



UNIVERSITY OF NAIROBI

SCHOOL OF COMPUTING AND INFORMATICS

**BARRIERS TO E-PROCUREMENT ADOPTION BY
SMALL AND MEDIUM ENTERPRISES IN
MACHAKOS COUNTY**

ANGELLINE MUKULU NGUI

P54/79035/2015

OCTOBER, 2016

A project report submitted to University of Nairobi in partial fulfillment of the requirement for the award of a Master of Science in Information Technology Management Degree.

DECLARATION

This project is my original work and to the best of my knowledge, this research work has not been submitted for any other award in any University.

Sign: _____

Date: _____

Angelline Mukulu Ngui

P58/79035/2015

This project report has been submitted in partial fulfillment of the requirement of the Master of Science Degree in Information Technology Management of the University of Nairobi with my approval as the University supervisor.

Sign: _____

Date: _____

Christopher A. Moturi

Deputy Director

School of Computing and Informatics

ACKNOWLEDGEMENTS

I'm grateful to the Almighty God for his elegance all through this scholarly adventure and for granting me courage, great well being, knowledge and motivation that was fundamental to carry out this project.

Especially thankful to my supervisor Mr. Christopher A. Moturi for his significant direction and support. I thank him for his inspiration, encouragement and constructive criticism throughout this research process. My sincere gratitude also goes to the panelists Professor Peter Wagacha, Dr. Daniel Orwa and Dr. Samuel Ruhiu who moderated this project and for their suggestions, comments and guidance.

I'm thankful to my parents Mr. & Mrs. Joshua Muoki, Sisters; Dr. Dianah Muchai, Christine Kalondu, Caroline Muoki and Rosalind Mwangela; Brothers; Caleb Mutinda, Dr. Joseph Muchai, Robert Muoki, Dalmas Mwangela and Emmanuel Mutisya for the continuous support and encouragement throughout the study.

I also register my gratitude to Paul Mutinda and colleagues whose diverse contributions enabled me complete this project successfully.

DEDICATION

This work is highly dedicated to my parents Mr. & Mrs. Joshua Muoki for their persevering backing and support in my studies and to all my family members for their inspiration and prayers. Your support brought me this far.

ABSTRACT

SME's are a significant part of many countries' economies and by embracing the change brought on by the internet and e-commerce applications they may achieve productivity gains. However, in developing countries research geared towards the adoption and application of e-procurement systems appears severely neglected in procurement literature. The target of the study was to establish the key barriers to e-procurement adoption among SME's in Kenya and establish a guideline that will help mitigate those barriers. Companies are faced with the challenge of considering several perspectives before choosing to contribute and harness the new innovation. This has contributed to the low level of e-procurement adoption. A self-administered questionnaire was used to gather information from 80 owners of SME's in Machakos County. The information was analyzed using SPSS both quantitatively and qualitatively. The outcomes uncovered that technological barriers were the key factor to e-procurement adoption amongst SME's in Machakos County. A guideline was developed to guide the SME's in adopting e-procurement.

Key Words

ICT Adoption, e-procurement, small and medium enterprises, IT Adoption and TOE, organizational barriers.

TABLE OF CONTENTS

DECLARATION	i
ACKNOWLEDGEMENTS	ii
DEDICATION	iii
ABSTRACT	iv
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF ABBREVIATIONS	xi
DEFINITION OF TERMS	xii
CHAPTER ONE	1
INTRODUCTION	1
1.1 Background of the Study	1
1.2 Statement of the Problem	3
1.3 Objective of the Study	4
1.3.1 General Objectives	4
1.3.2 Specific Objectives	4
1.4 Research Questions	4
1.5 Significance of the Study	4
1.6 Scope of the Study	5
CHAPTER TWO	6
LITERATURE REVIEW	6

2.1 Introduction	6
2.2 E-Procurement.....	6
2.3 SME's and E-Procurement Adoption.....	6
2.4 Adoption of E-procurement in Kenya.....	9
2.5 Barriers to Adoption of E-Procurement	10
2.6 E-Procurement Adoption Models	11
2.6.1 Electronic Data Interchange (EDI) Adoption Model	11
2.6.2 Technology Acceptance Model (TAM)	12
2.6.3 Technology, Organization and Environment Framework (TOE).....	13
2.6.4 High Level Research Model	15
2.7 Conceptual Framework	17
2.7.1 Organizational Factors.....	18
2.7.2 Environmental Factors.....	19
2.7.3 Technological Factors.....	20
2.8 Research Gap.....	20
CHAPTER THREE	22
RESEARCH METHODOLOGY.....	22
3.1 Introduction	22
3.2 Research Design.....	22
3.3 Population of the Study.....	22
3.4 Sampling Design	23

3.5 Sample Size	23
3.6 Data Collection.....	24
3.7 Data Collection Process	24
3.8 Pilot Testing	24
3.8.1 Result of the Pilot Study.....	25
3.9 Data Analysis and Presentation.....	26
3.10 Operationalization of the Research Variables	27
3.10.1 Operationalization of Variables.....	27
3.11 Ethical Considerations.....	28
CHAPTER FOUR.....	29
DATA PRESENTATION AND FINDINGS	29
4.1 Introduction	29
4.1.2 Response Rate.....	29
4.2 Demographic Results	30
4.3 Technological Barrier to E-procurement by SME's	32
4.4 Organizational Barrier to E-procurement Adoption.....	33
4.5 Environmental Barrier to E-procurement Adoption Among SME's	34
4.6 Regression	37
4.7 ANOVA	37
4.8 Coefficient of Regression.....	38
CHAPTER FIVE	39

SUMMARY, CONCLUSION AND RECOMMENDATION	39
5.1 Introduction	39
5.2 Summary of Findings	39
5.3 Conclusion.....	40
5.3.1 Technical Barrier to Adoption of E-procurement Among SME’s	40
5.3.2 Organizational Barriers to Adoption of E-procurement by SME’s.....	40
5.3.3 Environmental Barriers to Adoption of E-procurement by SME’s.....	40
5.4 Recommendation.....	40
5.6 Limitation of the Research	41
REFERENCES	42
APPENDICES	47
Appendix I: Guideline on Smart use of E-procurement for SMEs in the Counties	47
Appendix II: Introductory Letter.....	52
Appendix III: Questionnaire.....	53

LIST OF TABLES

Table 1: Pilot Study Results.....	25
Table 2: Response Rate.....	29
Table 3: Demographics.....	30
Table 4: Technological Barrier to E-procurement by SMEs	32
Table 5: Organizational Barriers to Adoption of E-procurement	33
Table 6: Environmental Barrier to E-procurement Adoption Among SMEs	34
Table 7: Model Summary for all the Variables	37
Table 8: ANOVA for all the Variables	37

LIST OF FIGURES

Figure 1: Electronic Data Interchange (EDI) Adoption Model (Source: Iacovou et al (1995)) ...	11
Figure 2: Technology Acceptance Model (TAM) (Source: Hamad (2014)	12
Figure 3: Technology, Organization and Environment Framework (TOE) (Source: Tornatzky and Fleischer 1990))	13
Figure 4: High Level Research Model (Source: (Hassan 2013)).....	15

LIST OF ABBREVIATIONS

ERP	Enterprise Resource Planning
EDI	Electronic Data Interchange
ICT	Information and Communications Technology
IOSs	Inter-organizational Systems
SMEs	Small and Medium Enterprises
TAM	Technology Acceptance Model
TOE	Technology, Organization, and Environment Framework

DEFINITION OF TERMS

Technological Context: This refers to the organization of the current innovations being used inside the organization and new relevant technologies to the organization. The three factors that influence adoption decisions are relative advantage, compatibility and complexity.

Relative Advantage: Organizations adopt will only use a new innovation if their organization will perceive potential benefits of using the innovation.

Compatibility: If organizations existing practices and values are compatible then it's when they can use the innovation.

Complexity: Difficulty in understanding new innovation increases risk associated with adoption thus resulting in slow recognition of the value of the technology, fear of failure and resistance.

Organizational Context: This refers to the organizations scope, size, and measure of slack assets available inside or inward aspect of the organization. The factors include top management support and employee knowledge.

Management Support: Top management support to an organization is critical to ensure that resources anticipated to embrace an innovation are available and to overcome resistance to change and frustration in implementation.

Employee Knowledge: Knowledge about innovation empowers organization to oversee viably the dangers associated with putting resources into a technology. Insufficient learning about technology frustrates technology implementation and utilization.

Environmental Context: This refers to the outside environment in which an organization does its business including different organizations it works together with and the vital standards and controls. The factors are partner readiness and external pressures.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

It is common knowledge that SME's are the pillars of the modern market economies; they therefore play a critical role especially in developing countries. Research has shown that SME's form a good percentage of business populace in Most countries. It represents 90% of the business populace. They therefore play a key role in driving maintainable monetary development and occupation creation.

