework, highlights electronic procurement practices, global supply chain performance measures, literature review and finally the conceptual framework which is the foundation of the study.

2.2 Theoretical Framework

A number of theories that relate to this research have been developed and proposed, these theories make up a basis and theoretical framework of the research. They include theoretical principles and the various findings of the studies. This study was guided by:

2.2.1 Technology Acceptance Model

Technology Acceptance Model (TAM) is a prominent and fundamental theory used to provide explanation and justification on behavior for adopting information technology (Hong, 2011). The basic objective of this theory is to establish the influence of external variables on internal beliefs, attitudes, and intentions. The beliefs of usefulness and easiness of using technology is a primary determining factor for technology adoption in firms (Venkatesh, Xu, & Tam, 2011). According to TAM, ease of use of technology and its usefulness influences the acceptance and adoption of this practices, mainly through behavioral change. Perceived usefulness refer to the degree at which an individual believes using a system will result to a performance enhancement. Perceived ease of utilization of technology is the degree at which an individual perceives that utilization of a system will reduce intellectual effort (Davis, 1989). Implementation of electronic procurement tends to receive a number of challenges in terms of resistance from the employees, customers and user departments. There is need for commitment from top management in the adoption and sensitization of electronic procurement practices in the firms and facilitate they manage for successful implementation. In addition, there is need for adequate training of staff on the electronic procurement implementation.

2.2.2 Transactional Cost Economic Theory

Transactional Cost Economic Theory (TCET) seeks to address fundamental questions on an organizations core competence and what activities should be sourced in house or outsourced.

Optimizing the organization cost will result to ongoing concern of these organization. In implementing E procurement practices firms have to evaluate the associated costs and rationalize how the organization will be governed to avoid waste (Coase, 1997) e.g. unnecessary expenditures like bid committee fees, physical tender preparation cost etc.

An organization that implements E procurement will benefit from better lead and delivery times, organization responsiveness, customer satisfaction and cost minimizations to mention a few, Mari Sako (1992) through optimizing resource allocation.

2.3 E-procurement Practices

With the emergence of internet as a connection platform and a supply chain tool in the early 1990s various e-procurement practices have been adopted by firms with the objective of becoming effective and efficient as they meet organizations goals. The benefits that were attributed to e-procurement adoption by organizations included, better lead times, cost reduction, profit optimization, process and operations streamlining, improved contract compliance and customer satisfaction, improved organization responsiveness in terms of agility and market dynamics, increased global market presence to mention a few. This study will limit to the main e-procurement best practice components for research. This will include e-requisitioning, e-sourcing, e-tendering, e-approval and e-payments.

Electronic requisitioning is the use of internet tools in the process of requesting for goods, services and information by organizations factoring in end user need. By use of e-requisitioning, one is able to plan and source the necessary goods or services, evaluate user required specifications and available budget. The process begins with preparing a purchase request which is then sent to the procurement department. Use of e-requisitioning facilitates improved performance of a firm's procurement process based on a study carried out (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 and specifications 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.

Electronic sourcing is the use of internet resources in conduction market research for intended purchases, this information includes supplier's identification or market knowledge management. 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).

Electronic tendering involves the process that are involved in sending requests from information, request for quotations, request for proposal etc. 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 (Gawnawardhana, 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

Electronic approvals entails making consents and agreement online to facilitate organizations and individuals authorize purchase so as to enter into a contractual agreement. This is done through electronic signatures, electronic EPR approvals, emails etc. E-Approvals results to significant time, resources and cost savings over traditional approval methods. With the extent of internet coverage legal measure has been made to ensure e- approvals carry the same weight as traditional approvals.

Electronic approvals result to issuance of purchase order, subcontracts, blank purchase agreements, cooperative agreements and grants (Kimutai, 2017)

Electronic payments are a mechanism used by players in the supply chain to present claim for compensation on an electronic platform for goods, services rendered. These forms include electronic invoices, electronic approved purchase orders, electronic debit notes, electronic credit fees, electronic fund transfer and proof of payments. 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). Through implementation of e-invoicing facilitates there is increased operational performance of a firm. 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). A variety of technological tools have been advanced to be used as entry options for claim to be presented to customers or sellers for payment purposes. e.g. e-wallets (visa, pay pals) and international cards.

2.4 Global Supply Chain Performance

Global Supply chain performance is a comparative measure that explains how organizations utilizes available resources to meet customer and organizational needs. Performance measurement is systematic process of quantifying organization activities and outputs (Neely et al., 1997). Performance measures evaluate the optimization of resources utilization in achieving organization objectives. It measures the efficiency and effectiveness of the management in resource allocation and growth (Chan 2005).

The extent to which global supply chain's activities meet end customer need is what is termed as global supply chain performance (Kwai et al., 2004). GSCP is measured using various performance metrics of responsiveness. According to (Cuthbertson and Piotrowicz, 2011), SCOR model individual measures of global supply chain performance can be quality, time, cost, flexibility and responsiveness forming the focus of this study.

2.5 E-procurement responsiveness to Supply Chain Performance

The E-procurement processes and structure aids the realization of effectiveness and efficiencies of process of procurement processes. E-Procurement offers considerable cost savings and promotes operational efficiency 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).

2.6 Empirical Literature Review

This section contains literature review of studies done both on e-procurement. Globally, Reddick (2004) studied on The growth of electronic procurement in American state governments: A model and empirical evidence. The study adopted use of descriptive statics in its study. The study aimed at instituting the growth of e-procurement in American state governments. The study findings indicated that there exists a positive support for electronic procurement on state management capacity and IT management capacity, indicating that high performing management is a critical catalyst for development of e-procurement. However, the study was solely based in the American state governments and could not be applicable to the INGO's in Nairobi.

Mavin (2013) researched on Impact of e-procurement on procurement practices and performance with an aim of establishing the effect of e-procurement implementation on procurement practices and procurement function performance. The study adopted use of descriptive statics in its research. The study findings indicated that there exists a positive correlation in implementing e-procurement versus supply chain performance. However, the study failed to look at the consequence of e-procurement practices to global supply chain performance of INGO in Nairobi

Soysal and Calipinar (2012) carried out a study on e-procurement practices in the health sector in Turkey. The objective of the study was to discover the effect of implementation of e-procurement practices on performance Turkey health sector. The study adopted descriptive research design where data was collected using structured questionnaires from a sample size of 78 firms. 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 established that implementation of e-procurement practices has apposite impact on performance of health sector. However, the study was sole based on the Health sector in Turkey. In addition, the study was based on Turkey and hence the study findings would not be applicable to the African context.

