EFFECTS OF ELECTRONIC PROCUREMENT ON SUPPLY CHAIN PERFORMANCE IN FOOD MANUFACTURING FIRMS IN NAIROBI COUNTY, KENYA

ASEKA TRUPHOSA-15/01595

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MASTER OF SCIENC (FINANCE AND INVESTMENT) OF KCA UNIVERSITY

OCTOBER 2019

DECLARATION

Declaration by the Student

I declare that this project is my original work and has not been previously published or submitted elsewhere for a ward of a degree. I also declare that this contains material written or published by other people except where due reference is made, and author acknowledged.

Aseka Truphosa **Reg. No. 15/01595**

Sign: …….……..…… Date: …….……....

I do hereby confirm that I have examine the Master's project of Aseka Truphosa and have approved it for Examination

Sign: …….……..…… Date: …….……....

Mr. Mackred Ochieng Dinga

Dissertation Supervisor

ACKNOWLEDGEMENT

I would like to extend my sincere gratitude to my supervisor Mr. Mackred Ochieng for his wise counsel, encouragement and constructive suggestions. His interest in the progress and commitment towards this study made this work come to completion. My heartfelt appreciation also goes to my family for making my dreams come true through their moral support during my studies. Lastly, I acknowledge the respondents from the food manufacturing firms who will commit their time in responding to the questionnaires during data collection.

DEDICATION

My appreciation to my mighty God who has given me the energy and will to pursue this course to the end. I also dedicate to my family that has stood by me against all odds until the end. Their unwavering support has been immense from the start to the end of these studies. God bless them all.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

ICTs	Information and Communication Technologies
RFQs	Request for Quotations
SC	Supply Chain

ABSTRACT

Through digitizing of information and data, and opportunities that are provided by the internet, it creates a foundation to rationalize and improve efficiency in the processes of administration of the organization. Based on the character of product and service, e-procurement may not suit all goods where there is need for a very strong association between the buyer and the supplier. This established the effects of e-procurement on supply chain (SC) performance in food manufacturing firms in Nairobi City County. The study specifically sought to determine the effect of tendering, e-invoicing and e-payment on SC performance in food manufacturing firms. The methodology guiding the study constituted descriptive research design; the target population was selected 78 staff from the food manufacturing firms. The sampling design was census. The data collection techniques involved questionnaires while data was analyzed quantitatively aided by SPSS software. The presentations of findings involved use of frequency distribution tables and graphs. The study found that e-tendering significantly and positively related with SC performance in food manufacturing firms; e-invoicing significantly and positively related with SC performance in food manufacturing firms; and e-procurement significantly and positively related with SC performance in food manufacturing firms. The study recommends management of the food manufacturing companies should ensure that the technological architecture used in electronic procurement is compatible; management of the firms should have financially viable e-invoicing solution through creation of critical mass through alliance partners an providers of technology to add the necessary desirables of e-invoicing adding necessary invoicing; Also, management of the firms should integrate e-payment in their business transactions.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The process whereby systems that apply the use of the internet are used in daily procurement activities in all the stages of the process from searching, sourcing, negotiating, ordering, receipt ad post purchase review is what is referred to as E-Procurement (Baldrige & Burnham, 2015). Chau and Tam (2012) elaborated on 3 various forms of systems of e-Procurement; buyer; and seller e- Procurement systems; and online intermediaries which includes he ones that focuses on a single stage or multiple in the process of procurement like the e-tendering, e-marketplace, e-auction/reverse auction, and e-catalogue.

The application of e-procurement can be seen in a broad view as a solution that is end to end integrating and streamlining several processes of procurement in the entire company. Crenshaw and Davenport (2011) noted that purchasing contribute the highest to the spending of a company. Therefore, the advancement in the e-procurement that is based on the web has been heralded since it has the ability of lowering the overall cost of acquiring.

1.1.1 Concept of Electronic Procurement

E-Procurement is the process whereby integrated ICTs are used in carrying out some or the entire process of procuring which includes to search, source, negotiate, order, receive and reviews after purchases (Croom & Brandon-Jones, 2014). It is more than just making a decision to purchase online. its inclusive of connecting the seller and the staff of the company to a network of purchasing companies that uses the e-procurement

programs which allows them to purchase in several departments without doing away with individual control, lowers the rogue buying, acquire goods at a good price and products of good quality from variety of suppliers. E-procurement is an advantage to the supplier since they can be proactive in the processes of their business (Chau, 2013).

Berger and Calabrese (2015) states that e-procurement despite it being a key instrument in the procurement process, it's a new thing to several businesses worldwide; as time passes, it is being applied by many managers and practitioners because they have started to understand how important it is. Chan and Lu (2014) indicated that the paradigm of e-procurement has develops a very hug opportunity for manufacturing companies dealing with food to consolidate their processes of purchasing. through E-procurement there are several horizons that have been created for business management and processing and provides shareholders with several options to make a decision that is appropriate regarding procurement of various items such as engineering items, utilities or service.

1.1.2 Electronic Procurement and Supply Chain Management

The effect of technology that is based on the web adds some value and makes activities be done faster and improves avenues of management of supply chain in the current competitive environment. it is very important that clients be provided with solutions that are cost effective and costs of life cycle for value that is sustainable (Davenport, 2011). Organizations are under very high pressure to better how responsive they are and efficient in developing products, operating and transparency in utilization of resources. Fitzgerald (2013) indicated that businesses have been forced to change their forms of operation from traditional forms to e-procurement and SC philosophy that is virtual in transferring activities of the company to be automated.

In discussing the strategies of competitive strategies of purchasing required in this 21st century, Subramani (2014) indicated that companies that deal with manufacturing of food need to optimize on the use of technology that is based on the internet in all the processes in the business, and link supply chain members, fasten the process of transferring information, and lower those expenses that do not add value. The process of procuring has always involved manual processes which are slow and systematic that is slower in handling the transaction process in procurement (Kauffman (2011). B2B that are internet enabled improves the coordination between businesses which result in saving of cost incurred in transactions and sourcing of emerging competitive opportunities for the company of the buyer (Shaw, 2014).

1.1.3 Supply Chain Management and Performance

Majority of the countries prefer e-procurement because they believe that it improves efficiency and provides businesses with better chances of reaching markets that are yet to be explored (Parmer, 2011). E-procurement has also enables organizations to lower their high spending on the cost they incur in manufacturing which positively impacted their profit levels in that with the help of the portals that are based on the web, most of the companies can post what they require with ease or RFQs using the internet and as a result they get suppliers quotation worldwide without hustling which provides them with variety of options to select from and it is cost effective (Stockdale, 2012).

Bateman (2012) indicated that automating SC process is advantageous and therefore should be adopted by every single company. With the introduction of internet, it has greatly contributed towards automating the process of procurement. Hyung (2012) also

indicted that the practices of SC can't better efficiency on their own because an efficient performance can be attained through interaction of different practices of SC.

1.1.4 E-Procurement in Manufacturing Firms

The e-procurement various food manufacturing firms is still adoption stage hence full benefits are yet to be achieved. The rate of adoption is low majorly due to stakeholders' reservations on the issue of online purchasing. In Kenya, a small number of companies have ICT infrastructure which is pre-requisite which is crucial in implementing e-procurement. Astronomic cost is being attributed to this which is involved in creating infrastructure and also the skill gap existing in the market (Kariko, 2015).

Hyung (2014) states that the GoK regards ICT to be a primary foundation in accomplishing vision 2030 whose aim is to change manufacturing and other sectors in the economy to facilitate the nation to transform into industrialized nation by 2030. According to Matunga (2013), in a business environment that is competitive and globalized, there is need for the businesses to stay at par with the developments in the world of technology and also manage lowering of costs incurred in operations and meet the goals and the objectives of the business. Shaw (2014) explained that e-procurement involves buying and selling of products, supplies and services using different channels like the electronic data.

Dza et al. (2013) argues that invoking economies of transaction cost in determining risks that relate with setting up the e-market mechanisms like opportunistic participants in the market and specificity of assets. The outcome depends on what the manufacturing company requires in committing some resources in deploying applications of IT and

infrastructure that is required in linking the internal processes of a business with the ones of platforms for trading. Fitzgerald (2013) emphasized that more complicated and idiosyncratic the linking integration is it makes it harder in transferring those connections with other platforms of trading or networks of trading pattern while conducting e-procurement.

1.2 Statement of the Problem

Through digitizing of information and data, and opportunities that are provided by the internet, it creates a foundation to rationalize and improve efficiency in the processes of administration of the organization (Chau & Tam, 2012). Through digitalizing of the administration and procurement procedures, for instance, the chance of establishing new and more work procedures that are efficient and communicating and cooperating in new techniques. However, Berger and Calabrese (2015) explain that based on the character of the product/service, e-procurement could not suit goods and services that have high specifications where there is a strong association between the buyer and the seller are essentials.

There are challenges in developing e-procurement system; this ranges from conversion of functionality of traditional systems that were based on paper to an environment that is electronic and maintain compliance that is legal and normal operations of the organization to take effect (Hines, 2014).).

Matunga (2013) in his study on impacts of practices of e-procurement on procurement that is effective Public Hospitals established that senior management see it as an issue where there is low compliance with inside clients either abuse or circumvent the systems of e-procurement. Gichuru (2012) studied critical success factors in business process

outsourcing of procurement services in companies in Kenya food manufacturing firms have been reluctant to adopt this new technology because of the financial resources involved, setting up of computers requires heavy inputs of investments both the physical structures and the employee skills. Esipisu and Tharaka (2012) studied the aspects of competitive E-tendering and contracting found that even to those who might have managed to set up these systems, they still suffer from formulating procurement procedures which cannot be sourced from within due to lack of internal expertise.