Adebayo & Evans (2015) stressed that SME's grow a few times speedier when they embrace technology. Defining small and medium enterprises (SME's) is not a simple task. This is on account of there are very different definitions as there are interlocutors. Given such SME's reality and size can a great deal from sector to sector, or as indicated by economy and time span considered, a solitary definition is difficult. Actually, there is no commonly acknowledged meaning of SME's; commonly they are portrayed with number of representatives or yearly turnover. In fact, definitions vary with the level of specific economy in thought. For instance, in developed nations, as in Europe or America, where there is a bigger variety in big business sorts, little estimated organization can be viewed as medium or huge in less created nations like in Kenya. Universally, it is just European Union that have made a few strides in receiving a typical acknowledged meaning of SME's, however there are still level headed discussion among nations in the piece. The Kenya National Small Business Act characterizes SME's by making utilization of three parameters, specifically: number of workers, yearly turnover and gross resources (barring settled resources) and this is the definition that we will receive all through this paper.

The current condition of e-procurement in SME's has been studied, yet SME's play an imperative part in the worldwide economy and in supply chains (Manuel and Duarte, 2015). A study done on factors influencing public procurement, over free primary education programme in Kenya, with reference to Machakos County revealed that staff training technology, provider administration relations and the authoritative structure influence implementation of powerful procurement practices in numerous government funded schools (Philip et al., 2016). SME's are a

critical part of many countries' economies and by embracing the change brought on by the web and web based business applications they may accomplish profitability picks up. SME's play vital roles in supporting national money related change, such parts of SME's can be seen in different perspectives including work retention, income generation and dispersion, poverty easing, training ground for the improvement and redesigning enterprise abilities and basic vehicles for progressing forward and in switch linkages in topographically and financially varying portions of the economy in various countries (Afande and Uk, 2015).

SME's stay as one of the basic monetary donors in around the world. SME's make up 99.8 percent of non-money related enterprises; contributing 58 percent of area's gross value added (GVA) and gave practically 67 percent of occupations (Fauziah et al., 2013). Supporting SME's through purchasing policies and actions has received increasing attention from UK government thus limited attention has been given the role of public procurement as a small business support policy compared with other avenues such as accessing finance and advice (Loader, 2013). The SME's are increasing in their commitment to the national economy as far as the riches creation and number of work openings.

SME's dedication to the national economy to the extent the riches creation and number of work openings. In developed countries, SME's have historically assumed a crucial part in making employments, prodding advancements, and making new items hence added to financial development (Kitisha, 2013). Considering these encounters, Kenya ought not to disregard on the significance of advancing SME's in a similar respect in this way expelling a few obstacles for SME's to thrive. One of the principle drivers of the rising pattern of SME's executing Enterprise Resource Planning (ERP) frameworks is the weight from the huge players. ERP frameworks empower order processing to be computerized and performance to be observed ongoing. Numerous SME's should be furnished with this sort of innovation to give a superior and focused support of their clients. This innovation turns out to be effortlessly available because of the coming of the Internet (Magure, 2006).

In developing countries, for instance, Kenya, it lacks comprehensive technology progression and benchmarks to actualize procurement. The communities too do not have the initiative in changing practices to embrace e-procurement. Subsequently, colossal endeavors and collaboration are required among government, system engineers and sellers, SME's proprietors

and laborers to accomplish these limits, this has required the necessity for this study (Magure, 2006). The study went for researching the adoption of e-procurement and its impacts on small and medium enterprises in Machakos County.

The study was coordinated on SMEs inside Machakos County in Eastern part of Kenya. Machakos County is situated in Eastern Province and constitutes 8 Districts (Machakos Town, Masii, Yatta, Kangundo, Kathiani, Mwala, Matungulu and Mavoko). The County has a height of 1000 – 1600 meters above ocean level. It has an aggregate populace of 1,098,584 individuals, 264,500 households and spreads an area of 6,208 SQ KM. The populace thickness is 177 people for every SQ KM. The Akamba individuals are the prevailing habitats of Machakos County (Kimathi, 2015). The County has been chosen as the home of up and coming Konza Technology City because of its proximity to Machakos Town, good infrastructure and accessibility of expansive land.

1.2 Statement of the Problem

Adoption of e-procurement is thought to be a way to empower organizations to contend on a worldwide scale, with enhanced effectiveness, and nearer client and provider connections. It is hence pleasant that SMEs should consider Information and Communication Technology (ICT) as an important approach in business to grasp high ground from the overall markets. Also, ICT is an advantage of SME's which may help them to get to information remembering the true objective to update its power. Today's business world has been significantly affected by (ICT) and the determination of ICT among business far reaching. Appropriation of ICT especially in procurement, organization is rapidly changing overall era, work, business procedures and trade and use plans in and among undertakings and buyers.

Notwithstanding the way that studies have been led relating with the adoption of e-procurement by SME's around the globe, the vast majority of these studies are moved in generally all around created economies, for example, China and America. A couple contemplates have likewise been embraced in creating nations like Kenya and the majority of these are focusing on the e-procurement in broad daylight area rather than private elements. Adoption of e-procurement has been growing especially among countries with well-developed infrastructure. Kenya has not been an exception especially with landing of fiber optic cable. However, there has been slow uptake in e-procurement by SMEs and even some of the firms have dropped using the system.

Therefore, this study aimed at investigating the barriers to e-procurement adoption among Small and Medium Enterprises operations in Machakos County Kenya.

1.3 Objective of the Study

1.3.1 General Objectives

The fundamental goal of the study was to investigate e-procurement adoption and its effect on Small and Medium Enterprises operations in Machakos County Kenya.

1.3.2 Specific Objectives

1. To establish how technological barrier hinder adoption of e-procurement by SME's in Machakos County
2. To establish how organizational barriers hinder adoption of e-procurements by SME's in Machakos County
3. To establish how environmental barriers hinder adoption of e-procurements by SME's in Machakos County
4. To create a guideline to help SMEs in e-procurement adoption

1.4 Research Questions

1. What are the technological barriers that hinder adoption of E-procurement by SME's in Machakos County?
2. What are the organizational barriers that hinder adoption of e-procurements by SME's in Machakos County?
3. What are the environmental barriers that hinder adoption of e-procurements by SME's in Machakos County?
4. What guidelines can be created to mitigate barriers to e-procurement adoption?

1.5 Significance of the Study

The discoveries of this study will be of great significance to SME's in Machakos County. The findings will address the need to set policies on SME's, owners of the businesses will get a guide of the best procedures in e-procurement adoption, scholars will gain knowledge on what has been done and researchers will establish the gap in e-procurement adoption and carry out further

research. It will also enable SME's to understand how different approaches taken by the administration influence the utilization of e-procurement therefore guaranteeing they adjust between the way to deal with control asset imperatives and specialized skills required. The study will be carried out at Machakos County because it's a growing county and historically was well known as a trading center for the colonial government, also it has small and medium industries like cement production, steel rolling mills and others. It is a hub for many foreign investors. The findings of this study are of great significance to SME's in Kenya. The findings will address barriers to e-procurement adoption amongst SME's in Kenya.

1.6 Scope of the Study

The study fixated on identifying the key barriers to e-procurement adoption amongst SMEs Kenya and specifically in Machakos County. Different SMEs with 1 to 50 employees located in Mulolongo and Machakos town were used to carry out the study. The study will concentrate only on SME's within Machakos County.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section covers the past studies done linking to e-procurement adoption, critique of existing literature, e-procurement adoption models and conceptual framework.

2.2 E-Procurement

E-procurement is an online system that can streamline the procurement process (Rotchanakitumnuai, 2013). In the computerized era, government utilizes the web to convey benefits and to speak with residents and organizations. E-procurement refers to the use of Web based Information and Communication Technologies (ICTs) to carry individual or all periods of the securing strategy including look, sourcing, negotiation, asking for, receipt, and post-purchase review (Mose, Njihia, and Magutu, 2013).

The pool of examines at on hierarchical level in deterrents of e-procurement adoption or ICT instruments adoption in SMEs, regardless, is much greater. In this way surveying investigates potential limits for e-procurement implementation among SMEs can be viewed. In view of past examines, the variables adding to boundaries will rely on upon numerous elements, including outside elements, for example, technology, infrastructure, legislation, environment and inner elements, for example, resource constraints and organizational and management qualities (Eei, Husain, and Mustaffa, 2002).

2.3 SME's and E-Procurement Adoption

Shemi (2012) found that, "SME's are a gigantic section of various economies on the planet. This is an immediate consequence of the dedication they make in making business and encouraging territorial progression, thus influencing on the economy of their countries". The headway of SME's is on the inspiration of various countries and nations over the globe. Quick progressions in Information and Communication Technologies (ICT), especially the Web, have understood a

significant measure of changes on the planet, both in developed and developing countries. Prodromos & Dimitrios (2016), “on factors affecting e-business adoption in SME’s stated that SME’s are considered as the backbone of every modern economy, while governments around the globe are trying to push SME’s towards modernization through funding programmes and other initiatives”. On the other hand, the level of education of CEOs plays a crucial part in the adoption decision and the evolution of e-business processes. Many companies perceive e-business as an opportunity to gain competitive advantage, while others consider it as a burden and claim that it is out of their business scope.