Lewis (2004) carried out research titled “Essentials of e-Sourcing: A Practical Guide for Managing the RFX Process in an “E” Environment.” The research showed that e-procurement may be installed as tool for reducing process cycle period, enhancing procurement savings thus increasing profitability. He added that the adoption of e-sourcing begins with the choosing of an electronic tool to support organizational strengths, and it should be followed change management as well as the training of personnel and other interested parties where applicable. The major constraint remained obstruction by the management.

Vaidya and Callender (2006) investigated the important aspects that affect the success of adopting electronic procurement within the public sector, and they came up with end-user acceptance as well as training, acceptance by supplying vendors, system integration, information integrity, security, and authentication, the process of re-design, performance metrics, the performance of top leadership, change management plans, and ICT infrastructure as the key success factors in the execution of e-procurement.

A study carried out by Mukherjee (2013) on e-procurement technologies agro-based SME’s in Malaysia established that the implementation e-procurement is affected by factors like cost, commitment. The study ascertained that e-requisition, e-sourcing, e-tendering, e-approval and e-invoicing had been majorly adopted as e-procurement practices. The study aimed to ascertain the impact that implementation of e-procurement technologies has on performance of agro-based

SME's in Malaysia. The study adopted use of descriptive research design. The study findings established that. However, the study was based in Malaysia and hence the findings could not be applicable to the Kenyan context.

A study carried out by Quesada (2016) researched on the effect of electronic procurement on procurement practices and performance whose aim was to ascertain the impact of e-procurement practices on procurement management practices implementation and performance, ascertained that there exists a positive relationship between implementation of e-procurement and performance. The study adopted use of descriptive research design in its research methodology where data was collected by use structured questionnaires and interviews from the respondents. However, the study was solely based on the effect of e-procurement practices on procurement practices and performance and failed to look at extent of e-procurement practices on SC performance.

A study by Obat (2016), in researched on critical success factors in the implementation of e-procurement in public entities in Kisumu county, Kenya. Its purpose was to ascertain the critical successes factors in the implementation of e-procurement in Kisumu county. The study ascertained that adequate IT infrastructure, adequate training of employees, top management support is key to the implementation of e-procurement. The study however, failed to look at the impact of e-procurement on global supply chain performance. In addition, it was solely based in Kisumu county

Kinoti (2013) on e-procurement and supply chain management performance in government parastatals in Kenya was aimed at ascertaining the impact that e-procurement management practices on supply chain performance of government parastatals in Kenya and the challenges faced in the implementation. The study adopted use of descriptive research design of which data was collected by use of questionnaires. The findings of the study established that implementation of e-procurement practices has a positive correlation to performance of parastatals in Kenya. Besides the study established that suppliers are vital in the implementation of e-procurement practices. However, the study was solely based in government parastatals in Kenya. However, the study was solely based on the government parastatals.

Kagai (2013) in his study on electronic procurement in private universities in Kenya established that to a great extent the private universities had adopted e-procurement practices. The study objectives were to establish 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 22 universities where they established that there exists a positive relationship between implementation of e-procurement and supply chain performance. However, the study was solely based in private universities in Kenya and failed to look at private universities in Kenya.

A study carried out by Ngeera (2016) on e-procurement practices and performance of pharmaceutical firms in Nairobi was aimed at establishing the impact that implementation of e-procurement practices on performance and the extent of implementation in pharmaceutical firms. The study adopted use of descriptive statics where data was collected by use of questionnaires from a sample size of 40 firms. From the findings it was established that there exists a positive relationship between implementation of e-procurement practices and performance in pharmaceutical firms in Kenya. In addition, the study established that to a large extent e-procurement practices had been put in practice in various pharmaceutical firms in Kenya. The study however was solely based on pharmaceutical firms in Nairobi and failed to look at INGO's in Nairobi.

Kanana (2016) in her study on e-procurement and performance of county governments in Kenya ascertained that there exists appositive relationship between implementation of e-procurement and supply chain performance in county governments. The study aim was to establish the extent to which e-procurement practices had been implemented in county governments in Kenya and its impact of performance. The study adopted use of descriptive statics where data was collected from a population size of 47 counties. However, the study was based on the county government and not INGO's.

A study was carried out by Onjala (2017) on the effect of implementation of electronic procurement and supply chain performance in dairy firms in Kenya. The purpose of the study purpose was to establish the various e-procurement practices and the impact that implementation of e-procurement practices has on performance. The study adopted use of descriptive statics in its methodology whereby the data was collected by use of data questionnaires from the respondents.

From the study findings there exists a positive relationship between implementation of e-procurement practices and supply chain performance 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 failed to look at the impact e-procurement implementation has on global supply chain.

2.7 Barriers to E-procurement Implementation

Organization policy, supplier enablement, management support and employee knowledge are main barriers to electronic procurement implementation. Lack of support from top management may as well mean resistance and failure of implementation (Grandon & Pearson, 2004). Studies such as Mose, Njihia and Magutu (2013) established that major challenges facing implementation 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), implementation of e-procurement is poor telecommunication infrastructure, readiness of customers and vendors, government policies, high costs of internet usage and training of employees. Halihah (2010), established that limited commitment and ownership to support and push e-procurement implementation is a major barrier to the implementation of e-procurement in organizations. 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. Budget and policy support. 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. There is a

relationship between supportive technological infrastructure and supply chain effectiveness and efficiency.

2.8 Summary of Literature Review

A literature review summary is provided in table 2.1. The table contains research studies, major findings and identified research gaps.