Therefore, in food manufacturing firms, adopting e-procurement platform constrains organization to make other investment since a chunk of massive resources has to be directed towards setting up of e-procurement platform, other notable hindrances in the success of e-procurement implementation have been the systems failure and security of the information. Where a loop hole exists, it has resulted in manipulation of the whole process either to favor personalized individuals or firms.

From the studies highlighted, there is lack of specific studies that addresses fewer studies electronic procurement on supply chain management in food manufacturing firm resulting in research gap. This calls for a need to undertake a research to fill the gap by carrying out a study on the effect of electronic procurement on supply chain performance.

1.3 Objectives

The following constituted the general and specific objectives

1.3.1 General Objectives

To evaluate the effects of electronic procurement on supply chain performance in food manufacturing firms in Nairobi City County, Kenya.

1.3.2 Specific Objectives

i. To examine the effect of e-tendering on supply chain performance in food manufacturing firms.
ii. To establish the effect of e-invoicing on supply chain performance in food manufacturing firms.
iii. To determine the effect of e-payment on supply chain performance in food manufacturing firms.

1.4 Research Questions

i. How does e-tendering affect supply chain performance in food manufacturing firms?
ii. To what extent does e-invoicing affect supply chain performance in food manufacturing firms?
iii. What effect does e-payment have on supply chain performance in food manufacturing firms?

1.5 Justification of the Study

Key reasons for the adoption of e-procurement by manufacturing firms is increasing productivity, providing visibility in daily transactions and making it easy for users to acquire the supplies they require. Matunga (2013) opines that it is a hard road for e-procurement since implementing is challenging and it takes time for managers of business and departments that deal with procurement to embrace it fully. Despite e-procurement systems being efficient and effective in terms of cost, there are other notable hindrances to their success and hey include systems failure and security of the

information. Where a loop hole exists, it has resulted in manipulation of the whole process either to favor of personalized individuals or firms. In line with this highlighted challenges, this study aimed at determining effects of e-procurement on SC performance in food manufacturing firms in Nairobi City County, Kenya.

1.6 Significance of the Study

1.6.1 Policy Makers in Food manufacturing firms

The study will challenge the management of food manufacturing firms towards investing and using the Information technology systems in procurement operations. Incorporating e-procurement in purchasing and supply function enables the companies to carry out simplified purchases and which is also secured and safe. The study will highlight various benefits that are bound to be experienced when using these systems in improving purchasing process. Therefore, the research study will come in handy to enable the management speed up adoption of ICT to facilitate effective usage of e-procurement to enhance performance of supply chain.

1.6.2 Other Firms

The management of other related firms will find this research study useful upon its completion. The researcher will consolidate various contributions from those who will participate in the study, thus, variety of opinion will be brought together and analysis will be done from the collected data to extract useful information regarding electronic procurement. The ideas will provide a substantive base regarding e-procurement to the organizations that is seeking to invest in e-procurement. Other companies that have not implemented e-procurement will also be able to see the benefits and implement the technology so as not to be disadvantaged during e-procurement operations.

1.6.3 Employees

The study will be beneficial to the employees as the electronic system will reduce the amount of paperwork to be filled. This will help in having spacious offices due to reduced paperwork. Spacious job settings are known to facilitate creativity among employees which will be used in resolving the workplace operations. Organizations implement systems into operations to obtain a competitive advantage and increase the productivity of the employees thus upgrading the company and increasing on the quality of the human capital. Similarly, it enlightens them on the best way to utilize their limited resources concurrently paying attention to factors that have a greater likelihood of affecting implementation and use e-procurement.

1.6.4 Other Researchers

Researchers will benefit as they will analyze ad understand the association between different factors that are studied, they will add to their knowledge in collection, analyzing and interpretation of raw data to data that is meaningful and prepare research reports that are presentable and acceptable when there is need for one. The findings will also enable the researcher to better their skills by investigating the diverse fields.

1.7 Scope of the Study

The study majored on examining the effects of electronic procurement on supply chain performance in food manufacturing firms in Nairobi City County, Kenya. The study targeted selected food manufacturing firms in Industrial Area in Nairobi that have implemented E-Procurement. The population of study was employees involved in supply chain management. The study was undertaken in a period of five months to its completion.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this chapter, an overview was provided on existing literature on electronic procurement and supply chain management. The chapter specifically focused on theoretical review, empirical review, and the Conceptual Framework.

2.2 Review of Theoretical Literature

This research study was anchored on the following theories; Innovation Diffusion Theory, Instrumental Theory and Concept of Acceptance Theory which are discussed on the following subsection.

2.2.1 Innovation Diffusion Theory

Developed by Rogers (1962), the innovation diffusion theory explains how a new idea, predictor innovation is adopted in a social system. Accordingly, some people adopt the innovation faster than others. They have an insatiable interest in new ideas and would, therefore, adopt the new ideas without being compelled to do. Early adopters are opinion leaders. They enjoy leading and appreciate new opportunities. The early majority adopt the new ideas earlier than the average person. Before they adopt a new idea, they must ascertain that it works. Success stories concerning the innovation motivate them to adopt it.

The late majority is also skeptical and would, therefore, only adopt a new innovation after it has been tested by majority. Laggards are conservative and hence averse to change. Although the adoption of Electronic Procurement brings uncertainty, it is prudent for the organizations to be aware of the advantages and risks of such innovation. Rogers (1962)

advanced that the timing of innovation adoption does influence the market share commanded by the organization. The attributes suggested include observability, complexibility, compatibility, trialability and relative advantage.

Many studies have shown that perceived benefits greatly impact Electronic Procurement adoption (Donnellan, 2013). One of the limitations of this theory is that it does not consider social support or individual resources. This theory suggests that players in the manufacturing industry must perceive the benefits associated with Electronic Procurement implementation and must aim to counter all possible challenges. This would specifically influence the management's support. If the top management and other key stakeholders have perceived the associated benefits and are committed to support the implementation process, the project will succeed.

2.2.2 Instrumental Theory

In the year 1991, Mary Tiles' and Hans Oberdiek's developed this theory based on the knowledge and ingenuity that was developed at Intel and in Silicon Valley from 90s. This theory provides a wide view of technology that is accepted. The basis is the concept that technology is a tool that stands ready to service their clients. It is agreed that technology is "neutral," excluding evaluating its own content. The idea implies that technology is indifferent in various ways in which it can be applied to achieve (Meredith, 2011). Therefore, neutral technology has some substantial value that is saved and is special neutrality case.

Transferring technology in the contrary is seen to be affected cost. Universality and rationality are the characteristics that are attributed to neutral nature of socio-political technology. This means that the basis of technology is proposition of verifiable. As far as

propositions hold, they aren't related in any way but just like scientific ideas, they maintain their state of cognition in any social context that is conceivable. Therefore, what has been found to perfectly work in a particular environment is also expected to work in another environment. When a technology is said to have universality it means that the same standard of measures can be used in a different setting. Therefore, it's said frequently that technology results to an increase in labor productivity in various areas.

Technology is considered to be neutral mainly because it stands on efficiency norm in boosting e-procurement in any and every context technology is said to be neutral (Ngai & Wat, 2014). The theory was relevant since managers impose new IT system in staff members without conducting any study on their reaction on the system whether staffs have the ability of adapting with ease and applying it in e-procurement and management of SC.

2.2.3 Concept of Acceptance Theory

This theory by Dillon and Morris, (1996) indicates that it is the will of the users to adopt IT in performing their duties which it has been created to support. Therefore, the idea that it is not being applied in instances where the users claim that they won't apply it without a proof of its use, or using the technology for the purpose it was designed for (like using internet connection for entertainment at work), there's some level of fuzziness because the actual usage has a likelihood of deviating from idealization, planned usage, but thus this theory indicates that such deviations aren't significant; it's the process of user acceptance of any IT for the purpose it is intended whose modeling and prediction can be done (Bagozzi&Warshaw, 2012).

Lacking acceptance from the users greatly affects successfulness of new information systems, clients are not willing to apply information systems in use resulting to impressive gains in performance. Thus, acceptance by users is regarded as a pivotal factor to determine successfulness or failure of projects of information system (Bagozzi&Warshaw, 2012).

In this study, managers and key Electronic Procurement implementation team ought to understand the external variables amidst other influencers of Electronic Procurement implementation. The PU and PEOU should be well communicated so as to overcome negative attitude towards use and to inculcate positive behavior of intention to use the e-procurement system so as to obtain actual use of the technology.

2.3. Empirical Review

In this section the empirical reviews was covered where the contribution of various researchers who researched on various variables that have been adopted in this study.

2.3.1 E-Tendering and Supply Chain Performance

A study by Clarke (2011) evaluated drivers and barriers to e-tendering in the Ghana construction industry. It aimed to identify possible drivers and barriers of e-tendering. The focus group was composed of five experts in the Electronic Procurement field. Questionnaires were formulated from the focus group and administered through a web-based platform. It was found that reduced staff is one of the technique through which competitive advantage can be attained by lowering costs. Kauffman and Kriebel (2011) further supported those findings when he conducted a study and established that by implementing system e-tendering, it enables a supplier of steel to perform a project worth

multi-million pound using 20% of normal company's employees. In addition through e-procurement, a company is able to attain competitive advantage over their rivals.