Contemplates done by Gupta and Narain, (2011) on adoption of e-procurement in Indian organizations were data was accumulated from 36 Indian organizations and found that e-procurement has transformed into the latest way of doing business. For reasons of centered on environment, government controls and favorable circumstances offered by e-procurement, more organizations are going in for its adoption. Regardless, there are a couple issues, for instance, security stresses in cash related trades that ought to be tended to for quick dispersion of e-procurement. The delegates should be made aware of the focal points that e-procurement can offer if executed suitably. Fears rising out of any reason in the brains of the specialists ought to be cleared.

In a study done by Shemi (2012), “to examine the factors that impact web business adoption by SME's in the developing country setting of Botswana found that the effect of the nearby business environment has had a direction of the way of internet business selection in the picked SME's, particularly the low correspondence of foundations that are planned to support online business, and the double of part of the government in empowering and making an empowering domain and meanwhile going about as a business accomplice to the SME's”. Embracing e-procurement has not been simple for SME's around the world, mostly on account of always showing signs of change in field of information systems and the moving needs of nearby and overall business by and large. Past investigations of ICT and e-procurement adoption report that SME's in emerging nations for the most part have not exploited the force of the internet to develop their business beyond traditional outskirts aside from in the utilization of simple technologies, for example, electronic mail. There is still little learning about SME's and web based business in developing nations in contrast with developed nations thus this study helps in filling the gap.

Moertini (2012), in study on, "SME's in utilizing Business - Business e-commerce to go global in Indonesian SME's established that, thousands of Indonesian SME's had joined the marketplace websites, nonetheless, in spite of the issues existed, the writer had not found any exploration result connected with the utilization of B2B commercial center by Indonesian SME's therefore utilized this information to conduct research thus ; identifying the research issues and questions, performing writing study concerning the usage of online business in developing countries including Indonesia and looking over worldwide B2B commercial center sites". In the study the issues identified with Indonesian SME's organization profiles was abridged as: - the profile not genuinely developed, numerous fragmented, brief and containing few sentences, many unprofessionally written with poor English and contents not well thought, poor methodical arrangement of the profile presentation, most profiles ugly, content not landing the business uniqueness, many profiles not providing organization site URL in this manner can be respected no owning an organization site.

On assessing the data on every item posted in the e-commercial center sites the discoveries were numerous SME's don't set up the item data well, the items data deficient, lack of attractive pictures, gave poor English, item costs unattractive, lack of adequate search engine, item depictions inadequate and absence of sight and sound, (for example, video) content and indistinct pictures. The creator proposed two gatherings of suggestions Indonesian SME's and the administration or affiliations expected to develop the SME's and proposed the following steps for using B2B marketplace websites, set up the SME to embrace internet business, create organization site, join B2B marketplace websites and communicate viably by means of electronic media, conducting training's and education on the best way to discuss successfully with potential purchasers or global merchants, give help of how to receive web based business successfully and give sufficient ICT framework with the end goal that online business can be adopted by the Indonesian SME's.

2.4 Adoption of E-procurement in Kenya

With a particular true objective to meet the requests of dynamicity and the more focused nature of the advanced business world, the buying method in organizations has been transformed from a standard administrative nature to a more key business work (Altayyar, 2009). IT has been the essential driver in changing business acquiring practices into a more esteemed included key business work. The two primary reasons why organizations are hoping to actualize IT are on the grounds that it makes the buying procedure more time effective and less expensive. It is additionally proved that numerous Kenyan family based SME's are as yet working their business in manual ways. However SME's which have put resources into ICT systems implement and come up short keep up these systems effectively. Also, ICT in Kenya is confronting enormous difficulties because of the moderate reception of innovation by SME's in Kenya. SME's must figure out how to embrace innovation to build their worldwide aggressiveness. To meet this objective, there is mounting weight for SME's to all the more completely grasp ICT and e-business techniques because, in total, they are enormous purchasers, huge vendors, huge pioneers and, most essential politically, big employers (Taylor et al., 2006).

The developing issues in e-procurement are a testing assignment for SME's because of their little size and restricted assets. Absence of care and its effects for organizations execution are the purposes for SME's' direct progress towards e-procurement use. The use of e-procurement in Kenya confronts various troubles; - inconvenience is the absence of data and mindfulness about e-procurement and its results for company's performance. There is absence of support from system engineers and vendors leading to failure of e-procurement system progression by SME's. The issue of security has been a worry to such a variety of SME's fearing hackers interfering with their systems and tampering with their own information particularly on electronic payment.

Most Kenyan SME's attempt to oversee procurement through an inefficient blend of labor-intensive, manual procedures, including paper-based record keeping, telephone calls, messages and faxes. This is tedious approach prompts to different issues, for example, constrained budgetary reporting, and absence of effortlessly open data, low-level seller consistence, and incessant unapproved spending. In any case, there are e-obtainment arrangements accessible that can curb these issues.

2.5 Barriers to Adoption of E-Procurement

Gupta and Narain (2011), “on variables affecting adoption of e-procurement found that the boundaries to e-procurement adoption was because of absence of specialized learning and abilities, absence of capital, absence of specialized devices, and need high talented individuals”. So also, individuals' imperviousness to change and a trouble and responsibility from top administration is different boundaries to e-procurement adoption.

Zaied (2012), “on obstructions to online business adoption in Egyptian SME’s, stated that the barriers to e-commerce adoption was due to social - culture barriers, technical barriers, and economical barriers, political barriers, and organizational barriers, legal and regulatory barriers”. Moreover, they found that online business can possibly incredibly enhance how undertaking works inside and how it serves its clients, in this way internet business is substantially more a device for enhancing cost-quality proportions in SME's services. They also found out that most of SME’s adopted basic applications, e-commerce technologies rather than e-commerce platform to enable online transactions therefore the findings implied that more efforts are needed to help encourage SME’s in Egypt to speed up e-commerce adoption.

In a report done by Vladimirov (2014), “on tourism creation research towards an understanding of e-procurement adoption utilizing a case study approach, in-depth interviews were directed to six senior procurement representatives in various classes of hotels identifying six main factors:- technical factors, perceived benefits, conflicts between hotel owners and management, imperviousness to change, product diversity and rumors”. Vladimirov (2014), “identifies the primary variables impacting the e-business adoption by the small tourism firms in Bulgaria as being environmental pressure, organizational readiness and positive desires will probably improve the e-business selection”.

2.6 E-Procurement Adoption Models

2.6.1 Electronic Data Interchange (EDI) Adoption Model

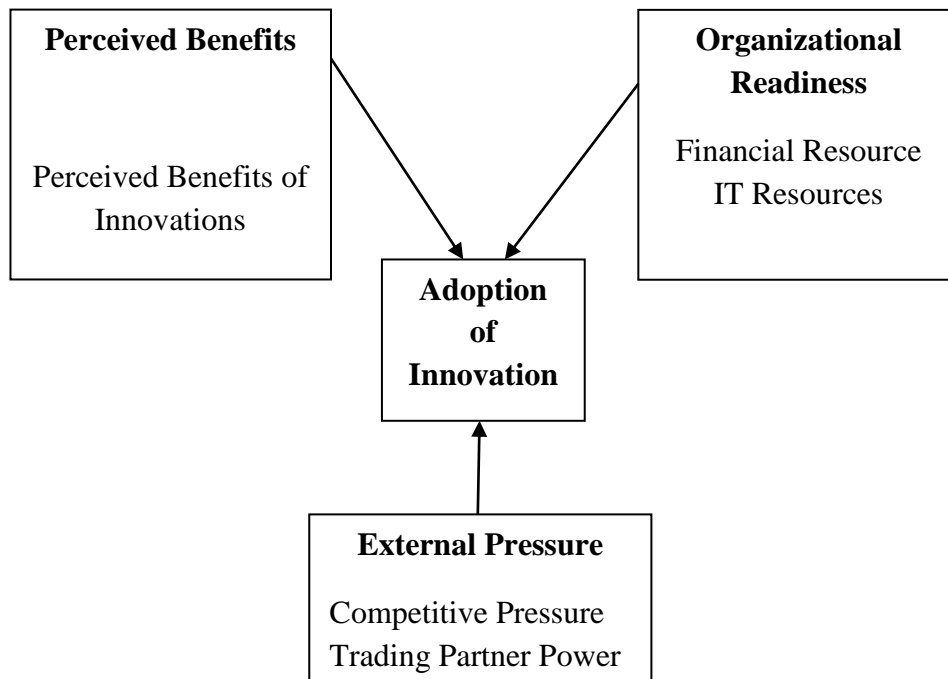


Figure 1: Electronic Data Interchange (EDI) Adoption Model (Source: Iacovou et al (1995))

Iacovou et al. (1995), “studied Inter-Organizational Systems (IOSs) qualities that impact firms to adopt IT innovations with regards to EDI adoption”. Their structure was appropriate to clarify the selection of Inter-Organizational Systems (IOS). Perceived benefits are an alternate variable from TOE structure, though organizational status is a mix of the technology and organization setting of the TOE system. It depended on three components; perceived benefits, organizational readiness and external pressure. This model concentrated on qualities that impact firms to adopt IT innovations while the study expected to examine e-procurement adoption and its impact on SME's in Kenya.