Table 2.1 A summary of Literature Review

Scholars (s)	The study	Major Findings	Research Gaps
Calipinar (2012)	e-procurement in the health sector in Turkey	Use of technology improves the system of supplies of drugs in the pharmacies. Adoption of e-procurement had a positive impact on performance	The study was solely based in Turkey and hence the results could not be applicable in the Kenyan sector
Kinoti(2013)	E-procurement adoption in government parastatals in Kenya: the supplier perspective	Suppliers are key in the determination of implementation of e-procurement. Costs, resistance to change lack of top management support were the major challenges facing adoption 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.
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

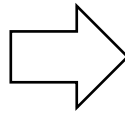
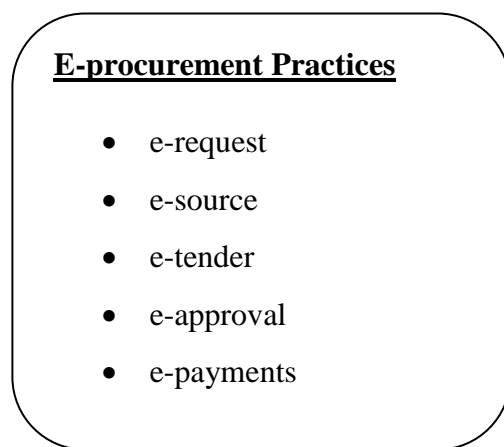
Ngeera (2016)	E-procurement and operational performance of pharmaceutical firms in Nairobi	Adoption of e-procurement has a positive impact on performance. E-sourcing, e-tendering, e-invoicing and e-approval had been adopted in the pharmaceutical firms to a great extent	The study was solely based on pharmaceutical firms in Nairobi
Quesada (2016)	E-procurement effect on procurement management practices and operational performance	A positive relationship exists between e-procurement and procurement management practices	The study failed to tackle on e-procurement management practices and performance in pharmaceutical firms in Nairobi
Onjala(2017)	Electronic procurement and supply chain performance	Adoption of e-procurement practices has led to increased transparency, reduced lead times. Resistance to change, high capital investment were the challenges of e-procurement implementation	The study was solely based on agro-processing diary firms.

2.9 Conceptual Framework

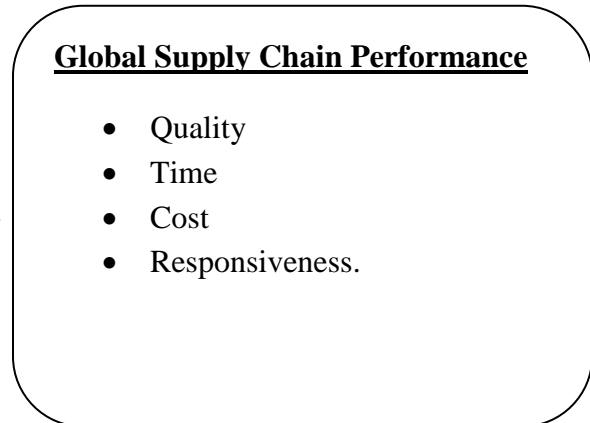
The conceptual framework outlined below shows the relationship between e-procurement on global supply chain performance. Independent variables are: E-procurement practices which include: e-requisition, e-sourcing, e-tendering, e-approval and e-payments while the dependent variable is global supply chain performance indicators which are quality, time, cost and responsiveness.

Figure 2.2: Conceptual Model

Independent variables



Dependent variable



Source: Research Data (2018)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter contains information about the research design and population that was used in the study. Techniques employed in data collection and analysis and presentation are also highlighted in this section.

3.2 Research Design

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

3.3 Target Population

The population of the study was INGO's in Nairobi. According to the NGO's coordination board, there are 64 INGO'S in Nairobi (appendix II). A census was carried out on all the 64 INGO's in Nairobi, since the population size was relatively small.

3.5 Data Collection

The study used primary data which was collected through the use of a structured questionnaire. The questions were constructed in a manner that they were able to address specific objectives and offer a variety of possible responses. Section A of the questionnaire contained the demographic information of the respondents, section B contained information on the extent of implementation of e-procurement practices, section C contained information on the effect of e-procurement practices on GSC performance of INGO's. The questionnaires were sent to the heads of the various supply chain departments or their equivalents. The questionnaires were issued through "drop-and-pick" later and others sent via e-mail to the recipient.

3.6 Data Analysis

The data obtained from the interview guide was analyzed using quantitative analysis. Data collected was screened for accuracy, consistency, uniformity and completeness in preparation for analysis. The data was summarized and tabulated using descriptive measures. Extent of implementation of e-procurement practices was analyzed by use of descriptive statistics, data from objective two on the effect of e-procurement practices on GSC performance was analyzed by use of correlation and regression analysis. Finally, descriptive statistics was used in analyzing data on barriers of e-procurement implementation in INGO's. The regression model is:

$$Y_1 = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Where;

Y_1 = Global supply chain performance (Quality)

Y_2 = Global supply chain performance (Time)

Y_3 = Global supply chain performance (Cost)

Y_4 = Global supply chain performance (Responsiveness)

α – This is a regression model constant

$\beta_1, \beta_2, \beta_3, \beta_4$ and β_5 – Are constants regression coefficients as follows:

X_1 – e-requisitioning

X_2 – e-sourcing

X_3 – e-tendering,

X_4 – e-approval,

X_5 – e-payments.

ϵ - Error term which explains the variability of the factors that are not in the model and chance variation.

CHAPTER FOUR: DATA ANALYSIS, FINDINGS, AND DISCUSSION

4.1 Introduction

This chapter is made up of data analysis, findings and interpretation. It represents discoveries on the data sought on electronic procurement practices and supply chain performance of INGO's in Nairobi. The purpose of the study was to determine the extent to which electronic procurement practices has been implemented in INGO's in Nairobi and to determine the effect of electronic procurement practices on GSC performance. The study target population was the procurement/ Supply Chain managers or their equivalent in the procurement, operations department. The questionnaires were issued by the researcher and three research assistants and follow-ups through e-mails and telephone calls made.

4.1.1. Response Rate

A total of 45 out of 64 questionnaires distributed were received and deemed fit for data analysis this translated to a response rate of 70.3%. According to (Mugenda & Mugenda, 2003) a response rate of above 70% is considered very good and adequate for comprehensive data analysis. Therefore, this data was established to be able to provide substantial information and inferences that can be used in generalization of the various aspects of the study, therefore data analysis was done.

4.2 Demographic Information

The researcher intended to determine background information of the respondents working in the INGO's identified for study. Demographic data was collected on various characteristics of respondents so as to evaluate gender parity, education qualification and work experience of the respondents to establish their ability to effectively and correctly understand and respond to the questions of study.

4.2.1 Gender

The table below represents information on the responses based on gender of the respondents. As shown in the table below: 49 % of the respondents were male while 51% were female concluding that there was gender balance in the rate of response i.e. insignificant gender bias. The findings of the study are as shown in the table below:

Gender	Frequency	Percent
Male	22	49
Female	23	51
Total	45	100.0

Source: Research Data (2018)

4.2.1 Education

The respondents were required to indicate their level of education. The table below represents information based on their responses.