Gunasekaran and Ngai (2011) carried a study to examine factors that influence the use of e-tendering among contractor firms in Malaysia. It focused on PEOU, attitudes and PU of e-tendering as well as the people's intention to use e-tendering. One hundred and seventy eight questionnaires were administered to personnel in construction companies in Malaysia. The study established that e-tendering is perceived to be useful within the Malaysian construction company and that is why managers and personnel in the industry have strong intention towards using it despite its challenges.

Makau (2014) carried out a study to investigate challenges that face the adoption of e e-tendering in the public sector in Kenya. According to this research study, the implementation of e-tendering would bring forth huge benefits for organizations in the public sector through improvement in transparency, efficiency and reduction costs. The study was carried out the Nairobi Water and Sewerage Company. The study used a sample size of 86 employees and data collection tool was questionnaire. There were four key challenges that were experience by the public sector in adopting e-procurement. They include technological challenges, the competence of employees in information and communication technology, legal framework that may at times hamper effective implementation of Electronic Procurement an inadequate managerial commitment to Electronic Procurement adoption.

A study conducted by Kangongo and Gakure (2013) sort to identify the impact of Electronic Procurement in the automobile industry in Kenya in the organizational, managerial, environmental and technical aspects. In the technical aspect, which also

referred to the technological aspect of Electronic Procurement, the findings indicated that incompatible technological architecture decreases the efficiency in operations on the Electronic Procurement infrastructure. This further decreases the speed of the systems, which further causes user frustration. He found out that technological compatibility issues significantly affected majority of the firms, whether in the automobile sector or any other sector (including the construction sector), especially because the internet is a driving factor in Electronic Procurement.

A study conducted by Mose, Njihia and Magutu (2013) sort to identify the most important success factors and challenges pertaining to Electronic Procurement. The focus was large scale food manufacturing firms. The location was in Nairobi, Kenya. The results identified that the lack of regular use of technology by the employees was one of the challenges affecting Electronic Procurement in Kenya. This means that employees are not ready to get out of their comfort zones. This challenge can be linked to another challenge identified as resistance to change. Employees were likely to use the traditional approaches of procurement that they were fond of using rather than embracing Electronic Procurement.

2.3.2 E-Invoicing and Supply Chain Performance

there are several benefits that accrue from E-invoicing and they include reduction of cost, simplification of process, reduced time of payment, great secure data and also it has several benefits to the environmental. Public authorities and other enterprises have confirmed after they have used them. Bakos (2012) did introduce cost of transaction and tried explaining the reason why Individual Corporation don’t perform transaction of

assets by themselves as one of the factors of cost of transaction that is incurred in conducting those activities.

Archer (2015) indicated that such as in the economies of transaction cost, infrastructure cost is lowered per transaction when there is an increase in volumes of transaction. In order to develop e-invoicing solution that is viable financially, there is need of the company to develop the crucial mass through value network of alliances and providers of technology in adding the needed desirables through financial SC for e-invoicing. A Value Network is said to be a web of associations generating value by compacted exchange of dynamics between individuals groups or even organizations.

Burn and Robins (2013) elaborated in their study that models of value network do mediate organizations by value creation using three various forms of activities which are management of contracts and promotion of networks; provision of services; and operating infrastructure. In network organization clients get the opportunity to get direct access to one another or access indirectly a common pool which is a plan for savings and loans which is possible by mediation practices performed by the organization. The characteristics of the network are the key drivers for both value and cost.

Barratt and Rosdahl (2012) indicated that easy searching and transparency is an advantage to the customer. Economies of supplier search and SCM e-marketplace are the key factors that lower the cost of SCM and are elaborated using 3 dimensions: reduction of unit cost; streamlining of operations and increasing efficiency. Croom and Johnson (2013) explained three key elements of internal performance of services as conformance of processes, cost in terms of efficiency and expenditure and satisfaction of customers internally.

Number of access points, accessed users, and various links existing between clients are what determine values and cost. Users incur the cost when they access and make use of the network and value is established using the probability that it will reach a great percentage of relevant clients through the various linkages. Network can ensure they are of great value to their clients by increasing the range of services they provide by introducing other services adding to already set contracts and infrastructure or widen their pool of clients (Carter & Belanger, 2015).

The contribution of e-procurement to performance of SC can be highlighted by explaining the association among those processes as; Partner relationships, information sharing, and SC integration which are said to be the processes connecting systems of e-procurement and the performance of SC. Because e-procurement is a system that is based on technology, its impact can be inferred through technological applications related with management of SC (Presutti, 2013).

2.2.3 E-Payment and Supply Chain Performance

The number of manufacturing companies trying to streamline financial flows as part of improving efficiency in SC is on the rise, and therefore it lowers the cost of processing and in turn increases profitability. Companies can rejoice because the processes of transaction can be bettered with ease by use of payment platforms and technology that are existent (Matunga, 2013).

Esipisu and Tharaka (2012) indicated that firms dealing with manufacturing, source materials from the world which are being shipped thousands of miles for manufacturing and distribution to sales sites globally. Complicated systems for SC make it possible for large firms to manage the process in a manner that is cost effective. Professor Warren

Hausman from the Department of Management Science and Engineering at Stanford University, indicated that organizational success is dependent on on the performance of SC as the manufacturer are the end product.

Cheng (2010) stated that e-payment is an area that is growing fast globally and almost carry potential beyond measures. Clients are provided with benefits anytime, anywhere at a low cost. In addition it makes the world behave like a small village by reducing the distance between the buyer and seller (Porter, 2001). Up taking prepayment is affected by its ability of creating business value through awareness of its participants of potential advantages.

Fitzgerald (2013) revealed that the key reasons why firms regardless of its size take part in business are extracting some benefits from it. The same applied to E-payment. Standing (2011) indicated that there are more than 10 advantages of e-payment to the seller and the purchaser. Some of the advantages ids that it saves on cost, increases selling and buying process, exposes the business to new clients, it is convenient to users and provides transparency, improves quality of products and services, lower the need to office space and reduces the number of resources needed.

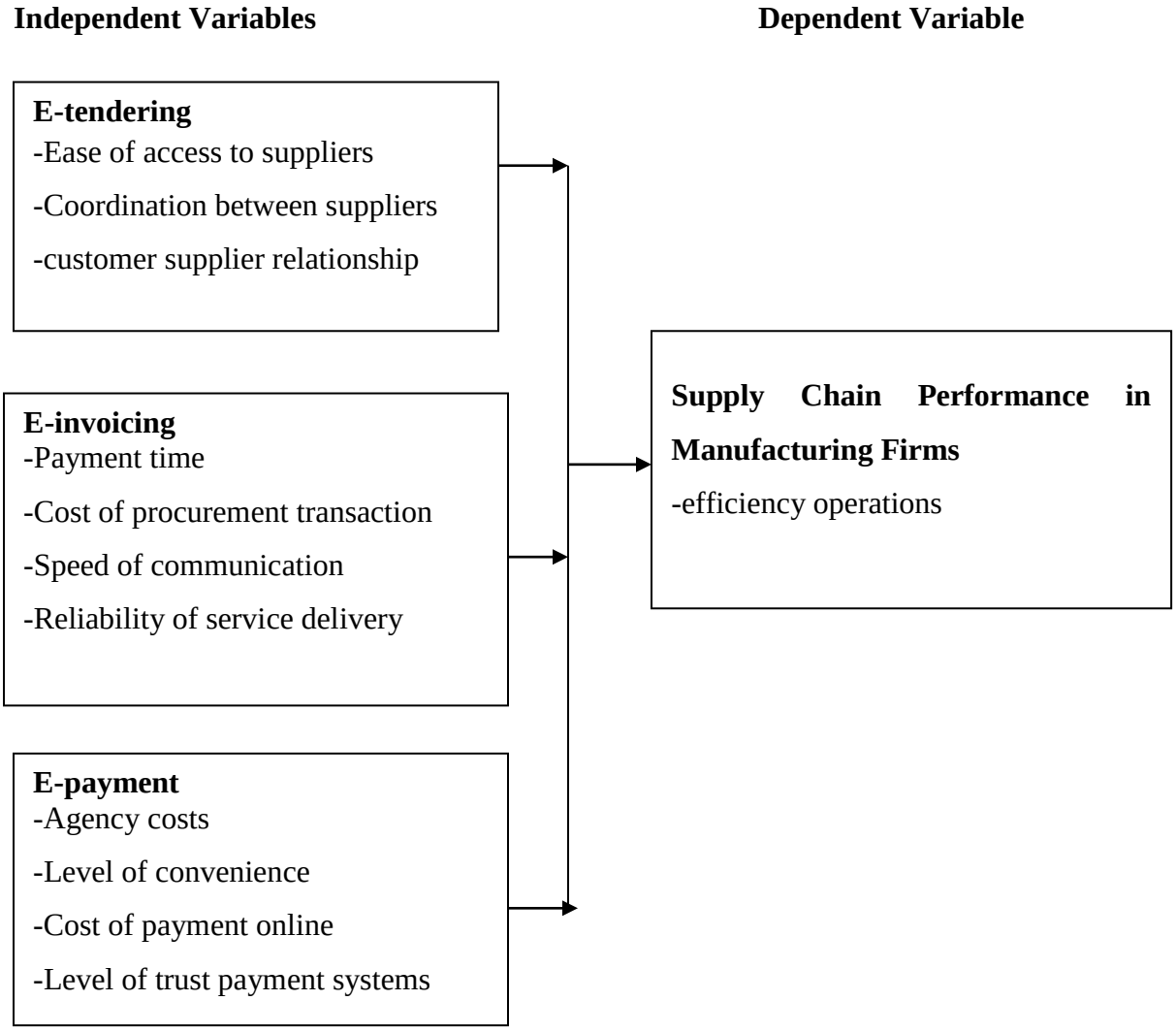
Developing IT and computer networks improve the use of e-payment and betters the application of SCM. The main focus of SCM is integrating planning, co-ordination and controlling all processes of logistical business and activities of SC in delivering value to consumers that is superior while incurring and at the same time satisfy what the shareholders require, like the interests of the clients, the government and the company itself. Completing implementation of SCM leads to fully integration and a much more effective SC which is more transparent and optimal allocation of processes of value addition.