2.6.2 Technology Acceptance Model (TAM)

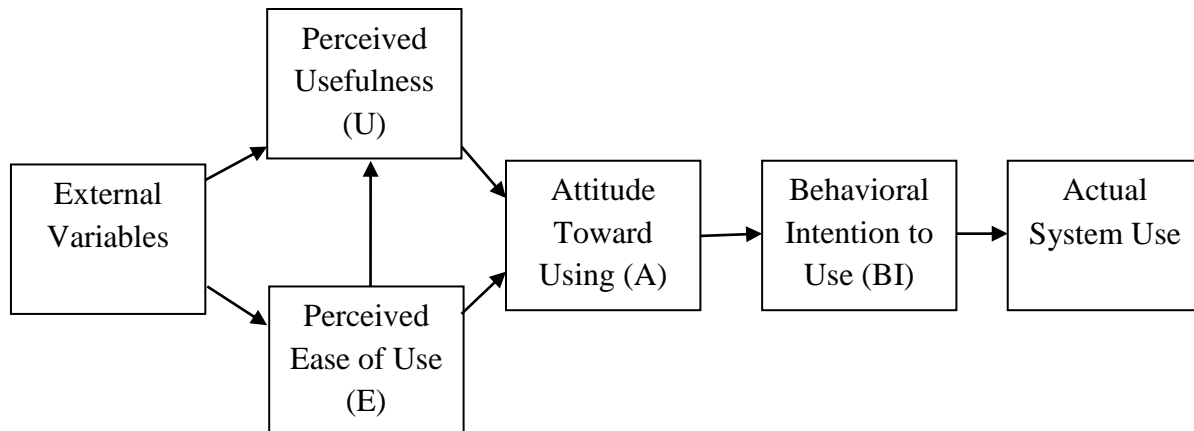


Figure 2: Technology Acceptance Model (TAM) (Source: Hamad (2014))

Hamad (2014), “ said the Technology Acceptance Model (TAM) was used to determine the factors causing the adoption of IT to be either accepted or rejected”. The first form of the Technology Acceptance Model (TAM) is an adjustment of the Theory of Reasoned Action (TRA), this was made particularly for modeling the acceptance of adopting technology. The model tries to explain the decisions around the adoption of technology by considering the effect of external elements on attitudes; internal beliefs; and intentions. Through studies, confirmed that, compared to perceived ease of use, perceived usefulness was linked more strongly to the adoption of IT and usage because, in order to gain the benefits from adopting IT, organizations might be willing to adopt and make use of more complicated technology. This reveals that TAM can contribute to examining the effects of technological features (e.g. perceived usefulness, perceived ease of use) on the process of adopting B2B e-commerce. However, in adopting IT (e.g. B2B e-commerce), it ignores the role of organizational features and environmental features. Therefore, this model was not used since it focused on factors causing adoption while the study was investigating barriers to e-procurement adoption and its effects to SME’s.

2.6.3 Technology, Organization and Environment Framework (TOE)

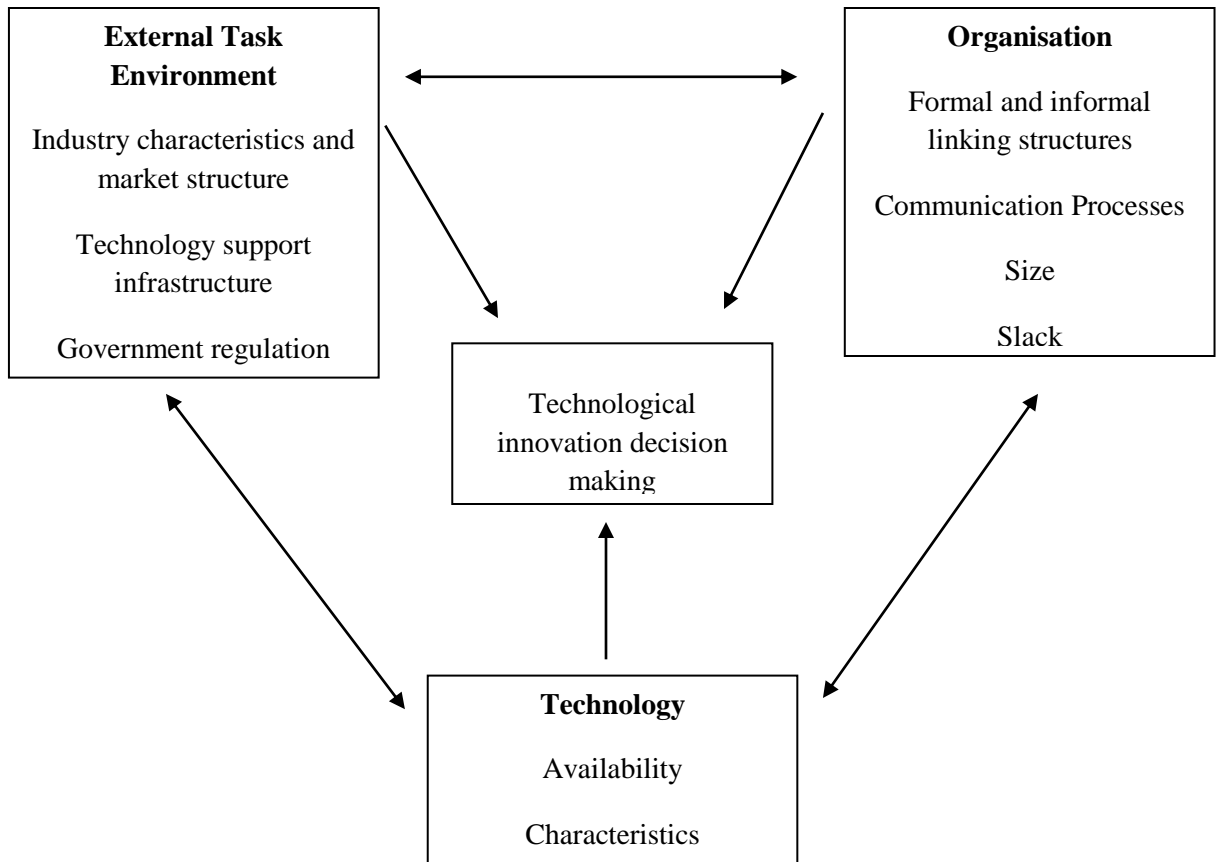


Figure 3: Technology, Organization and Environment Framework (TOE) (Source: Tornatzky and Fleischer 1990))

In their survey of IT adoption models, Oliveira and Martins (2010), “broke down studies that have utilized the TOE structure either all alone or in combination with different theories such diffusion of Innovation (DOI) theory”. By adopting the TOE framework as a theoretical base Alshamaila, Papagiannidis & Li (2013), “found the main factors that play a role in SME adoption of cloud services in England were;- relative advantage, uncertainty, geo-restriction, compatibility, trialability, size, top management support, prior experience, innovativeness, industry, market scope, supplier efforts and external computing support”. Ghobakhloo, Arias-Aranda, & Benitez-Amado (2011), “used TOE and found that adoption ecommerce in SME’s in Iran is influenced by perceived relative advantage, perceived compatibility, CEO’s innovativeness, information intensity, buyer/supplier pressure, support from technology vendors, and competition”. Ifinedo (2011), “applied TOE and found that perceived benefits, management

commitment/support, and external pressure are significant predictors of Internet/e-business technologies acceptance in Canada's SME's IEBT". However, their results did not show that organizational IT competence, IS vendor support, and availability of financial support positively influence Internet/e-business technologies acceptance in the sampled SME.

By using TOE, Wen & Chen (2010) confirmed that, "technology readiness and competition intensity have positive impact, firm size has negative effect on e-business value, but financial resource and regulatory environment have no impact on e-business value". Low, Chen & Wu (2011) used the TOE framework, "to investigate the factors that affect the adoption of cloud computing by firms the high-tech firms in Taiwan and found that relative advantage, top management support, firm size, competitive pressure, and trading partner pressure characteristics have a significant effect on the adoption of cloud computing".

Pan & Jang (2008) substantiate the usefulness the TOE framework by using it to examine the factors affect the choice to adopt ERP in Taiwan's communications industry. They established the following; - technology readiness, size, perceived barriers, production and operations enhancements. TOE framework includes the environment context making it better to demonstrate intra-firm innovation technology adoption; therefore, considered this model to be more exhaustive. The TOE likewise has an obviously theoretical basis, steady empirical support and the possible of utilization to e-procurement adoption.