Table 4.2 Education

Experience	Frequency	Percent
College	5	11
Undergraduate	13	29
Masters	27	60
Total	45	100

Source: Research Data (2018)

From the table above it can be seen that 11 % of the respondents had college level education, 29% of the respondents had undergraduate level of education while 60% of the respondents had a master's degree level of education. An indication that all the respondents had adequate relevant education background and were in a position to provide information sought by the researcher.

4.2.3 Experience

The respondents were required to indicate their level of experience; the table below represents information based on their responses. Based on the table below: it can be seen that 22% of the respondents had experience less than two years, 36% of the respondents had 2-5 working experience while 25% of the respondents had experience of between 6-10 years and finally 17% of the respondents had an experience of over 10 years. This indicates that all the respondents had adequate experience and had a detailed understanding of the study sought by the researcher.

Table 4.2 Experience

Experience	Frequency	Percent
under 2 years	7	16
2-5 years	20	44
6-10 years	13	29
over 10 years	5	11
Total	45	100

Source: Research Data (2018)

4.3. Implementation of Electronic Procurement

The first objective of the study was to ascertain the extent of implementation of electronic procurement in INGO's in Nairobi. Descriptive statistics was used on all the electronic procurement practices being investigated by the study on a Likert Scale of 1-5 where;

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

The findings are as shown in the table below:

Table 4.3 Implementation of Electronic Procurement

	Mean	Std. Deviation
E-requisitioning	3.5319	.80355
E-sourcing	3.5532	.58267
E-tendering	3.2979	.50712
E-approval	3.5745	.54152
E-payments	3.5319	.50437

Source: Research Data (2018)

The study findings indicated that to a moderate extent all the electronic procurement practices had been implemented by the INGO's in Nairobi as indicated: E-requisitioning indicated a mean of 3.5319, E-sourcing indicated a mean value of 3.5532, E-tendering indicated a mean value of 3.2979, E-approval indicated a mean value 3.5745 while E-payments indicated a mean value of 3.5319. Hence electronic procurement has been implemented to a moderate extent in INGO's. The INGO's in Nairobi carry out purchasing which is done on day to day basis. They have to carry out procurement processes at low costs and efficiently. This is facilitated by adoption of electronic procurement practices.

4.4 Relationship between Electronic procurement and Quality as a Global Supply Chain Performance

The second objective of the study was to ascertain the effect of implementation of electronic procurement on quality as global supply chain performance measure in INGO's in Kenya. The study adopted use of multiple regression on all the global supply chain performance, measures as indicated below:

4.4.1 Coefficients

Table 4.6 Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	1.671	.922		1.811	.078
E-requisitioning	.257	.161	.208	1.598	.118
E-sourcing	.053	.144	.049	.369	.714
E-tendering	.381	.128	.397	2.974	.005
E-approvals	.391	.153	.380	2.559	.015
E-payments	.069	.114	.081	.599	.552

a. Dependent Variable: Quality

b. Predictors: (Constant), e-requisition ,e-sourcing, e-tendering, e-approvals, e-payments

Source: Research Data (2018)

From the table above it can be seen that, e-requisitioning and quality are positively and insignificantly related. ($t=1.598$, $p=0.118$). This indicates that an increase in the level of adoption of e-requisitioning by one unit, results to related increase in the quality of products and services offered by 0.257. Besides e-requisitioning had $p=0.118$ value an indication that e-requisitioning is not statically significant at 0.05 critical value since it is more than 0.05. e-sourcing and quality are positively and insignificantly related ($t=0.369$, $p=0.714$) which is an indication that an increase in the implementation of e-sourcing by one unit, results in a related increase in quality by 0.053 all other factors held constant. Besides, $p=0.714$. The p-value of 0.714 is greater than 0.05 and hence. e-sourcing is statically insignificant.

E-tendering and quality are positively and significantly related, ($t=2.974$, $p=0.005$) which indicates that implementation of e-tendering leads to an improvement in quality of goods and services by 0.381. The p-value associated with e-tendering was 0.005 which is an indication that e-tendering as an electronic procurement practice is statically significant since it is below the critical p value of 0.05 at 95% confidence level. E-approvals and quality are positively and significantly related, ($t=2.559$, $p=0.015$) an indication that a unit increase in the implementation of e-approvals results

in a related increase in quality of goods and services by 0.391, and the related p-value is 0.015 which is an indication that e-approvals as an electronic procurement practice is significant since it is below 0.05 at 95% confidence level. E-payments and quality are positively and significantly related, (t=0.559, p=0.552) an indication that a unit increase in the implementation of e-payments results in a related increase in quality of goods and services by 0.069, and the related p-value is 0.552 which is an indication that e-payments as an electronic procurement practice is statically insignificant since it is above the critical p value of 0.05 at 95% confidence level. Hence implementation of electronic procurement has improved the quality of goods in INGO's in Nairobi.

4.4.2 Model Summary

Table 4.7 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.652 ^a	.425	.351	.58551

a. Predictors: (Constant), e-requisition, e-sourcing, e-tendering, e-approvals, e-payments

Source: Research Data (2018)

The findings indicated a correlation coefficient value of 0.652 and R value of 42.5%. R squared value is 43% meaning that 43% of the variations in quality is explained by the variation in the independent variables: e-requisitioning, e-sourcing, e-tendering, e-approvals, e-payments. This is due to unexplained variance which is due to factors not in the model and pure chance occurrence is only 27%, indicating that this is a very good model ($R^2 > 70\%$).

4.4.3 ANOVA Table

Table 4.8

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	9.874	5	1.975	5.761	.000 ^b
	Residual	13.370	39	.343		
	Total	23.244	44			

a. Dependent Variable: Timeliness

b. Predictors: (Constant), e-requisition, e-sourcing, e-tendering, e-approvals, e-payments

Source: Research Data (2018)

The results on the analysis of the variance (ANOVA) indicate that the overall model was statistically significant since the p-value is less than 0.05. Further, the results imply that the independent variables are good predictors of supply chain performance. This was supported by an F statistic (calculated) of 5.761 which is greater than F-critical of 2.61 and the reported p value (0.000) which was less than 0.05.