Transactions are carried out in a place that is specifically virtual referred to as B2B e-marketplaces. Parmer (2011) who focused on moving procurement systems to the Internet established that E-marketplaces are among the highly heralded of developments recently. Through the marketplaces businesses are brought together purchasing and selling of goods and services in a buying community online. The proposition of e-marketplaces is increasing efficiency and effectiveness in procurement activities through the replacement of traditional processes with the ones that are automated and increasing the number of trading partners.

Wamego (2015) focusing on tackling graft in public procurement identified that the reliability and availability of software and hardware in Electronic Procurement is significant. If suppliers have challenges in trusting of using the software or hardware put in place, it leads to issues that significantly challenge the trust of the customers placed in the suppliers. This is why it is relevant to ensure that the information system put in place not only improves effectiveness, but it also efficient for both the suppliers and the customers.

2.4 Conceptual Framework

Conceptual Framework is made up of various variations and contexts. It's applied in making conceptual distinctions and organizing ideas to capture real things while doing it in an easy to remember and apply way (Scherer, 2010). In this study the dependent variable is SC performance in food manufacturing firms while the independent variables are e-tendering, e-invoicing and e-payment.



Source: Author (2018)

Figure 2.1: Conceptual Framework

2.4.1 E-tendering

The implementation of e-tendering could bring forth huge benefits for organizations through improvement in transparency, efficiency and reduction costs. Thus, incompatible technological architecture decreases the efficiency in operations on the Electronic Procurement infrastructure. This further decreases the speed of the systems, which further

causes user frustration when tendering thus affecting the efficiency in procurement performance.

2.4.2 E-invoicing

In order to develop e-invoicing solution that is viable, companies are required to develop critical mass through a value network of alliances and providers of technology to add the required desirability for e-invoicing by financial SC in controlling the cost of procurement transaction to improve the performance of procurement.

2.4.3 E-payment

E-payment is growing at a very fat rate globally and its potential is beyond measure. Clients are provided with the benefit all the time, they can transact anywhere at a low cost and also shortens the distance that exist between the seller and the buyer. It is also beneficial to be buyer and the seller; it saves on cost and speeds up the process of buying and selling, exposes to new clients and improves transparency to the customers.

2.5 Operationalization of Conceptual Framework

In this section the variables that are being focused on in this study are operationalized, with other elements in the conceptual framework. The predictor variable will be the e-tendering, e-invoicing and e-payment. The dependent variable will be supply chain performance as indicated in Table 2.1.

Table 2.1: Operationalization of Conceptual Framework

Variable	Nature of variables	Operational Indicators	Measurement scale
E-Tendering	Independent	• Ease of access to suppliers • Coordination between suppliers • customer supplier relationship	Ordinal
E-Invoicing	Independent	• Payment time • Cost of procurement transaction • Speed of communication • Reliability of service delivery	Ordinal
E-Payment	Independent	• Agency costs • Level of convenience • Cost of payment online • Level of trust payment systems	Ordinal
Supply Chain Performance	Dependent	• warehousing • inventory management and forecasting • customer service • procurement & supply management	Ordinal

Source: Researcher (2018)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter comprises of the methodology that was used in conducting the study. This constitutes research design, target population, sample frame, samples and sampling procedure, instrumentation, data collection and finally data analysis techniques.

3.2 Research Design

The study adopted descriptive research design; this method applies some scientific techniques and procedures in collecting raw data and creating of data structures describing the characteristics that exist of a target population that is defined (Churchil & Brown, 2007).

In a descriptive study, it aims to describe a subject through the creation of a profile of group of issues/individuals/events by collecting data and tabulating frequency on research variables or how they interact (Mugenda & Mugenda, 2008). Through a descriptive research design, the researcher is able to gather quantitative information from the respondents. The collected data respond to questions that concern current state or subjects that are being studied (Cooper and Schindler, 2013).

3.3 Target Population and sample frame

Elements having one or more than one character in common and are being studied are termed as target population (Peil, 2011). In this study, the targeted population constituted 78 heads of departments in the 9 food manufacturing firms in Nairobi's Industrial Area. The food manufacturing firms are chosen on the basis of regularly carrying out purchases

from the suppliers, (Kenya Association of Manufacturers, 2017). Because the study population was small, the study used a census.

Table 3.1: Population and sample frame

Category	**Heads of departments**			**Total Population**
	Procurement	Finance	Other user departments	
Famers Choice Ltd	1	1	8	10
Nestle Foods (K)	1	1	7	9
Maisha Flour Mills	1	1	8	10
Unga Group	1	1	7	9
House of Dawda Group	1	1	4	6
Alpha Fine Foods	1	1	6	8
Melvin Marsh	1	1	6	8
Propack Kenya Ltd	1	1	5	7
Manji Foods	1	1	9	11
Total	**-**	**-**	**-**	**78**

Source: The HR, Food Manufacturing Companies (2018)

3.4 Research Instrument

Questionnaires were used to collect primary data. Questions collected together and addresses the research questions are referred to as a questionnaire (Mugenda & Mugenda, 2008). The study used semi-structured questionnaires. Advantage of using this method as stated by Mugenda includes the closed ended questions allow the respondents to answer questions on specific issues and it is easier to analyze statistically and code them.

Designing of the questionnaires was done based on the specific objectives of the study. Quality of the data gathered was enhanced by using 5-point Likert scale questions.

3.5 Validity and Reliability of the Instrument

Trochim (2013) defined validity to be the level to which a test provides the measures of what it was designed to measure. It's not possible to attain 100% validity; therefore we measure validity in degrees. The process of validation involves collection and analyzing data in assessing how accurate the instruments are. Validity of the research tool was confirmed by experts in the field who were lecturers and supervisor; their main purpose was to test whether the questions were structured well and its content. To achieve this, the questionnaires were formulated and presented to supervisors who then reviewed and provided guidelines. Research assistant helped to simplify the questions for the respondents to easily understand.

The main concern of reliability is the extent the research tool provide similar output after the process is repeated severally; it is important for reliability to be determined since there's a good deal of consistency in the output of the quality instrument collected in various times (Lyon, 2012). Cronbach's alpha which measures internal consistency was used to test validity. Through the Cronbach's alpha it gives a useful lower bound on reliability. Through Cronbach's alpha, the value increased as the correlation existing between the items increased.

Cronbach alpha valued lie from 0 to 1. According to Holborn and Langley (2014) acceptable alpha value is 0.7 which implies reliability of the variable. If the alpha value is greater than 0.95 it implies that it's not desirable because it could suggest redundancy. There is a tendency of Cronbach's alpha increasing evenly without the increase in

internal consistency. The goal to design an instrument that is reliable instrument is for scores on the same items to be related but all to contribute information that is unique.

3.6 Data Analysis

Data analysis refers to the process where the gathered data is packaged then put in order and structured the main aspects in a manner that will ensure that the findings are communicated with ease and effectively (Kerlinger, 2013). The study collected qualitative data which was analyzed descriptively using SPSS.

The Analytical Model

The study established the combined effects of study variables by computing multiple regression analysis was used to establish the combined effect on the study variables. The regression analysis model was specified as follows;

$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$:

Where

Y = supply chain performance;

X_1 = e-tendering;

X_2 = e-invoicing;

X_3=e-payment,

α = constants term, i.e. the supply chain performance that does not depend on variables under study

$\beta_1, \beta_2, \beta_3$ = regression coefficients of X_1, X_2 and $X_3$and

ε = error item. Presentation was done in tables.

3.7 Diagnostic Tests of Significance

3.7.1 The t-test

The *t-test* was used to indicate if the attribute have any correlation in the population. T-test also tested the significance of each of the predictor variables in influencing supply chain performance. This was done at 95% confidence level. If the value of t is nearing 0 it suggest that we reject the null hypothesis and that implies that the attributes are correlated (Gujarati, 2010). A P-value of the t- statistic greater or equal to 0.05 would lead to acceptance of the null hypothesis which consequently shows the significant of data.

Correlation analysis was adopted as statistical tool to determine the extent to which the variables are related. The association between the variables was analyzed by developing a correlation matrix. if the value of the correlation is zero it implies that the variables under consideration are not related while a correlation value if 1 implies that the variables are perfectly related (Gujarati, 2010). Interpretation of the values was between 0 and 1.

3.7.2 Goodness of Fit Test/coefficient of determination

The extent of variation of SC performance was explained using R^2. Adjusted R^2 was applied in testing goodness-of-fit requirement bearing the multiple determinants. Correlation analysis was used to compute correlation coefficient (r) which was applied in assessing the association of the variables, the direction of their association and its strength.