2.6.4 High Level Research Model

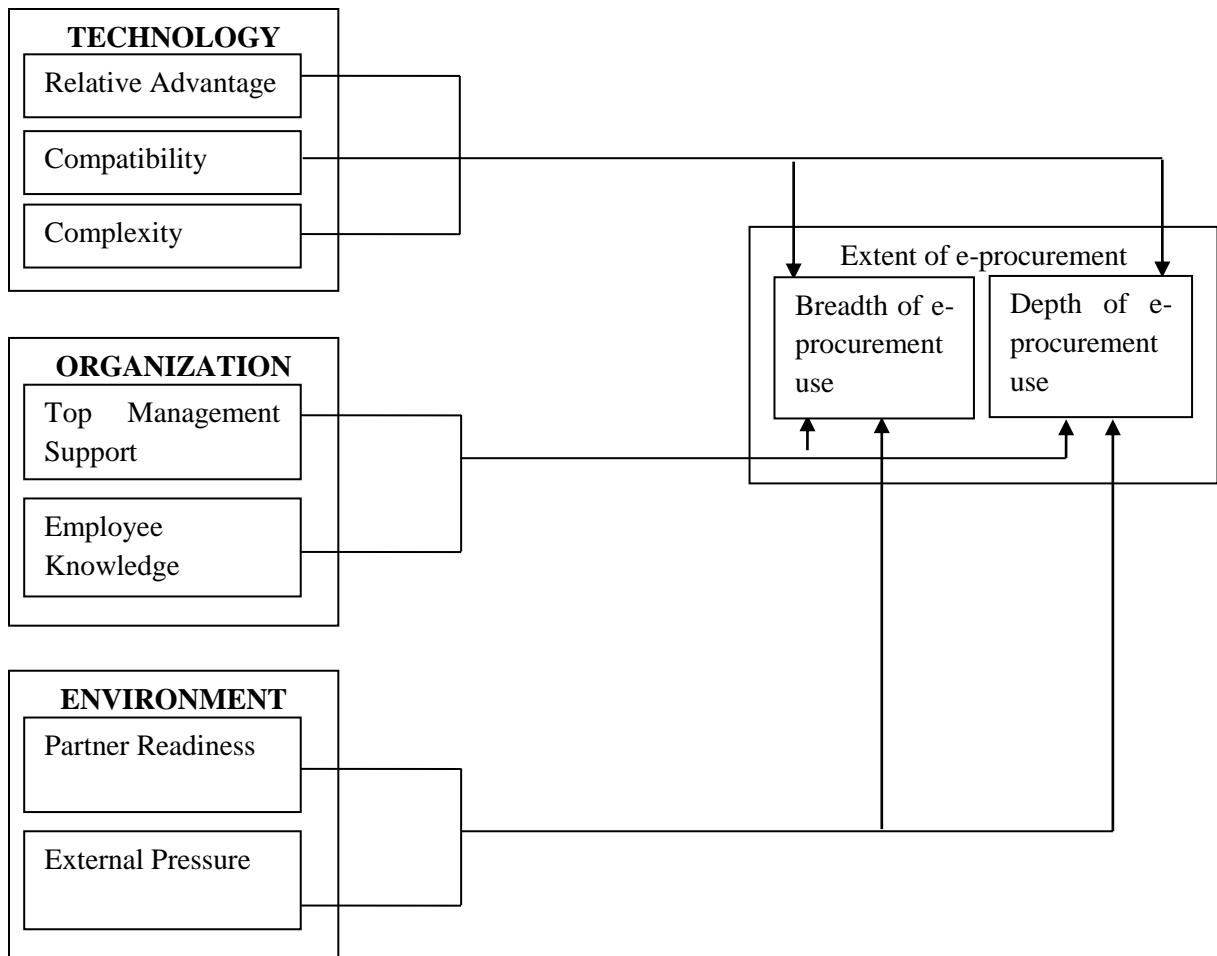


Figure 4: High Level Research Model (Source: (Hassan 2013))

Dependent Variable: Extent of E-Procurement Use as Breadth and Depth

The extent of e-procurement utilization refers to the degree to which organizations utilize e-procurement as far as the scope of the e-procurement functionalities utilization is concerned. Consequently, broadness represents richness and complexity of e-procurement practice within an organization and depth shows the degree to which the center business forms at the organization depend on e-procurement.

Technological Context: This refers to the organization of the current advancements being used inside the organization and new pertinent technologies significant to the organization. The three elements relative favorable position, similarity and intricacy impact reception choices.

Relative Advantage: Organizations adopt then use a new innovation only if their organization will perceive potential benefits of using the innovation.

Compatibility: Organizations will just adopt and utilize an innovation when it is compatible with their current practices and values.

Complexity: Difficulty in understanding new innovation increases risk associated with adoption thus resulting in slow recognition of the value of the technology, fear of failure and resistance.

Organizational Context: This refers to the organization's scope, size, and measure of slack assets accessible inside or inner part of the organization. The elements incorporate top administration support and worker information.

Management Support: Support from top management is crucial to guarantee that resources required for adoption of technology or expand their use are accessible and to defeat imperviousness to change. The absence management backing will bring failure in implementation.

Employee Knowledge: Lack of employee knowledge deters implementation of technology and use.

Environmental Context: It refers to the outer environment in which an organization leads its business including different organization it connects with and the important gauges and controls. The factors are partner readiness and external pressures.

Partner Readiness: E-procurement functions are accessible only when both purchasing organizations and selling organizations execute the significant technology and utilize it effectively. The advantage can be acknowledged by an organization only if its accomplices are prepared to take part in data trades. Partner readiness in terms of supplier issues is a barrier to e-procurement.

External Pressure: Organizations may adopt and utilize innovation to obtain competitive advantage thus effects on cost and sustainability of the business due to high cost to maintain the competitiveness and partner relations. This model was not selected since it looked on the extent

of e-procurement utilization both breadth and depth and also some factors like political factors and economic factors were not been looked into.

2.7 Conceptual Framework

This part of research provide a conceptual framework coupled with theoretical overview explaining main factors, constructs or variables, and the assumed relationships between them in order to give better understanding of the research. This study examined three factors as independent variables that influence project success. In studying the readiness of the County government in embracing this system, available literature organization matters, technological factors and environmental issues that surround adoption of e-procurement were studied. The study is conceptualized as follows:

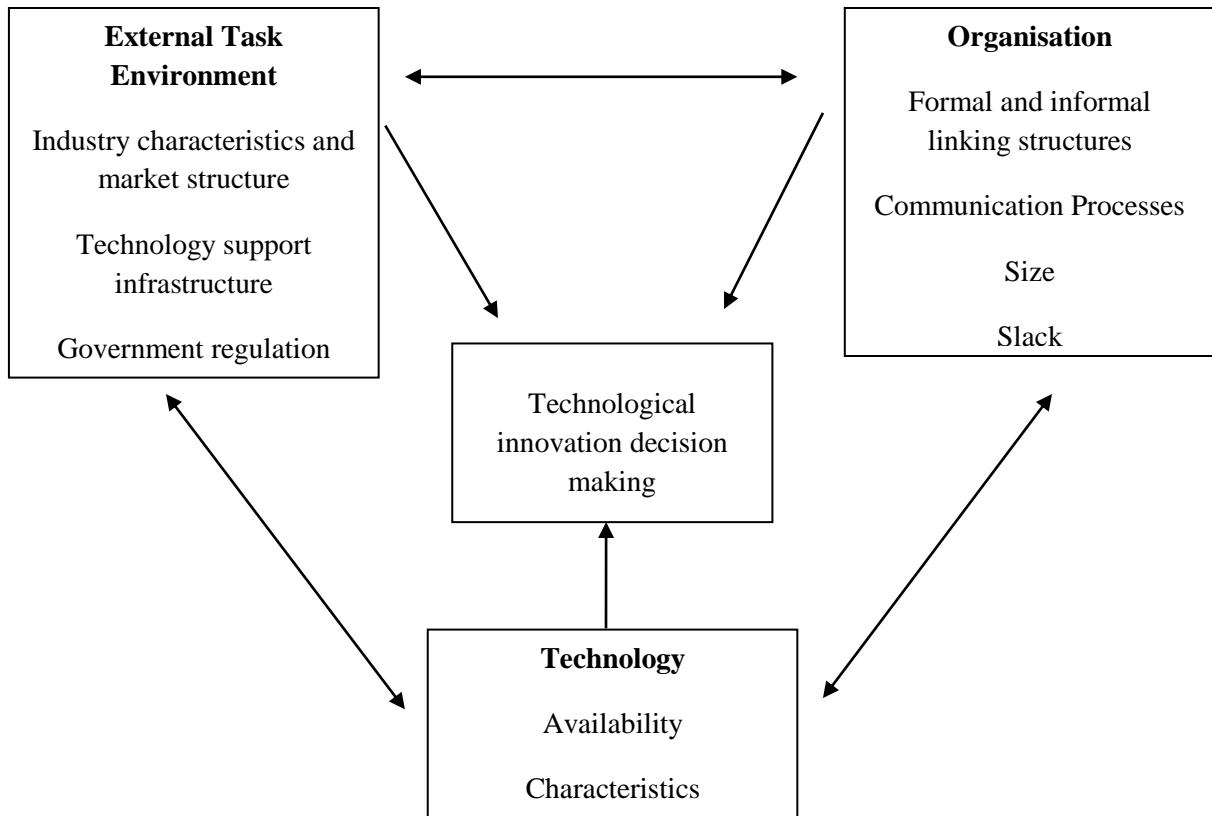


Figure 2.4: Technology, Organization, and Environment Framework (TOE) – (Source: Tornatzky and Fleischer (1990))

2.7.1 Organizational Factors

The empirical results supporting the impact of organizational qualities recommend that the determinants of e-procurement adoption are employee's knowledge to e-procurement Wen and Chen (2010) and the size of the enterprise Oliveira and Martins (2010). These outcomes are unlike to discoveries reported by Joen, et al. (2006) with respect to the representatives' information of e-procurement and to reported results by Vilaseca-Requena, et al. (2007) as for the resources of the enterprise.