4.5 Effect of Electronic Procurement on Cost as a Global Supply Chain Performance

The second objective of the study was to ascertain the effect of implementation of electronic procurement on cost as global supply chain performance measure in INGO's in Nairobi. The study adopted use of multiple regression on all the global supply chain performance, measures as indicated below:

4.5 1 Coefficients

Model	Unstandardized Coefficients			Standardized Coefficients	T	Sig.
	B	Std. Error	Beta			
(performance)	7.055	.714			9.882	.000
e-requisitioning	.104	.049	.148		1.653	.081
E-sourcing	.341	.058	.515		5.554	.000
E-tendering	.150	.073	.254		2.053	.049
E- approvals	.291	.060	.326		3.661	.001
E-payments	.331	.060	.527		5.554	.000

a. Dependent Variable: Cost reduction
b. Predictors: (Constant), e-requisition, e-sourcing, e-tendering, e-approvals, e-payments

Source: Research Data (2018)

The results show that e-requisitioning and cost are positively and insignificantly related ($t=1.653$, $p=0.081$). This indicates that an increase in the level of adoption of e-requisitioning by one unit, results to related increase in cost savings of products and services offered by 0.104. Besides e-requisitioning had 0.081 p- value an indication that e-requisitioning is not statically significant at 0.05 critical value since it is more than 0.05. e-sourcing and quality are positively and insignificantly related ($t= 5.554$, $p=0.000$) which is an indication that an increase in the implementation of. e-sourcing by one unit, results in a related increase in cost savings by 0.053 all other factors held constant. The p-value of 0.000 is lower than 0.05 and hence. e-sourcing is significant.

E-tendering and quality are positively and significantly related, ($t=2.053$, $p=0.049$) which indicates that implementation of e-tendering leads to an improvement in cost savings and services by 0.150. The p-value associated with e-tendering was $p= 0.049$ which is an indication that e-tendering as an electronic procurement practice is statically significant since it is below the critical p value of 0.05 at 95% confidence level. E-approvals and quality are positively and significantly related,

($t=3.661$, $p=0.001$) an indication that a unit increase in the implementation of e-approvals results in a related increase in quality of goods and services by 0.291, and the related p-value is 0.001 which is an indication that e-approvals as an electronic procurement practice is statically significant since it is below the critical p value of 0.05 at 95% confidence level. E-payments and quality are positively and significantly related, ($t=5.554$, $p=0.000$) an indication that a unit increase in the implementation of e-payments results in a related increase in cost reduction and services by 0.331, and the related p-value is 0.000 which is an indication that e-payments as an electronic procurement practice is significant since it is above the critical p value of 0.05 at 95% confidence level.

4.5.2 Model Summary

Table 4.10 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.856 ^a	.733	.681	.35692

a. Dependent Variable: Cost reduction

b. Predictors: (Constant), e-requisition, e-sourcing, e-tendering, e-approvals, e-payments

Source: Research Data (2018)

The findings indicated a correlation coefficient value of 0.856 and R value of 73.3%. R squared value is 73% meaning that 27% of the variations in quality is explained by the variation in the independent variables: e-requisitioning, e-sourcing, e-tendering, e-approvals, e-payments. This is due to unexplained variance which is due to factors not in the model and pure chance occurrence is only 27%, indicating that this is a very good model ($R^2 > 70\%$).

4.5.3 ANOVA Table

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	19.898	39	1.809	14.200	.000 ^b
	Residual	7.261	5	.127		
	Total	27.159	44			

a. Dependent Variable: Cost reduction

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

The results on the analysis of the variance (ANOVA) indicate that the overall model was statistically significant since the p-value is less than 0.05. Further, the results imply that the independent variables are good predictors of supply chain performance. This was supported by an F statistic (calculated) of 14.200 which is greater than F-critical of 2.61 and the reported p value (0.000) which was less than 0.05.

4.6 Effect of Electronic Procurement on Responsiveness as a Global Supply Chain Performance Measure

4.7.1 Coefficients

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	3.875	.797		4.863	.000
e-requisitioning	.613	.133	-.573	4.617	.000
E-sourcing	.135	.103	.159	1.310	.198
E-tendering	.265	.102	.318	2.585	.014
E- approvals	.185	.109	.205	1.706	.096
E-payments	.188	.163	.139	1.152	.257

a. Dependent Variable: Responsiveness

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

The results show that e-requisitioning and responsiveness are positively and insignificantly related ($t=4.617$, $p=0.000$). This indicates that an increase in the level of adoption of e-requisitioning by one unit, results to related increase in the responsiveness by 0.613. Besides e-requisitioning had 0.00 p- value an indication that e-requisitioning is statically significant at 0.05 critical value since it is less than 0.05. e-sourcing and responsiveness are positively and insignificantly related ($t=1.310$, $p=0.198$), an indication that an increase in the implementation of e-sourcing by one unit, results in a related increase in quality by 0.135 all other factors held constant. Besides, the t test value attained was 0.198. The p-value of 0.714 is greater than 0.05 and hence e-sourcing is statically insignificant.

E-tendering and responsiveness are positively and significantly related, ($t=2.585$, $p=0.014$) which indicates that implementation of e-tendering leads to an improvement in quality of goods and services by 0.265. The p-value associated with e-tendering $p= 0.005$ which is an indication that e-tendering as an electronic procurement practice is statically significant since it is below the critical $p=0.05$ at 95% confidence level. E-approvals and responsiveness are positively and significantly related, ($t=,0.096$) an indication that a unit increase in the implementation of e-approvals results in a related increase in responsiveness by 0.185, and the related p-value is 0.185 which is an indication that e-approvals as an electronic procurement practice is statically significant since it is below the critical p value of 0.05 at 95% confidence level. E-payments and responsiveness are positively and significantly related, ($t=1.152$, $p=0.257$) an indication that a unit increase in the implementation of e-payments results in a related increase in responsiveness by 0.069, and the related $p= 0.552$ which is an indication that e-payments as an electronic procurement practice is statically insignificant since it is above the critical p value of 0.05 at 95% confidence level.

4.6.2 Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.720 ^a	.519	.471	.52871

a. Dependent Variable: Responsiveness

b. Predictors: (Constant), e-requisition, e-sourcing, e-tendering, e-approvals, e-payments

Source: Research Data (2018)

The findings indicated a correlation coefficient value of 0.720 and R value of 51.9%. R squared value is 52% meaning that 48% of the variations in quality is explained by the variation in the independent variables: e-requisitioning, e-sourcing, e-tendering, e-approvals, e-payments. This is due to unexplained variance which is due to factors not in the model and pure chance occurrence is only 27%, indicating that this is a very good model ($R^2 > 70\%$).