3.7.3 ANOVA Test (F-Test)

F-test was performed to test the significance of the whole model at a 5% significance level. The F-calculated value from the regression data and the F-critical value from the F-distribution table was applied in determining the robustness of the model. The p-value was also used in testing the significance of the model. Krishnaswami (2013) assert that if the model results of the p-value is below 0.05, and then the model is deemed satisfactory.

3.7.4 Economic Plausibility test

Economic plausibility test was carried out to check the logic of the relationship that is expected to prevail between financial performance and each of the independent variables Otaki (2015).

Specification analysis of estimation assumption

3.7.5 Multicollinearity Test

The researcher carried out both multicollinearity and normality tests. Multicollinearity states where independent variables are inter correlated (Mugenda & Mugenda, 2008). In cases that are severe, (correlation value of positive or negative 1 shows severe multicollinearity, the extremes) multicollinearity makes the process of estimating of regression coefficients not possible and in some other cases it makes the estimates not reliable. In comparison of the different values of R^2 the highest value is selected as the representation of the degree of multicollinearity that exists in the sample.

3.7.6 Heteroscedasticity Diagnostics

Heteroscedasticity diagnostics are statistical tests of whether a set of variables have linear or non-linear relations (Bray & Maxwell, 2012). In determining if data set is modeled

appropriately and in computing the likelihood of a random variable that underlies a data set to have a normal distribution, normality tests are applied (Sekaran & Bougie, 2013). To achieve this, this study utilized the Karl Pearson's coefficient of correlation. The correlation values ranges from - 1 to +1. If the value nears 0 it implies that the attributes have little correlation and if the value nears +1 or -1 it implies that it is highly correlated either positively or negatively.

3.7.7 Serial auto correlation test

The test that was used to check for autocorrelation in the data is Durbin Watson (DW) test in checking that the residuals are not correlated because the independence of the residuals is one of the basic hypotheses of regression analysis.

The formula for this test is: $DW = \frac{\sum (e_t - e_{t-1})^2}{\sum e_t^{\,2}}$,

Where: e_t Is residual at period t, and e_{t-1} is residual in the previous period.

To test for serial correlation we use the Durbin-Watson *d*-statistic. If the value is close to two 2, then no serial correlation but if less than 1.5 or greater than 2.5 we should take notice. The Durbin alternative test, which is better since it allows for more than one lag and also produces a test statistic with a p-value of <0.001, meaning that we reject hypothesis of no correlation and conclude that there is serial correlation.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSIONS OF FINDINGS

4.1 Introduction

This chapter discussed data analysis, interpretation, presentation and discussion of the findings that were gathered from the field. Specifically, the chapter covered the background information of the respondents, analysis based on the objectives of the study. To facilitate discussion of the findings, the study used descriptive as well as inferential statistics.

4.2 Response Rate

The study targeted 78 heads of departments in the 9 food manufacturing firms in Nairobi's Industrial Area. Only 65 respondents returned their questionnaires which translated to 83.3% response rate. Mugenda and Mugenda (2008) asserted that a response rate of 50% can be used for analysis since its considered to be adequate, he also added that if the response rate is 70% and above it is considered excellent. Based on this assertion, our rate of response was considered excellent for analysis and reporting.

Table 4.1: Response rate

Response	Frequency	Percent
Returned	65	83.3
Unreturned	13	16.7
Total	**78**	**100.0**

4.3 Reliability Analysis

The main aim of reliability analysis is to establish how reliable data collection is, in our case reliability of the questionnaire. The study used Cronbach's alpha to determine the

reliability of each objective. The acceptable threshold value for reliability was 0.7 (Gliem & Gliem, 2003) thus forming a benchmark for the study.

From the findings presented in Table 4.2 E-tendering has an alpha of 0.897, e-invoicing has an alpha of 0.773, e-payment has an alpha of 0.934, and supply chain performance has an alpha of 0.750. The results show that all the variables has alpha values greater than 0.7 which is an indication that they were all reliable and therefore all indicators were included in the study.

Table 4.2: Reliability analysis

Scale	Cronbach's Alpha	Number of Items
E-Tendering	0.897	5
E-Invoicing	0.773	5
E-Payment	0.934	5
Supply Chain Performance	0.750	3

4.4 Diagnostic Tests

4.4.1 Normality Test

Table 4.3: Normality Test

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
SCP	65	0.77580	12.997	5.554	0.00000
EP	65	0.76432	13.662	5.662	0.00000
EI	65	0.86574	7.783	4.443	0.00000
ET	65	0.80474	11.319	5.254	0.00000

The assumption of multiple regression analysis is that the variables follow a normal distribution. If the variables are not normally distributed they can affect their association and significance tests. This study tested normality using Shapiro Wilk Test where the null hypothesis is that the population is normally distributed. The null hypothesis will therefore be rejected if the selected alpha value is greater than the p-value obtained since there will be enough proof that the population does not follow a normal distribution. On the other hand, if the value of p obtained is less than the selected alpha value it means the population is normally distributed. From the finding's supply chain performance (p-value=0.00000), e-tendering (p-value=0.00000), e-invoicing (p-value=0.000) and e-payment (p-value=0.00074) had p-values less than 0.05 which is an indication that they all followed a normal distribution. Since all variables followed normal distribution, the data meets the regression analysis assumption of normality of data.

4.4.2 Autocorrelation Test

The study used Breusch-Godfrey Langrage Multiplier test to test for autocorrelation assumption.

Table 4.4: Breusch-Godfrey Langrage Multiplier test

Breusch-Godfrey LM test for autocorrelation

lags(p)	chi2	df	Prob > chi2
1	1.937	1	0.1640

H0: no serial correlation

From the findings, the p-value (0.1640), was greater than the selected significance level of 0.05. We therefore fail to uphold the null hypothesis and conclude that the variables are not serially auto correlated.

4.4.3 Heteroscedasticity Test

The study used Breusch-Pagan/Cook-Weisberg test for heteroscedasticity. Homoscedasticity explain the situation whereby all the error terms of the predictor variables are similar while heteroscedasticity which is the opposite of homoscedasticity refers to the situation whereby the error terms of the predictor variables differ. The effect of overlooking the assumption of homoscedasticity id the increase of degree as the heteroscedasticity increases.