Huy (2012), "in a study on the importance of organizational determinants as components of adoption additionally found that representatives' information of web based business, the size of the venture, and demeanors of supervisors towards advancement were sure and measurably noteworthy". Different discoveries additionally affirm the positive relationship between the state of mind of directors towards development and selection (Al-Qirim, 2007), yet the relationship is not critical with respect to learning of the new data advances of e-acquirement. According to Vladimirov (2014), "the level of education of the owner/manager has a positive and significant relationship with the likelihood of adopting an innovation". Similarly, Oliveira & Martins (2010) found that, "lack of knowledge was the main barrier to the use of e-procurement and ICT among SMEs". Vilaseca-Requena, *et al.* (2007) found that, "the CEO's knowledge of technology has a significant relationship with e-procurement adoption among SMEs", Wen & Chen (2010) also found, "a statistically significant relationship between the status of e-procurement in the SMEs and the perception of lack of knowledge as a barrier". These results support the view that having adequate education level by the owners or managers of SMEs alone is not a necessary condition for such firms to adopt e-commerce, but they must also have relevant knowledge in ICT use.

Manuel & Duarte (2015) found that, "organizational size, which is an indicator of the level of operational resources of the company, is positively and significantly related to e-procurement adoption". This is in line with earlier studies by, for example Vilaseca-Requena *et al.* (2007) on ICT skills and experience by employees, Gupta & Narain (2011) found that the higher the level of ICT skills, the higher the likelihood that a firm will adopt e-commerce. That is, previous IT experience has been seen to be a critical element impacting the achievement of e-procurement adoption.

2.7.2 Environmental Factors

Huy (2012) found a positive correlation between e-commerce adoption and the manager's view on the intensity of competition, backing of industry pressure, supplier and buyer behavior and sector of business operations. These findings conform to those of prior studies by Al-Qirim (2007) and Too and Ngai (2007) but are inconsistent with those of Joen et al. (2006) and Vilaseca-Requena et al. (2007). It has widely been argued that the industry in which the firm operates influences the adoption of information systems, including e-commerce innovations. Service industries, retail industries, and the manufacturing industry were the key sectors that demonstrated a significant relationship with innovation adoption. The authors further established that usage of information systems varies not only through sectors but also inside the constituent sub-sectors. The role of market scope as a forecaster of the adoption of e-commerce can be explained from two main perspectives. Firstly, interior coordination costs increment as firms extend their market reach because of expanded regulatory many-sided quality and data handling. Besides, outside costs would likewise increment with market scope, that is, when firms grow their market achieve, they cause look costs, which incorporate hunting down shoppers, exchanging accomplices, and wholesalers. Seemingly, firms that serve more extensive markets will probably embrace web-based business, in this manner; SMEs with more noteworthy market degree will probably receive web based business.

Vilaseca-Requena *et al.* (2007) has also recognized that there is a positive and important relationship between competitive pressure and the adoption of e-commerce. The plausible argument for this observation is that if the innovation directly affects the competition, then the adopter will have an incentive to take up the technology. According to Vilaseca-Requena *et al.* (2007), the bigger the competitive force, the more possible those SMEs will adopt e-commerce. There is also evidence that the growth of third-party information systems support has a significant influence on the likelihood of e-commerce adoption whereby the larger the outside backing, the more likely they would be adopted by SMEs, Porter (2008) suggested that the adoption of IT will change the competitive environment through changing the structure of the industry, changing the rules of competition and giving businesses new methods by which to gain competitive advantage over the competition. According to Sandy and Graham ((2007), intensity

of competition is associated with the degree of e-commerce adoption and that competitive pressure is a basic variable influencing the extent of e-commerce adoption among SMEs.

In contrast, Pan and Jang (2008) found that competition has very minute impact on the adoption of new technologies or web based business in small enterprises. But a study by Thomas and Simmons (2010) showed opposite results. A relationship likewise exists between the force of rivalry in an industry and the level of adoption of electronic business. As indicated by Kinyanjui and McCormick (2002), “guaranteeing rivalry and passage open doors for other market players, especially smaller ones”

2.7.3 Technological Factors

The choice to adopt a technology is not just subject to what is accessible in the market, but on how the new technologies counterpart with those that a firm as of now has. The key factors characterizing such technologies include attributes such as relative advantage (perceived innovation benefits and impact), compatibility (both technical and organizational), and complexity (ease of use or learning e-procurement).

Regarding relative advantage, Joen *et al.* (2006) found that the extent of perception of the characteristics of the technology as measured by time saving and effort (To and, Ngai, 2007), economic profitability, cost reduction, and production increase has a significant influence on e-procurement adoption. In contrast, Huy (2012) found that perceived relative advantage does not appear to play a vital role in influencing the adoption of e-procurement by SMEs. Compatibility has been observed to be a significant determinant of adoption since it manages perception of the significance of the innovation in performing different assignments in the blink of an eye and in future. For example, if e-procurement is perfect with the customary method for performing different exercises of business ventures, with the current qualities and attitude of the experts, and with various correspondence parts including everyday operations and their future improvement, then a higher rate of appropriation will happen. Al-Qirim (2007) also found that compatibility with a firm’s culture and values was a statistically significant determinant of e-procurement adoption, a result that is also in line with studies by To and Ngai (2007). The implication of this observation is that the management of the SMEs considers compatibility of the development as a critical pre-requisite for innovation adoption. Ratten and Ratten (2007) found an important

relationship between perceptibility and the observability of e-procurement inferring that the different helpful operations of e-procurement may impact the choice by SME's to embrace the innovation. The discoveries of this concentrate, in any case, repudiate those by past scientists, for instance, To and Ngai (2007), “that recognizability has no effect on the reception of e-procurement”.

2.8 Research Gap

The literature reviewed so far suggests that the available theories of adoption of innovation focus mainly on organizational, technological, and environmental contexts. It is also evident from the literature that, a number of studies have tried to address the causes of adoption from diverse viewpoints. Alam and Ali (2011), for example, attempted to achieve a deeper thought of the factors that influence the adoption and usage of ICT by SME's in Malaysia. They found that ICT offers many openings for SMEs to compete similarly with big businesses. In line with the studies on SME's, it is clear that the two models considered appropriate for the studies are those that integrate the TOE and TAM frameworks. Theoretically, TAM is intended to apply to a particular domain of human-computer relations. The TAM model considers two salient beliefs, namely, PU and PEU. In addition, the model indicates that both PEU and PU indirectly affect system usage (Liao, et al., 2009).

Compatibility is connected with the fit of innovation with related skills, while the capacity to attempt to watch is connected with the accessibility of chances for important encounters. These constructs relay to earlier technology experience or opportunities for experiencing the technology under consideration. Compatibility and the ability to attempt to watch can be dealt with as outer factors, which specifically influence the constructs in the innovation acknowledgment. After the underlying adoption, the impacts of these three develops could be decreased with ceaseless experience and diminished over the long run (Liao, et.al, 2009). Up to this point, various studies effectively incorporated TOE into TAM to explore clients' innovation acceptance behavior (Chang and Tung, 2008). Few studies have endeavored to inspect all TOE qualities with the combination of TAM. The current study therefore proposed an improvement of TAM by combining it with TOE characteristics and selected organizational factors and environmental constructs.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter states various stages that were followed in completing the study whereby the researcher identified the research study design, target population, sample design, data collecting instruments, data collecting procedures, data analysis, presentation and interpretation techniques.

3.2 Research Design

Research design is the plan of conditions for gathering and examination of information in a way that intends to join pertinence to the exploration reason with economy in procedure, (Kothari, 2009). The study used descriptive research design to enable the researcher to meet the research objectives. Descriptive research design was utilized on the grounds that it ensures broadness of data and precise descriptive analysis and features of the sample which can be utilized to make suggestions about the populace. Astalin (2013), “qualitative research is a systematic scientific inquiry which seeks to build a holistic, largely narrative, description to inform the researcher understands of a social or cultural phenomenon”.