4.6.3 ANOVA Table

ANOVA^a

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	12.063	4	3.016	10.789	.000 ^b
Residual	11.181	40	.280		
Total	23.244	44			

a. Dependent Variable: Responsiveness

b. Predictors: (Constant), e-requisition, e-sourcing, e-tendering, e-approvals, e-payments

Source: Research Data (2018)

The results on the analysis of the variance (ANOVA) indicate that the overall model was statistically significant since the p-value is less than 0.05. Further, the results imply that the independent variables are good predictors of supply chain performance. This was supported by an F statistic (calculated) of 10.789 which is greater than F-critical of 2.61 and the reported p value (0.000) which was less than 0.05.

4.7 Effect of Electronic Procurement on Timeliness

4.7.1 Coefficients

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	4.559	.607		7.511	.000
e-requisitioning	.677	.124	.633	5.445	.000
E-sourcing	.258	.103	.310	2.497	.017
E-tendering	.158	.108	.174	1.465	.151
E- approvals	.164	.163	.122	1.002	.322

a. Dependent Variable: Timeliness

b. Predictors: (Constant), e-requisition, e-sourcing, e-tendering, e-approvals, e-payments

Source: Research Data (2018)

The results show that e-requisitioning and timeliness are positively and significantly related ($t=5.445$, $p=0.000$). This indicates that an increase in the level of adoption of e-requisitioning by one unit, results to related increase in the timeliness in delivery of goods and services by 0.677. Besides e-requisitioning had $p=0.000$ an indication that e-requisitioning is statically significant at 0.05 critical value since it is less than 0.05. e-sourcing and timeliness are positively and insignificantly related ($t=2.497$, $p=0.017$) which is an indication that an increase in the implementation of e-sourcing by one unit, results in a related increase in timeliness by 0.258 all other factors held constant. Besides, the $p=0.017$ which is less than 0.05 and hence e-sourcing is significant.

E-tendering and timeliness are positively and insignificantly related, ($t=1.465$, $p=0.151$) which indicates that implementation of e-tendering leads to an improvement in reliability of the INGO's by 0.158. The p-value associated with e-tendering was 0.151 which is an indication that e-tendering as an electronic procurement practice is statically insignificant since it is below the critical p value of 0.05 at 95% confidence level. E-approvals and timeliness are positively and significantly related, ($t=1.465$, $p=0.322$) an indication that a unit increase in the implementation of

e-approvals results in a related increase in timely delivery of goods and services by 0.391, and the related $p=0.015$ which is an indication that e-approvals as an electronic procurement practice is statically significant since it is below the critical p value of 0.05 at 95% confidence level. E-payments and timeliness are positively and significantly related, ($t=0.1002$, $p=0.332$) an indication that a unit increase in the implementation of e-payments results in a related increase in timeliness by 0.164, and the related $p=0.332$ which is an indication that e-payments as an electronic procurement practice is statically insignificant since it is above the critical p value of 0.05 at 95% confidence level.

4.7.2 Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.677 ^a	.458	.389	.56826

a. Dependent Variable: Timeliness

b. Predictors: (Constant), e-requisition, e-sourcing, e-tendering, e-approvals, e-payments

Source: Research Data (2018)

The findings indicated a correlation coefficient value of 0.677 and R value of 46%. R squared value is 46% meaning that 44% of the variations in quality is explained by the variation in the independent variables: e-requisitioning, e-sourcing, e-tendering, e-approvals, e-payments. This is due to unexplained variance which is due to factors not in the model and pure chance occurrence is only 27%, indicating that this is a very good model ($R^2 > 70\%$).

4.7.3 ANOVA Table

ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	10.651	5	2.130	6.596	.000 ^b
	Residual	12.594	39	.323		
	Total	23.244	44			

a. Dependent Variable: timeliness

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

Source: Research Data (2018)

The results on the analysis of the variance (ANOVA) indicate that the overall model was statistically significant since the p-value is less than 0.05. Further, the results imply that the independent variables are good predictors of supply chain performance. This was supported by an F statistic (calculated) of 6.596 which is greater than F-critical of 2.61 and the reported p value (0.000) which was less than 0.05.

4.8 Barriers of Electronic Procurement Implementation

The respondents were asked to indicate the barriers experienced in the implementation of electronic procurement in INGO's in Nairobi. The responses were rated on a scale of (1) Not at all (2) Small extent (3) Moderate extent (4) Great extent (5) Very great extent.

The findings are indicated in the table below:

Barriers	Mean	Std. Deviation
High costs of implementation of e-procurement	3.9111	.66818
High costs of training staff	3.6000	1.00905
Resistance to change by staff	3.5778	.54309
Inadequate technological infrastructure	3.4444	.91839
Non supporting organizational culture	3.3333	.70711
Lack of performance measurement systems	3.2889	.72683
Lack of supplier interests or support	3.2667	1.03133
Lack of sound management program	3.2000	.94388
Poor communication mechanism	3.1556	.70568

Source: Research Data (2018)

The study findings indicated that to a moderate extent various barriers were experienced in the implementation of electronic procurement practices in INGO's in Nairobi: High costs of implementation of e-procurement indicated a mean value of 3.9111; High costs of training staff indicated a mean value of 3.6000; Resistance to change by staff indicated a mean value of 3.5778; Inadequate technological infrastructure indicated a mean value of 3.4444; Non-supporting organizational culture indicated a mean value of 3.3333; Lack of performance measurement systems indicated a mean value of 3.2889; Lack of supplier interests or support indicated a mean

value of 3.2667; Lack of sound management program indicated a mean value of 3.2000; Poor communication mechanism indicated a mean value of 3.1556. An indication that the INGO's in Nairobi to a moderate extent face various challenges in use electronic mode of procurement of goods and services.

4.9 Discussion

The main purpose of the study was to establish the extent of adoption of electronic practices in INGO's in Nairobi, its effect on global supply chain performance, and the barriers faced in the implementation of electronic procurement practices in INGO's in Nairobi. The findings of the study as indicated above ascertained that to a moderate extent, INGO'S in Nairobi have adopted electronic procurement practices in their global supply chain activities. This was indicated as per the results whereby descriptive analysis was carried out on every variable, resulting to all the five electronic procurement practices having mean values greater than three concluding that to a moderate extent of e-procurement implementation in INGO's in Nairobi. To establish the effect of electronic procurement practices on global supply chain performance of INGO's in Nairobi Kenya, the study used regression analysis to indicate the effect of the various electronic procurement management practices and on GSCP in INGO's in Nairobi Kenya. The multiple regression analysis established that 46% of quality, 73% of cost, 51% of responsiveness and 64% of timeliness as global supply chain indicators was affected by implementation of electronic procurement practices in INGO's in Nairobi. This concluded that the electronic procurement practices had great impact on the GSCP of the INGO's identified for the study. The ANOVA analysis indicated a 0.000 value as the significance level for all the four global supply chain performance indicators an indication that the models used were statistically significant since the values were less than 0.005 at 95% confidence level hence electronic procurement practices have impact on GSCP of INGO'S in Nairobi Kenya.