Table 4.5: Breusch-Pagan/Cook-Weisberg test for heteroscedasticity

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of SCP

         chi2(1)      =      0.00
         Prob > chi2  =    0.9788
```

The p-value was 0.9788 which was greater than 0.05 significant levels. The study therefore accepts the null hypothesis of homoscedasticity.

4.5 Demographic Information

4.5.1 Gender of the Respondents

The study sought to determine the gender of the respondents by asking them to indicate their gender. The results are as shown in Figure 4.1.

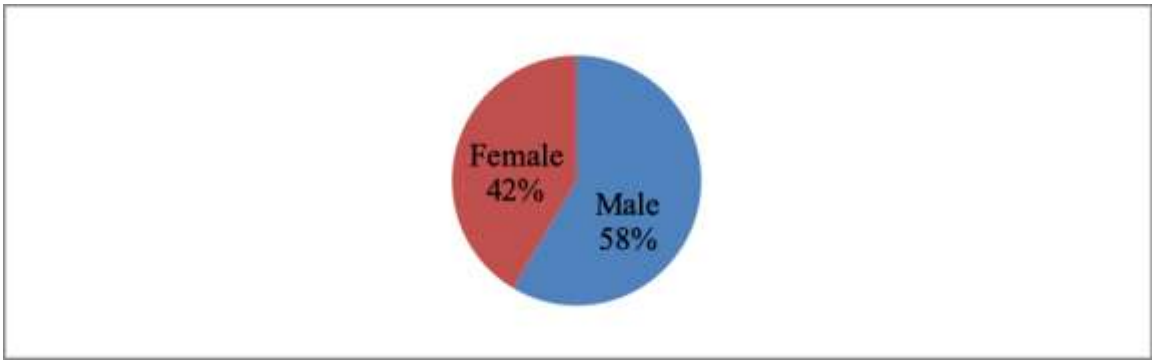


Figure 4.1: Gender of the Respondents

Majority (58%) of the respondents were of the male gender while the remaining 42% were female. Since both genders were fairly represented, it can be concluded that the study was not gender biased.

4.5.2 Respondents Level of Education

Respondents indicated their level of education and the results were as represented in Figure 4.2.

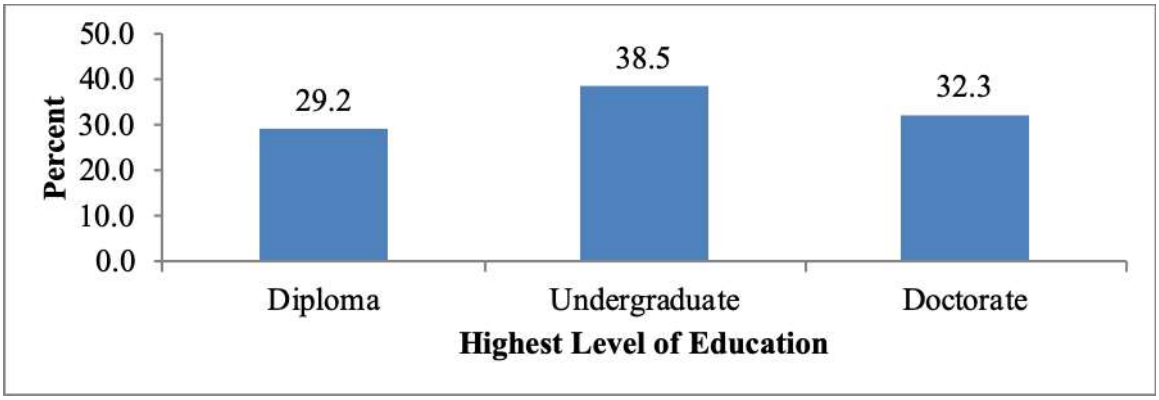


Figure 4.2: Respondents Level of Education

From the findings, 38.5% of the respondents indicated that their highest level of education was undergraduate, 32.3% had doctorate, 29.2% had diploma. This is an indication that the respondents had acquired various skills for their various positions in

the organization. Most (38.5%) had at least undergraduate as their highest level of education.

4.5.3 Respondents Work Experience

Respondents indicated the years they had worked in the organization and the results were as shown in Figure 4.3.

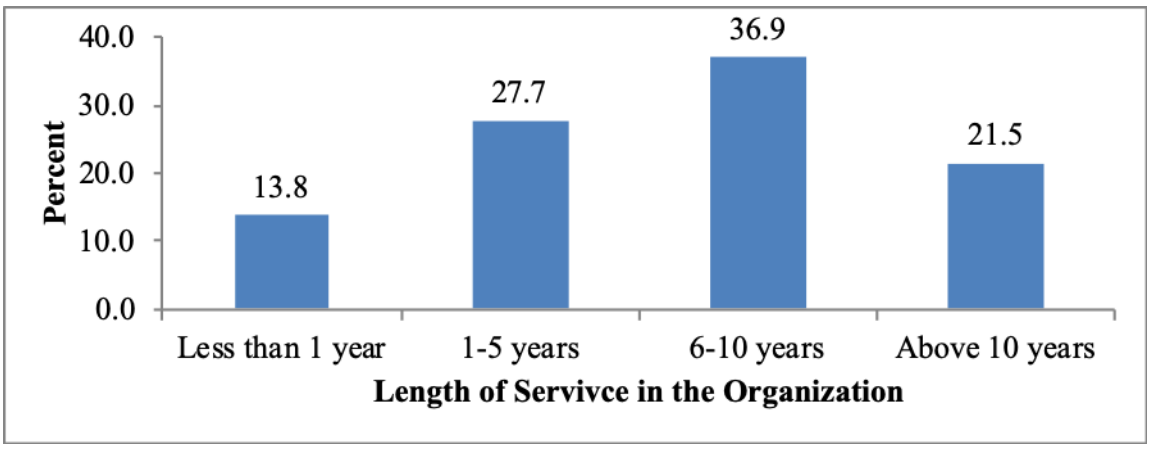


Figure 4.3: Respondents Work Experience

From the findings, 36.9% of the respondents indicated that they have worked in the organization for 6-10 years, 27.7% indicated 1-5 years, 21.5% indicated above 10 years, 13.8% indicated less than one year. This showed that the respondents used in the study had some experience in the organization and therefore had the information needed. Most of the respondents had worked more than a year.

4.6 Descriptive Statistics

The study sought to determine the level of agreement of respondents various statements of electronic procurement; where SA- strongly agree, A-Agree, U-Undecided, D-Disagree, SD-strongly Disagree.

4.6.1 E-Tendering and Supply Chain Performance

Respondents were requested to indicate their level of agreement on various statements on effect of e-tendering on supply chain performance in food manufacturing firms. The results are as shown in Table 4.3.

Table 4.6: E-Tendering on Supply Chain Performance

	Minimum	Maximum	Mean	Std. Deviation
Every year, planning and submission of procurement is done online with the aim of attracting tendering process	3.00	5.00	4.0000	.17678
All purchase requisitions are online for tendering	2.00	5.00	3.9692	.30461
Managers have integrated the use of e-tendering in all the processes related with procurement.	3.00	5.00	4.0000	.25000
e-tendering provides ease of access to market structures	2.00	5.00	3.9692	.30461
E-tendering promotes good supplier relationship	4.00	5.00	4.0154	.12403

Respondents agreed that e-tendering promotes good supplier relationship as shown by a mean of 4.0154, every year, planning and submission of procurement is done online with the aim of attracting tendering process as shown by a mean of 4.0000, all purchase requisitions are online for tendering as shown by a mean of 3.9692, managers have integrated the use of e-tendering in all the processes related with procurement as shown by a mean of 4.0000 and e-tendering provides ease of access to market structures as shown by a mean of 3.9692. This is further supported by Kauffman and Kriebel (2011) in a study which revealed that through e-procurement companies are able to attain competitive advantage. Gunasekaran and Ngai (2011) carried a study to examine factors that influence the use of e-tendering among contractor firms in Malaysia and established

that e-tendering is perceived to be useful within the Malaysian construction company and that is why managers and personnel in the industry have strong intention towards using it despite its challenges.

4.6.2 E-Invoicing and Supply Chain Performance

Respondents were asked to indicate their level of agreement with statements on effect of e-invoicing on supply chain performance in food manufacturing firms. The results are as shown in Table 4.4.

Table 4.7: E-Invoicing on Supply Chain Performance

	Minimum	Maximum	Mean	Std. Deviation
E-invoicing enables reduction in payment time	4.00	5.00	4.0154	.12403
E-invoicing promotes security of financial data	3.00	5.00	4.0000	.17678
The cost of the infrastructure is reduced in every single transacting when there is a rise in volume of transactions	4.00	5.00	4.0154	.12403
E-invoicing increases speed of communication for repayment purposes	3.00	4.00	3.9846	.12403
E-invoicing enhances reliability of service delivery	4.00	4.00	4.0000	0.00000

From the findings, the respondents agreed that E-invoicing enables reduction in payment time as shown by a mean of 4.0154, the cost of the infrastructure is reduced in every single transacting when there is a rise in volume of transactions as shown by a mean of 4.0154, E-invoicing promotes security of financial data as shown by a mean of 4.0000, E-invoicing enhances reliability of service delivery as shown by a mean of 4.0000, and E-invoicing increases speed of communication for repayment purposes as shown by a mean of 3.9846. These is in agreement with Archer (2015) who stated that indicated that such

as in the economies of transaction cost, infrastructure cost is lowered per transaction when there is an increase in volumes of transaction. It also agrees with Barratt and Rosdahl (2012) who claimed easy searching and transparency is an advantage to the customer. The cost of procurement is lowered by economies of suppliers search and e-marketplace to SCM is being elaborated in 3 dimensions: lowered unit cost, increase in efficiency and operations that are streamlined.

4.6.3 E-Payment and Supply Chain Performance

Respondents were requested to indicate their level of agreement on effect of e-payment on supply chain performance in food manufacturing firms. The results are as shown in Table 4.5.

Table 4.8: E-Payment on Supply Chain Performance

	Minimum	Maximum	Mean	Std. Deviation
There is low cost of procurement transaction for repayment purposes	3.00	4.00	3.9692	.17404
All store issuing are made online	2.00	5.00	3.9692	.30461
E-payment offers total convenience	3.00	5.00	4.0000	.17678
The parties to online procurement have high level of trust on online payment systems	2.00	4.00	3.9538	.27561
The online payment eliminates agency costs	3.00	5.00	4.0000	.17678

Respondents agreed that e-payment offers total convenience as shown by a mean of 4.0000, the online payment eliminates agency costs as shown by a mean of 4.0000, there is low cost of procurement transaction for repayment purposes as shown by a mean of 3.9692, all store issuing are made online as shown by a mean of 3.9692 and the parties to online procurement have high level of trust on online payment systems as shown by a

mean of 3.9538. These findings are in agreement with Cheng (2010) who stated that e-payment is an area that is growing fast globally and almost carry potential beyond measures. In addition, clients are provided with benefits anytime, anywhere at a low cost; it transforms the world into behaving like a small village by shortening the distance between the buyer and seller (Porter, 2001). It also agrees with Standing (2011) who indicated that some of the advantages ids that it saves on cost, increases selling and buying process, exposes the business to new clients, it is convenient to users and provides transparency, improves quality of products and services, lower the need to office space and reduces the number of resources needed..

4.6.4 Supply Chain Performance in Food manufacturing firms

Respondents were requested to indicate their level of agreement with the following statements on supply chain performance. The results are as shown in Table 4.6.

Table 4.9: Supply Chain Performance

	Minimum	Maximum	Mean	Std. Deviation
E-procurement application reduces time from requisition to issuing	4.00	4.00	4.0000	0.00000
Stock out is not experienced whenever e-procurement application is used	4.00	5.00	4.0154	.12403
E-Procurement system is well integrated with the other systems in operations to enhance performance	4.00	5.00	4.0154	.12403

Respondents agreed that their organization applies the use of E-procurement whereby the requisition period to issuing period is reduced as shown by a mean of 4.0000, the use of e-procurement application results to no stock out as shown by a mean of 4.0154, systems of E-Procurement have been integrated well with other systems in operations to enhance

performance as shown by a mean of 4.0154. Subramani (2014) indicated that companies that deal with manufacturing of food need to optimize on the use of technology that is based on the internet in all the processes in the business, and link supply chain members, fasten the process of transferring information, and lower those expenses that do not add value. Shaw (2014) stated that B2B that are internet enabled improves the coordination between businesses which result in saving of cost incurred in transactions and sourcing of emerging competitive opportunities for the company of the buyer.

4.7 Inferential Statistics

4.7.1 Correlation Analysis

Linear association between two variables is measured using correlation coefficient. The correlation values ranges from -1 and +1. If the value is ±1it implies the two variables under consideration are perfectly correlated either positively or negatively. If the correlation value is 0, it implies that the variables are not related. If the correlation coefficient is 0.1 and 0.19 it is considered to be "very weak", if it is 0.20 and 0.39 it is regarded as being weak if it is 0.40 and 0.59 it is considered to be moderate, between 0.60 and 0.79 is said to be strong and 0.8 and 1 is considered "very strong".

Karl Pearson product-moment correlation coefficient was used in conducting correlation analysis. Correlation Coefficient was applied in testing if there is a case of interdependence among the variables and whether predictor variables are associated with the response variable (supply chain performance in food manufacturing firms).

Table 4.10: Correlations

		SC Performance	E-Tendering	E-Invoicing	E-Procurement
SC Performance	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	65			
E-Tendering	Pearson Correlation	.969**	1		
	Sig. (2-tailed)	.000			
	N	65	65		
E-Invoicing	Pearson Correlation	.947**	.914**	1	
	Sig. (2-tailed)	.000	.000		
	N	65	65	65	