Qualitative research is an approach for investigating and understanding the significance people or gatherings credit to a social or human issue, (Creswell, 2014). The process of research includes rising inquiries and methodology, information normally gathered in the member's setting, information investigation inductively working from particulars to general subjects, and the specialist making understandings of the importance of the information.

3.3 Population of the Study

The number of inhabitants in this study involved SME's within Machakos County. According to Ogula (2005), a population refers to any group of institutions, people or objects that have common characteristics. It is a whole gathering of people or components that have no less than one thing in like manner (Kombo and Tromp, 2006). The firm's managers and senior

procurement and transport managers will be major target group in this study. They were interviewed to help in achieving study questions and objectives.

3.4 Sampling Design

Sample design as a definite arrangement for acquiring a sample from a given populace. It refers to the method or the procedure the analyst would embrace in selecting things for the sample (Kothari, 2009). Sample design should set out the quantity of things to be incorporated into the specimen, that is, the size of the sample. Sample design is determined before information is gathered. A sample of 125 SME's in Machakos County were selected and primary data was collected from them using questionnaires, stratified random sampling technique was appropriate for purpose of sampling of the SME's in this study, since the sample was drawn from Machakos County.

3.5 Sample Size

Sample Size is the number of items to be selected from the universe to constitute a population (Kothari, 2009). The target population was made of 125 SME's in Machakos County. After applying the formula below the sample size of 95 SME's was arrived. The sample size was determined by the formula:

$$n = \frac{N}{1 + (N * e^2)}$$

where

n = sample size

N = population size

e = margin of error

This translated to:

$$n = \frac{125}{1 + (125 * 0.05^2)} = 95$$

3.6 Data Collection

Secondary Data and Primary data were used for this study. The data was collected using questionnaires. According to Orodho (2004), “a questionnaire is a carefully designed instrument for collecting data in accordance with the specification of research questions”. The questionnaires are preferred due to their suitability for this type of study. Mugenda and Mugenda (1999) observed that “questionnaires are commonly used to obtain important information about the population”. The questionnaire was designed address various objectives on the research.

The questionnaire used consisted of both closed and open-ended questions. The closed-ended questions provided data that is easy to compute and analyze, while the open-ended questions permit a greater depth of response, thus adding quality to the data collected. For this study, there was one type of questionnaires to be used. The secondary data was collected through published reports and other past research papers and peer review on the topic of the study.

3.7 Data Collection Process

Prior to the commencement of data collection, the researcher obtained all the necessary documents, including an introduction letter from the University. Audience with the sampled local authorities in the region was also sought to clarify the purpose of the study. Upon getting clearance, the researcher in person would distribute the questionnaires to the sampled individuals who are the managers and assistant managers of the selected. Use of questionnaires is expected to ease the process of data collection, as all the selected respondents would reach in time. During the distribution of the instruments, the purpose of the research was explained.

3.8 Pilot Testing

Three individuals from five firms were used. They were thoroughly checked by the supervisors to ascertain their accuracy. They were piloted to ensure that they meet objective of this research. The piloting helped to modify and remove any ambiguous items on the instrument. The data to be collected during the piloting was analyzed and the results used for appropriate amendment of the instruments. “The main objective of pilot testing is to ascertain the accuracy and validity of the instruments before they are used in the actual study” (Mugenda and Mugenda, 1999).

Cronbach's Alpha was applied to test reliability of instruments and internal consistence. The value ranges between 0-1 with reliability increasing with increase in value. "Coefficient of 0.6-0.7 is commonly acceptable rule of thumb that indicated acceptable reliability and 0.8 or higher indicated good reliability", (Mugenda 2008).

"Reliability is a measure of the degree to which a research instrument yields consistent results or data after a repeated administration", (Mugenda and Mugenda, 2003). According to Borg and Gall (1986), "reliability is the level of internal consistency or stability of measuring device overtime". A measuring instrument is only reliable if it provides consistent results. In a research study, reliability coefficient can be computed to indicate how reliable data is. "A coefficient of 0.70 or more implies that there is a high degree of reliability of data", (Mugenda and Mugenda, 2003) In this study, split half reliability measure was used in which the instruments was divided into two equal parts on the basis of even and odd appearances. The two parts was therefore, administered for the pretest samples and the result obtained compared using Spearman Product Moment Coefficient of Correlation (r). This would be subjected to Spearman- Brown Prophecy formula in which an alpha value of 0.81 should be obtained to indicating that research instrument is highly reliable.

3.8.1 Result of the Pilot Study

The study involved random selection of a pilot group of 3 individuals from 2 logistics firms each. The findings are recorded below

Table 1: Pilot Study Results

Variables	Cronbach's
Technological barrier	0.701
Environmental barrier	0.769
Organizational barrier	0.731

The findings of the pilot study showed that the technological barrier scale had a Cronbach's reliability of 0.701, environmental barrier had a reliability alpha value of 0.769 and lastly organizational barrier had a reliability alpha value of 0.731. Thus therefore indicated that the research tool was sufficiently reliable and valid and needed no amendment.

3.9 Data Analysis and Presentation

Quantitative data was analyzed through statistical techniques and was generated using statistical package for social sciences (SPSS) and data obtained was communicated through pie charts, tables and bar graphs. Qualitative data was analyzed descriptive statistics. Orodho (2004) defines data analysis as “a process of systematically searching and arranging interview transcript, field notes, data and other materials obtained from the field with the aim of increasing your understanding of them and enabling you to present them to others”.

Mugenda (1999) summarizes it as “the process of bringing order, structure and meaning to the mass of information collected”. Data analysis is a process that helps to arrange the collected data in a way that can be interpreted. Once questionnaires are received, the next process is to verify the data. The data was coded, tabulated and classified and finally subjected to both quantitative and qualitative analysis.

$$\text{Adoption depth (Y)} = \beta_0 + \beta_1\text{Tech} + \beta_2\text{Envir} + \beta_3\text{Org}$$

3.10 Operationalization of the Research Variables

Operationalization is the process of strictly defining variables into measurable factors. This process defines concepts and allows them to be measured empirically and qualitatively.

3.10.1 Operationalization of Variables

Variables	Indicators	Operationalized	Analysis
Technology	Availability	Number of Technical expertise Number IT infrastructure like computers Availability of E-procurement Software	Descriptive and Regression Analysis
	Characteristics	Ease of use Security threats support from developers Flexibility of use	Descriptive and Regression Analysis
Organization	Formal and informal linking structures	-Nature of Organizational structures staff retention rate Education level of managers	Descriptive and Regression Analysis
	Size	Small, Medium, Large, Capital base	Descriptive and Regression Analysis
	Slack	Employee education level Area of specialization	Descriptive and Regression Analysis
Environmental	Industry characteristics	Perception Use of e-commerce	Descriptive and Regression Analysis
	Market structure	Market scope business benefits, cost	Descriptive and Regression Analysis
	Technology support infrastructure	Use of technology, guidelines	Descriptive and Regression Analysis
	Government regulation	Number of Legal & regulatory systems Trading legislations and standards	Descriptive and Regression Analysis

3.11 Ethical Considerations

Individual consent is in the basis for one to participate in the study. No respondent was coerced into giving information. Respondents were assured that information will be treated with confidentiality in case there was need for that. Data collected was used specific for this research alone and would there not be revealed to any other party with need to carry out a similar study. For mutual trust, introduction cover letters accompanied the questionnaires for the purpose of identification of the researcher and explain purpose of the study being carried out.

CHAPTER FOUR

DATA PRESENTATION AND FINDINGS

4.1 Introduction

This chapter presents the research findings through data analysis and presentation of the research findings. The chapter begins with demographic data of the research responses, age and ownership of the companies. The chapter presents the findings in line with research objectives and research variables demonstrating the affiliation among the various variables, the data is presented in the form of tables, frequencies percentages, graphs and pie charts where possible and in line with research design and objectives.

4.1.2 Response Rate

Table 2: Response Rate

Respondents	Target	Obtained	Percentage
SME's	95	80	84.2%

Table 2 above represents the response rate where the targeted sample was 95 SME's in Machakos County. Out of the 95 SME's a total of 80 SME's responded. This represented a response rate of 84.2 %. Cooper and Schindler (2007) a questionnaire response rate of at least 75% is sufficient for a study of social nature to continue.