This study is in concurrence with a study carried out by Mukherejee, (2013) who examined e-procurement technologies in agro-based SME's in Malaysia, where he ascertained that the adoption e-procurement is affected by factors like cost and top management commitment. Quesada (2016) carried out a study on the effect of e-procurement on procurement practices and performance, the study findings indicated that there is a positive relationship between adoption

of e-procurement and performance of firms. Kagai (2013), studied on electronic procurement in private universities in Kenya indicated that adoption of electronic procurement leads to improved supply chain performance in the private universities in Kenya, it further established that resistance to change, lack of adequate funds and lack of adequate skills are the major challenges facing implementation of e-procurement in the private universities in Kenya. Kanana (2016) in her study on e-procurement implementation and performance of county governments in Kenya, ascertained that there was a positive impact between e-procurement implementation and supply chain performance in county governments. Similarly, a study by Ngeera (2016) on e-procurement management practices and performance of pharmaceutical firms in Nairobi ascertained that there exists a positive correlation between adoption of e-procurement practices and performance in pharmaceutical firms in Kenya. Finally, Onjala (2017) on his study research on the effect of adoption of electronic procurement and supply chain performance in dairy firms in Kenya established that implementation of e-procurement practices results to an improved level of supply chain performance of dairy firms in Kenya.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter includes the summary, conclusions, recommendations and limitations of the study. The study objectives were to find out the extent of electronic practices implementation in INGO's in Nairobi, to ascertain the effect of implementation of electronic procurement practices on global performance in INGO's in Nairobi.

5.2 Summary

The study was on electronic procurement and global supply chain performance of INGO's in Nairobi. The first objective of the study was to establish the extent of implementation of electronic procurement in INGO's in Nairobi. The second objective was to establish the impact of electronic procurement on global supply chain performance of INGO's in Nairobi. The study adopted use of descriptive research design in its methodology where data was collected by use of questionnaires from respondents who were procurement managers or their equivalent in various INGO's in Nairobi. A total number of sixty-four questionnaires were issued to respondents. The biographic information indicated that both male and female were well represented in the INGO's in Nairobi. Based on education background, the findings indicated that all the respondents had adequate education and were in a position to provide adequate information on the data sought by the respondents on electronic procurement practices

Based on the first objective of the study which was to ascertain the extent to e-requisitioning, e-sourcing-approvals, e-payments as electronic procurement practices had been implemented in the INGO's in Nairobi and their impact on global supply chain performance which was measured by timeliness, costs, quality and responsiveness. From the findings it was established that to a moderate to a large extent, all the five electronic procurement practices had been implemented in the INGO's as indicated by mean values that were three and above. Hence this is an indication that the INGO's are able to carry out their procurement practices in a cost efficient manner based on their implementation of electronic procurement.

The findings of the study on the second objective of the study which was on ascertaining the effect of implementation of electronic procurement on global supply chain performance indicated that

there exists a positive relationship between implementation of electronic procurement practices and global supply chain performance as indicated by positive coefficient values in the coefficient table from the multiple regression analysis results. Of the five measures of global supply chain performance, electronic procurement practices had greatest impact on cost, followed by timeliness, followed by quality and finally responsiveness. An indication the implementation of electronic procurement practices had the greatest impact on cost as a global supply chain indicator and hence the firms need to implement electronic procurement management practices to ensure that they are in a position to achieve high levels of costs savings through cost reduction.

5.3 Conclusion

INGO's are of major importance in our economy based on their key role in provision of funding for various projects which are beneficial to the economy through provision funds to the poor and the disadvantaged through projects like building of schools, water projects, health care, among others. They offer employment opportunities in their various projects hence improving living standards of people. To achieve timeliness in delivery of goods and services to the customers at the lowest and at affordable prices, there is need for implementation of electronic procurement. It helps in high cost savings, through timely deliveries of goods and services to the customers, and high transparency in the procurement process which helps in the cutting of unnecessary costs due to corruption. Effectiveness in operations of a firm is highly attributed to the manner in which it manages its procurement process and adoption of electronic procurement is key in achieving this. In conclusion, the study was aimed at establishing the extent to which electronic procurement had been implemented in the INGO's and the effect of electronic procurement practices on global supply chain performance of INGO's in Nairobi

Based on the findings we can conclude that on a moderate extent, electronic procurement practices have been adopted by INGO's in Nairobi. This facilitates their ability to procure goods and services on a time in a cost efficient way. This was indicated by findings from descriptive statics which indicated to a moderate extent all the practices had been implemented and hence the procurement of goods and services in the INGO's is done in cost efficient manner. Quality, timeliness, cost and responsiveness as global supply chain performance measures were affected by a high margin by implementation of electronic procurement practices in INGO's from the multiple regression

findings. The regression models used indicated that generally electronic procurement practices were statically significant and good indicators of global supply chain performance based on the fact that the p-value got in the ANOVA tables was less than 5% at 95% confidence levels.

5.4 Recommendations to Policy and Practice

The world has become a global village due to the adoption of ICT in the day to day operations of a firm. Adoption of ICT in various operations is key in the achievement of world class performance and which is achieved through high global performance. A firm's success in its operations is highly attributed to the proper adoption and execution of its procurement through adoption of electronic procurement practices which are key to the attainment of improved performance due to reduced costs of operations. From the study findings some INGO's had implemented the electronic procurement practices to a moderate extent. The procurement had implemented electronic procurement practices to a moderate extent while others had implemented them to a small extent. There is need for availing adequate training on the implementation of electronic procurement practices to facilitate the ability of various INGO's to achieve improved global supply chain performance. The management of various INGO's in Nairobi need to manage the various challenges that they faced in the implementation of electronic procurement practices to facilitate their ability to achieve improved global supply chain performance in their operations. There is need for the management to incorporate the electronic procurement practices into their system in order to improve their performance and competitiveness.