E-Procurement	Pearson Correlation	.985**	.942**	.931**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	65	65	65	65

****. Correlation is significant at the 0.01 level (2-tailed).**

There is a positive association between e-tendering and supply chain performance in food manufacturing firms in state corporations in Kenya (r=0.969, p-value=0.000). There is also positive relationship between e-invoicing and supply chain performance in food manufacturing firms (r=0.947, p-value=0.000). The findings also established a positive association between e-procurement and supply chain performance in food manufacturing firms (r=0.985, p-value=0.000).

These results imply that the independent variables (e-tendering, e-invoicing and e-procurement) influence supply chain performance in food manufacturing firms.

4.7.2 Multiple Regression Analysis

4.7.2.1 Model Summary

Model summary is usually applied in determining the amount of variation in response variable that can be explained by the changes in predictor variables. Model summary in this study was used to analyze variation in SC performance in food manufacturing companies as a result of change in e-tendering, e-invoicing and e-procurement.

Table 4.11: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.994[a]	.987	.987	.02022

a. Predictors: (Constant), E-Procurement, E-Invoicing, E-Tendering

The value of adjusted R^2 was 0.987 which implies that 98.7% variation in supply chain performance in food manufacturing can be explained by changes in e-tendering, e-invoicing and e-procurement. The remaining 1.3% suggest that there exist other factors that contribute to variation i supy chain performance in food manufacturing comoanies taht we not included in this model. Correlation coefficient which is denoted by R shows the relationship that exists between the variables under investigation. From the findings, the variables were strongly and positively related as shown by correlation coefficient value of 0.994.

4.7.2.2 Analysis of Variance

The F-critical (3, 61) value obtained from the F-distribution tables was 2.755 while the F-calculated was 1592.163. The value of F-critical was less than the F-calculated value,

which was an indication that there was a significant linear relationship existing between e-tendering, e-invoicing and e-procurement and supply chain performance in food manufacturing firms. The p-value from the ANOVA table was found to be 0.000 which was less than the selected level of significance (0.05); this confirms that the model was a good fit for predicting the influence of e-tendering, e-invoicing and e-procurement and supply chain performance in food manufacturing firms.

Table 4.12: ANOVA[a]

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.953	3	.651	1592.163	.000[b]
	Residual	.025	61	.000		
	Total	**1.978**	**64**			

a. Dependent Variable: SC Performance

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

4.7.2.3 Beta Coefficients of the study Variables

The regression equation was

$$Y = 0.465 + 0.278X_1 + 0.130X_2 + 0.475X_3 + \varepsilon$$

The equation above revealed that holding e-tendering, e-invoicing and e-procurement variables to a constant zero, they will significantly influence supply chain performance in food manufacturing firms as shown by constant =0.465 as shown in Table 4.10

Table 4.13: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.465	.053		8.748	.000
	E-Tendering	.278	.039	.323	7.187	.000
	E-Invoicing	.130	.038	.141	3.408	.001
	E-Procurement	.475	.043	.550	11.045	.000

a. Dependent Variable: SC Performance

E-tendering has statistically significant effect of supply chain performance in food manufacturing firms ($\beta = 0.278$, $P = 0.000$). It implies that e-tendering significantly and positively relate with supply chain performance in food manufacturing firms. Implying that increasing e-tendering will lead to increase in supply chain performance in food manufacturing firms.

E-invoicing has statistically significant effect of supply chain performance in food manufacturing firms ($\beta = 0.130$, $P = 0.001$). It shows that e-invoicing significantly and positively relate with supply chain performance in food manufacturing firms. Implying that increasing e-invoicing by a single unit will result to increase in supply chain performance in food manufacturing firms.

E-procurement has statistically significant effect of supply chain performance in food manufacturing firms ($\beta = 0.475$, $P = 0.000$). It shows that e-procurement significantly and positively relate with supply chain performance in food manufacturing firms. Implying that increasing e-procurement by a single unit will result to increase in supply chain performance in food manufacturing firms.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

In this chapter, summary of the findings are presented, conclusions drawn from the findings are highlighted and recommendations are made. Conclusions and recommendations made address the objectives of the study.

5.2 Summary of the Findings

5.2.1 E-Tendering and Supply Chain Performance

The study established that e-tendering promotes good supplier relationship, yearly procurement planning and submission is done online to attract tendering process, all purchase requisitions are online for tendering, managers have integrated the use of e-tendering in all the processes related with procurement and that e-tendering provides ease of access to market structures. This is further supported by Kauffman and Kriebel (2011) revealed that through e-procurement companies are able to attain competitive advantage. Also Gunasekaran and Ngai (2011) in their study they established that e-tendering is perceived to be useful within the Malaysian construction company and that is why managers and personnel in the industry have strong intention towards using it despite its challenges.

5.2.2 E-Invoicing and Supply Chain Performance

The study revealed that e-invoicing enables reduction in payment time, the cost of the infrastructure is reduced in every single transacting when there is a rise in volume of transactions, e-invoicing promotes security of financial data, e-invoicing enhances reliability of service delivery, and e-invoicing increases speed of communication for

repayment purposes. These is in agreement with Archer (2015) who stated that indicated that such as in the economies of transaction cost, infrastructure cost is lowered per transaction when there is an increase in volumes of transaction. It also agrees with Barratt and Rosdahl (2012) who claimed easy searching and transparency is an advantage to the customer. The cost of procurement is lowered by economies of suppliers search and e-marketplace to SCM is being elaborated in 3 dimensions: lowered unit cost, increase in efficiency and operations that are streamlined.

5.2.3 E-Payment and Supply Chain Performance

The study established that e-payment offers total convenience, the online payment eliminates agency costs, there is low cost of procurement transaction for repayment purposes, all store issuing are made online and the parties to online procurement have high level of trust on online payment systems. These findings are in agreement with Cheng (2010) who stated that e-payment is an area that is growing fast globally and almost carry potential beyond measures. In addition, clients are provided with benefits anytime, anywhere at a low cost; the distance between sellers and buyers is reduced (Porter, 2001). It also agrees with Standing (2011) who indicated that some of the advantages ids that it saves on cost, increases selling and buying process, exposes the business to new clients, it is convenient to users and provides transparency, improves quality of products and services, lower the need to office space and reduces the number of resources needed..

5.2.4 Supply Chain Performance in Food manufacturing firms

The study found that organization applies the use of E-procurement whereby: the requisition period to issuing period is reduced, no stock out is experienced, systems of E-

Procurement have been integrated well with other systems in operations to enhance performance. Subramani (2014) indicated that companies that deal with manufacturing of food need to optimize on the use of technology that is based on the internet in all the processes in the business, and link supply chain members, fasten the process of transferring information, and lower those expenses that do not add value. Shaw (2014) stated that B2B that are internet enabled improves the coordination between businesses which result in saving of cost incurred in transactions and sourcing of emerging competitive opportunities for the company of the buyer.

5.3 Conclusion

The study established that e-tendering statistically and significantly influences SC performance in food manufacturing firms. It was further established that the influence of e-tendering on SC performance was positive. Regarding e-invoicing, it was found that it has statistically significant influence SC performance in food manufacturing firms. The study further revealed that e-invoicing had significant positive relationship with supply chain performance in food manufacturing firms. The study found that e-procurement has statistically significant influence on SC performance in food manufacturing firms. Furthermore, it was revealed that e-procurement significantly and positively related with supply chain performance in food manufacturing firms.

5.4 Recommendations

5.4.1 E-Tendering and Supply Chain Performance

The study found that e-tendering positively and significantly influences SC performance in food manufacturing firms. Management of the food manufacturing companies should therefore ensure that the technological architecture used in electronic procurement is

compatible. This will ensure that the system is fast therefore increasing user satisfaction and thus increasing procurement performance.

5.4.2 E-Invoicing and Supply Chain Performance

Regarding e-invoicing the study found that it positively affects SC performance. It is recommended for managers of the firms to have financially viable e-invoicing solution through creation of critical mass through alliance partners an providers of technology to add the necessary desirables of e-invoicing through financial supply chain in controlling the cost of transactions of procurement to better the performance of procurement.

5.4.3 E-Payment and Supply Chain Performance

E-procurement positively affect supply chain performance in food manufacturing firms. E-payment is fast growing and possesses great potential that is beyond measure; the study thus recommends company's management to integrate e-payment in their business transactions. This will save cost and speed up the buying and selling processes and reduces the distance of buyer and seller thus increasing supply chain performance.

5.5 Limitations of the Study

Collection of data was done using questionnaires and it was the main tool used. The yearly reports of the company were used as source for secondary data. Researcher didn't have control over responses provided. Because of fear that the information they provide will leak to rivals, the respondents were not willing to provide full information. The duration set for collection of data was 2 weeks which was not sufficient. To dispel the fear of the respondents, the researcher explained to them that the information they provide was purely for academic reasons and that it would be kept confidential. This was

done to improve accuracy in the data collected. Research assistants were employed to assist in collection of data.

5.6 Suggestions for Further Studies

This study sought to evaluate the effects of electronic procurement on supply chain performance in food manufacturing firms in Nairobi City County, Kenya. The study recommends replication of the research study in other food manufacturing firms located in other counties to allow comparison of the findings.

Similar study should be conducted in other industries such as the textile industry. The study also recommends a study to be conducted on challenges facing the use of electronic procurement on supply chain performance.

REFERENCES

Archer, N. (2015) An Overview of the Change Management Process in government, *International Journal of Electronic Business*, 3, 1, 68-87.

Bakos, G. (2012). B2B Progress in Italian Organization, A multiple case study. *Human Resources Procurement Journal*, 21(3), 275- 292.

Bateman S. (2012), *A Theory of Incentives in Procurement and Regulation*. MIT Press. Johannesburg.

Baldrige, V. J. & Burnham, R. A. (2015).Organizational innovation: individual, organizational and environmental impacts, *Administrative Sciences Quarterly, 20,165-76.*

Berger, C., R., & Calabrese, R. J. (2015). Bridges over troubled water: suppliers as connective nodes in global supply networks", *Journal of Business Research*, Vol. 58, pp. 1261-85.

Burn, J., & Robins, G. (2013). Moving towards E-government: A Case Study of Organizational. *Change Processes, Logistics Information Management*, 16, 1, 25-35.

Bray, J. H., and Maxwell, S. E. (2012). *Multivariate analysis of variance*. 6th edition Thousand Oaks, GA: Sage.

Carter, L., & Belanger, F. (2015). The utilization of e-Government services: citizen trust, innovation and acceptance factors. *Information Systems Journal* 15: 5-25.

Chan, S. & Lu, M. (2014). Understanding internet banking adoption and use behavior: a Hong Kong perspective, *Journal of Global Information Management*, 12, 21-43.

Chau, P., Y., K. & Tam, K.Y. (2012). Factors affecting the adoption of open procurement systems: an exploratory study, *MIS Quarterly*, 21, 1-24.

Cheng N. (2010), *Management Support Systems for Service Quality Management*, Brandon-Jones Publications, Mumbai,

Clarke, D. (2011). Barriers to e-tendering in the Ghana construction industry. Montego Bay, *Jamaica, International Institute for Communication and Development.*

Crenshaw, E., M. & Davenport, T. (2011)..Globalization and the digital divide: the roles of structural conduciveness and global connection in internet diffusion", *Social Science Quarterly Journal, 87, 190-207.*

Davenport, T. (2011). Putting the enterprise into the enterprise system", *Harvard Business Review*, 76 (4), 121-31.

Esipisu U. and Tharaka, A. (2012). Total cost of relationship: An analytical framework for the logistics outsourcing decisions, *Journal of Business Logistics,* Vol. 18 No. 1, pp. 45-66.

Fitzgerald, B. (2013). *Unpacking the Systems Development Process*, the Journal of Strategic Information Systems.

Gichuru, M. (2012). Critical success factors in business process outsourcing of procurement services in companies in Kenya, unpublished MBA project, University of Nairobi.

Gujarati, R. (2010). Strategy Research, Governance and Competence Perspectives, *A journal of research Studies, Leicester University 3(34-45).*

Gunasekaran, A., & Ngai, E. (2011). Factors that influence the use of e-tendering among contractor firms in Malaysia; An empirical Research, *International Journal production economics*, 33, 133.

Hines, P. (2014). *Creating World Class Suppliers*. Unlocking Mutual Competitive Advantage, Pitman, London.

Holborn, M. and Langley, P. (2014). Research *Sociology: Themes and perspectives,* London: Collins Educational, London UK.

Hyung, (2014), .*Integrative strategic performance measurement systems, strategic alignment of manufacturing, learning and strategic outcomes:* an exploratory study. Accounting, Organizations and Society, vol. 30, no. 5, , pp. 395-422.

Kangongo and Gakure (2013). identify the impact of Electronic Procurement in the automobile industry in Kenya. *International Journal of Service Industry management.*

Kariko, S. (2015). *E-procurement and market evolution: an evolutionary game approach. Proceedings of the 7th international conference on Electronic commerce* CEC '05, 15-17, pp. 423-428.

Kauffman, R.J. (2011), *Business Models for Internet-Based E Procurement Systems,* The Free Press, New York.

Kauffman, J., &Kriebel, A. (2011. Where we're going, *Electronic procurement*, 12, 27-33.

Kerlinger S. (2013). *Methodology of Educational Research,* 2nd edition,Vikas Publishing House PVT Ltd, New Delhi, India.

Makau, S. (2014). Challenges that face the adoption of e e-tendering in the public sector in Kenya, *African Journal of Business Management*, 5(4), 1266- 1276.

Matunga, D. A. (2013). The Effect of E-Procurement Practices on Effective Procurement in Public Hospitals: A Case of KISII Level 5 Hospital; *American International Journal of Contemporary Research Vol. 3 No. 8; August 2013.*

Mose, Njihia and Magutu (2013). success factors and challenges pertaining to Electronic Procurement, *Journal of Procurement Practices, Vol.2.*

Otaki,M.(2015) Ramsey's Belief and the plausibility of Keynesian Economics.Theoretical economics letters,5,725-729

Parmer, R., (2011), Moving procurement systems to the Internet: The adoption and use of e-procurement technology models. *European Management Journal, vol. 21, no. 1, pp. 11-.*

Shaw, J.M., (2014). Success factors and impacts of mobile business applications: Results from mobile e-procurement study. *International Journal of Electronic Commerce, vol. 8, no. 3, Spring, pp. 19-41.*

Wamego, J. (2015). *Tackling graft in public procurement.* Adili, Transparency International News Service Publication. Nairobi.

Appendices

Appendix I: The Food manufacturing firms Targeted

1. Farmers Choice Ltd
2. Nestle foods Kenya Limited
3. Proctor & Allan East Africa Limited
4. Maisha Flour Mills
5. Unga Group Ltd
6. House of Dawda Group
7. Alpha Fine Foods Ltd
8. Melvin Marsh International
9. Propack Kenya Limited
10. Manji Foods Limited

Source: KRA, http://www.revenue.go.ke/index.php/food-and-other-manufacturer

Appendix II: Letter of Introduction

Aseka Truphosa

KCA University

Nairobi

Dear Respondent,

Re: Request for participation in research work

I am a Master student at KCA University, and as part of my requirements for the award of the Master of Science Degree, I am expected to carry out and submit a research project.

I am currently conducting a research on the **"effects of electronic procurement on supply chain performance in food manufacturing firms in Nairobi county, Kenya"** The information you provide will be treated confidentially and will be used solely for academic purpose.

Yours Faithfully

AsekaTruphosa

15/01595

Appendix III: Questionnaire

Dear Respondent

The following questionnaire aims to establish the **"effects of electronic procurement on supply chain performance in food manufacturing firms in Nairobi County, Kenya.** I kindly request you to provide your honest answer on each of the questions. Do not indicate your name anywhere in the questionnaire to ensure confidentiality.

Thank you for your participation.

Section I: General Information

1. Gender

Male [ ]

Female [ ]

2. Indicate the highest level of education

Diploma Level [ ]

Undergraduate Level [ ]

Doctorate Level [ ]

3. How long have you been working here?

Less than 1 year [ ]

1-5 years [ ]

6-10 years [ ]

Above 10 years [ ]

Section II: E-Tendering and Supply Chain Performance

Please indicate your level of agreement with the following statements by ticking where appropriate on effect of e-tendering on supply chain performance in food manufacturing firms.

Statement	**SA**	**A**	**U**	**D**	**SD**
Every year, planning and submission of procurement is done online with the aim of attracting tendering process					
All purchase requisitions are online for tendering					
Managers have integrated the use of e-tendering in all the processes related with procurement.					
e-tendering provides ease of access to market structures					
E-tendering promotes good supplier relationship					

Section III: E-Invoicing and Supply Chain Performance

Please indicate your level of agreement with the following statements by ticking where appropriate on effect of e-invoicing on supply chain performance in food manufacturing firms.

Statement	SA	A	U	D	SD
E-invoicing enables reduction in payment time					
E-invoicing promotes security of financial data					
The cost of the infrastructure is reduced in every single transacting when there is a rise in volume of transactions					
E-invoicing increases speed of communication for repayment purposes					
E-invoicing enhances reliability of service delivery					

Section IV: E-Payment and Supply Chain Performance

Please indicate your level of agreement with the following statements by ticking where appropriate on effect of e-payment have on supply chain performance in food manufacturing firms.

Statement	SA	A	U	D	SD
There is low cost of procurement transaction for repayment purposes					
All store issuing are made online					
E-payment offers total convenience					

The parties to online procurement have high level of trust on online payment systems					
The online payment eliminates agency costs					

Section V: Supply Chain Performance in Food manufacturing firms

Please indicate your level of agreement with the following statements by ticking where appropriate.

Statement	**SA**	**A**	**U**	**D**	**SD**
E-procurement application reduces time from requisition to issuing					
Stock out is not experienced whenever e-procurement application is used					
E-Procurement system is well integrated with the other systems in operations to enhance performance					

Thank you for your contributions