5.5 Limitations of the Study

The major limitation of the study was that the INGO's being studied were only in based in Nairobi County this was a narrow focus in terms of scope as during the study it was established that a number of INGO's operate outside Nairobi county. Another limitation was the GSCP being studied were constrained to four i.e. Quality; Cost; Time and Responsiveness. Another limitation was on data collection whereby the respondents were unwilling to fill out the questionnaires based on fear of job security and that they were working under strict guidelines and would not participate in the study. In addition, the study solely focused on the INGO's and not both the local and local NGO's. It was solely limited on how implementation of electronic procurement practices affects global supply chain performance.

5.6 Suggestions for further Research

Since the area of study was primarily based on electronic procurement practices and their impact on global supply chain performance, further research can be conducted to establish the relationship of technology in procurement and other dimensions of performance like organization and leadership. Irrespective of the research attaining its objective, the study concludes that this was a cross sectional study of electronic procurement practices only. Based on the various global supply chain performance indicators there were unexplained variances in the four model summary with respect to quality, costs, timeliness and responsiveness. There is need for further studies on what the unexplained variables are and how they can be managed in a firm to ensure improved global SC performance in INGO's in Nairobi. A further research needs to be done on procurement practices as a whole other than electronic procurement practices only which are part of procurement practices. Further studies need to be carried out on both the local and international NGO's in other areas other than Nairobi alone.

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APPENDIX 1: Questionnaire

This questionnaire is intended to provide information for the study on e-procurement responsiveness to supply chain Performance in International non-governmental organizations in Nairobi. 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. Kindly indicate your age category:

25 - 30 Years

31 - 34 years

35 – 40 years

41 – 44 years

45 – 50 years

Over 51 years

3. Level of Education Attained

Primary

Secondary

Technical / Vocational

Undergraduate

Postgraduate

4. Work experience (Years)

Less than 5 years

5-10 years

Over 10 years

SECTION B IMPLEMENTATION OF E-PROCUREMENT PRACTICES

Please indicate whether your firm 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 extent 3-Moderate extent 4-Great extent 5-Very great extent

PRACTICE	1	2	3	4	5
e-Requisitioning					
Requisitions by staff are made by the staff online					
Specifications of items ordered is made online					
e-Sourcing					
The firm identifies new suppliers through the internet					
Suppliers submit bids over internet					
e-Tendering					
The firm sends requests for quotations to suppliers online					
The firm receives responses from suppliers online					
e-Approval					
Approvals for requisitions are done online					
Posting item specifications is done online					
e-Payments					
Invoices are receives by the firm through the internet					
The firm makes supplier payments electronically					

SECTION C: SUPPLY CHAIN PERFORMANCE

Indicate the extent to which e-procurement practices has affected your organizations global supply chain performance i.e. quality, time, cost, delivery and responsiveness.

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

PRACTICE	1	2	3	4	5
Quality					
To what extent has e-requisitioning implementation resulted to improved quality of goods and services procured					
To what extent has e-sourcing implementation resulted to improved quality of goods and services procured					
To what extent has e-tendering implementation resulted to improved quality of goods and services procured					
To what extent has e-approval implementation resulted to improved quality of goods and services procured					
To what extent has e-payments implementation resulted to improved quality of goods and services procured					
Cost					
To what extent has e-requisitioning implementation resulted to reduction in procurement costs					
To what extent has e-sourcing implementation resulted to reduction in procurement costs					
To what extent has e-tendering implementation resulted to reduced procurement costs					
To what extent has e-approval implementation resulted to reduced procurement costs					
To what extent has e-payments implementation resulted to reduced procurement costs					
Responsiveness					
To what extent has e-requisitioning implementation resulted to improved supply responsiveness to customer requirements					
To what extent has e-sourcing implementation resulted to improved supply responsiveness to customer requirements					
To what extent has e-tendering implementation resulted to improved supply responsiveness to customer requirements					
To what extent has e-approval implementation resulted to improved supply responsiveness to customer requirements					

To what extent has e-payments implementation resulted to improved supply responsiveness to customer requirements					
Time					
To what extent has e-requisitioning implementation resulted to reduced lead time in procurement hence timely supplies					
To what extent has e-sourcing implementation resulted to reduced lead time in procurement hence timely supplies					
To what extent has e-tendering implementation resulted to reduced lead time in procurement hence timely supplies					
To what extent has e-approval implementation resulted to reduced lead time in procurement hence timely supplies					
To what extent has e-payments implementation resulted to reduced lead time in procurement hence timely supplies					

SECTION D: BARRIERS OF E-PROCUREMENT PRACTICES IMPLEMENTATION

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

Key:

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

Barrier	1	2	3	4	5
High costs of implementation of e-procurement					
High costs of training staff					
Resistance to change by staff					
Inadequate technological infrastructure					
Non supporting organizational culture					
Lack of performance measurement systems					
Lack of supplier interests or support					
Lack of sound management program					
Poor communication mechanism					

Any other barrier? Please indicate,

Thank you for your cooperation

APPENDIX II: List of International Non-governmental organizations in Nairobi

1. ADESO
2. ICRC
3. IFRC
4. ILRI
5. IOM
6. ACTED
7. Action against Hunger
8. Action Aid
9. AMREF
10. CAFOD
11. Care International
12. Caritas Switzerland
13. Catholic Relief Services
14. Child Fund Kenya
15. Christian AID
16. Christian Blind Mission
17. Christian Children Fund
18. Christian Mission Aid
19. Concern Worldwide
20. Danish Refugee council

21. Feed the children
22. Food for the Hungry
23. German Agro Action
24. Goal (K)
25. Handicap International
26. Help age International
27. Hire-Kenya Programme
28. Horn Relief
29. International Institute of Rural Reconstruction (IIRR)
30. International medical corps
31. International Rescue Committee
32. Islamic Relief
33. Kenya Red Cross
34. Lutheran World Federation
35. Merlin
36. Norwegian Refugee Council
37. Oxfam GB 38. Oxfam Novib
39. People in Aid
40. Plan International
41. Practical Action
42. Samaritan's Pulse Int'l Relief.

43. Save the Children
44. Solidarities
45. Tearfund
46. Transparency International
47. Trocaire Kenya
48. World Concern
49. World Vision International
50. FAO ROEA
51. FAO Kenya
52. OCHA 53. UN Habitat
54. UNAIDS 55. UNDP Kenya
56. UNEP
57. UNFPA
58. UNHCR Ken
59. UNHCR RSB
60. UNICEF ESARO
61. UNICEF Kenya
62. UNWOMEN
63. WFP
64. WHO

NGO BOARD, (2018)