4.2 Demographic Results

Table 3: Demographics

Respondent Characteristics	Characteristic Details	Frequency	Percent (%)
Age	18-25	25	31.3
	26-35	41	51.3
	36-45	10	12.5
	46-55	3	3.8
	Above 55	1	1.3
Gender	Male	68	85
	Female	12	15
Education Level	Certificate	12	15.0
	Diploma	44	55.0
	Degree	22	27.5
	Masters	2	2.5
	Phd	12	15.0
Years of Service	Less than one year	0	0
	1 – 2 years	35	43.8
	3 – 5 years	24	30.0
	6 – 8 years	10	12.5
	More than 9 years	11	13.8
Duration organization has been in operation	Less than one year	0	0
	1 – 2 years	21	26.3
	3 -5 years	26	32.5
	6 – 8 years	12	15.0
	More than 9 years	21	26.3
Current number of employees in the organization	Below 20	73	91.25
	21 – 30	4	5
	31 – 40	1	1.25
	41 – 50	1	1.25
	Over 50	1	1.25

From the results shown in the above table, about the age of the respondent, the findings revealed that most of the respondents as shown by 51.3% indicated they were aged 26 to 35 years. 31.3% indicated that they were between 18 to 25 years, 12.5% of the respondent indicated that they were aged between 36 to 45 years, 3.8% of the respondent indicated that they were aged 46 to 55 years whereas 1.3% indicated that they were aged 55 years and above. Majority of respondents were male representing 85%, while only 12 of the respondents were female representing 15% of the sample. This shows that the many people working in the SME's are male implying most procurement positions are dominated by male. On the respondent level of education, the study found that majority of the respondent as shown by 55% indicated they were on Diploma level, 27.5 of the respondent indicated that they were on degree level whereas 15.0% indicated they were at certificate level while 2.5% were masters level.

From the findings on the respondent years of service, the study found that 43.8% of the respondents had served for 1 to 2 years, 30% of the respondents indicated they had served for 3 to 5 years, 13.8% of the respondents had served for more than 9 years while 12.5% of respondents indicated that they had served for 6 to 8 years. On years of operation of SME's, the study found that 32.5% of SME's had operated for 3 to 5 years, 26.3% of the respondents indicated that the SME's had been on operation for 1 to 2 years and more than 9 years respectively whereas 15.% indicated the SME's been on operation for 6 to 8 years. The number of employees in SME's, the study found that most of the respondent as 91.25% indicated they were below 20 employees, 5% of the respondents indicated that there were 21 to 30 employees while 1.25% of respondents indicated that there were 31 to 40, 41-50 and over 50 employees respectively.

4.3 Technological Barrier to E-procurement by SME's

One of the objectives of this study was to establish the technological hinderances to e-procurements by SME's in Machakos County. The results are recorded in table below

Table 4: Technological Barrier to E-procurement Adoption by SMEs

Statement	strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree	Total percentage
Inadequacy or absence of IT infrastructure	75%	15%	5%	5%	0%	100%
Insufficient assessment of systems prior to Installation	78%	5%	0%	8%	9%	100%
Lack of technical expertise and staff in competencies	52%	13%	7%	15%	13%	100%
Fear of security threats and confidentiality of information	45%	25%	4%	20%	6%	100%
Lack of a widely accepted e-procurement software solution	0%	0%	15%	35%	50%	100%
Inadequate support from system developers and vendors	4%	21%	10%	23%	42%	100%

From the findings, greater part of the respondent 75% strongly agreed that inadequacy and the IT infrastructure among the SME's discourages its e-procurement adoption, 15% of respondents agree with the same statement, while 5% were not sure and disagreed with the same statement respectively. The study further reveals that 78% of responded strongly agree that insufficient assessment of systems prior to Installation leads to collapse of e-procurement immediately after its inception in the company. Lack of technical expertise is another factor with over 52% and 23% strongly agreed and agreed respectively. Fear of security threats is also very important factor as 45% and 25% strongly agreed and agreed respectively meaning it is a barrier for e-procurement adoption by SME's.

Ratten and Ratten (2007), “found a significant relationship between perceived security threat and the adoption of e-procurement implying that the various beneficial operations of e-procurement may influence the decision by SME’s to adopt the technology”. The findings of this study, nonetheless, contradict those by previous researchers, for example, Too and Ngai (2007), “that security has no impact on the adoption of e-procurement. Confidentiality and security have been discussed broadly both in academia and practice”. Confidentiality is defined as the ability to control and manage information about oneself, while security refers to the ability to protect against potential threats. From the consumers’ standpoint, security is the ability to protect consumers’ information from information fraud and theft in the online banking business. Though most of the respondent disagreed with the fact that there is no generally accepted e-procurement by SME’s with 50% strongly disagreed with the statement and there are enough developers to deliver e-procurement software’s.

4.4 Organizational Barrier to E-procurement Adoption

This is the second objective of the study. The study sought to investigate organizational barrier that hinders adoption of e-procurement. The results are shown below.

Table 5: Organizational Barriers to E-procurement Adoption by SMEs

Statement	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree	Total percentage
Employee knowledge influence e-procurement adoption	65%	20%	10%	5%	0%	100%
Size of organization size influence e-procurement adoption	50%	30%	5%	8%	7%	100%
Poor staff retention influence rate of e-procurement adoption	45%	15%	20%	15%	5%	100%
Management knowledge of IT	55%	15%	15%	1%	14%	100%
Bureaucracy with poor organizational structures	25%	27%	40%	3%	7%	

From the study results, it is clear that employee knowledge have a greater influence of e-procurement adoption by SME's with 65% of respondent strongly agreed, 20% agree, 10% not sure with only 5% disagree. Another important factor that influences e-procurement adoption is the size of the organization with bigger organization able to adopt e-procurement faster than small organization hence organization size is a barrier. The results show that 50% and 30% of respondent strongly agree and agree respectively. Poor staffing retention is a barrier with 45% of respondent strongly agreed and 15% just agreeing. The findings of this study supports findings by Huy (2012), in a study on the significance of organizational determinants as factors of adoption also found that employees' knowledge of e-procurement, size of the enterprise, and attitudes of managers towards innovation were positive and statistically significant. Other findings also confirm the positive relationship between the attitudes of managers towards innovation and adoption of e-procurement, but the relationship is not significant regarding knowledge of the new information technologies of e-procurement.

4.5 Environmental Barrier to E-procurement Adoption Among SME's

This was the third objective of this study. The research sought to establish some of the environmental barrier to e-procurement among small and medium enterprise. The results are shown in the table below.

Table 6: Environmental Barrier to E-procurement Adoption among SME's

Statement	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree	Total percentage
Manager perception on e-procurement influences e-procurement adoption by organization	77%	13%	10%	0%	0%	100%
The market sector and scope where business operates support e-procurement/ industry pressure	80%	16%	0%	0%	4%	100%
The target audience does not	25%	15%	10%	30%	20%	100%

embrace use of technology						
E-procurement adoption has no business benefits realized	7%	5%	15%	63%	10%	100%
Acquisition and implementation cost is high	75%	17%	0%	8%	0%	100

From the result, managers perception have a strong influence in e-procurement adoption in small and medium enterprises with 77% of the respondent strongly agreeing with the statement, 13% of the respondent agreed while only 10% of respondent were not sure. The market sector where business operates also had stronger impact on the e-procurement adoption with 80% and 16% of respondent strongly agreeing and agreeing with the statement respectively. On whether the target audiences were not embracing e-procurement, it had little effect as 50% of respondent disagreed with the statement.

The findings here supports findings by Huy (2012), “found a positive correlation between e-procurement adoption and the manager’s perception of the intensity of competition, support of industry pressure, supplier and buyer behaviour, and sector of business operations”. These findings conform to those of prior studies by Al-Qirim (2007) and Too and Ngai (2007) but are inconsistent with those of Joen et al. (2006) and Vilaseca-Requena et al. (2007). It has widely been argued that the industry in which the firm operates influences the adoption of information systems, including e-procurement innovations. Service industries, retail industries, and the manufacturing industry were the key sectors that demonstrated a significant relationship with innovation adoption. The authors further established that usage of information systems varies not only across sectors but also within the constituent sub-sectors. The role of market scope as a predictor of the adoption of e-procurement can be explained from two main perspectives. Firstly, internal coordination costs increase as firms expand their market reach due to increased administrative complexity and information processing. Secondly, external costs (search costs and inventory holding costs) would also increase with market scope; that is, when firms expand their market reach, they incur search costs, which include searching for consumers, trading partners, and distributors. Arguably, firms that serve broader markets are more likely to adopt e-procurement, thus SME’s with greater market scope are more likely to adopt e-procurement.

Table 7 E-procurement Adoption by SME's

Statement	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree	Total percentage
Decrease in costs through reduced staffing levels/improved revenues	75%	15%	10%	0%	0%	100%
Quality – e-procurement has improved quality of service delivery	80%	16%	0%	0%	4%	100%
Reduction in Time through improved internal workflow/contract completion	75%	15%	10%	0%	0%	100%
Reduction in purchasing order fulfillment time - Contract Completion	7%	15%	15%	53%	10%	100%
Improved Quality through increased visibility in the supply chain	75%	17%	0%	8%	0%	100

From the results, 75% of respondent states that IT adoption reduces the cost through staff reduction, 80% agreed that e-procurement improves quality of delivery and procurement services with 75% strongly agreeing that e-procurement improves efficiency of internal services. This explains immense benefits of e-procurements to organization.

4.6 Regression

Table 8: Model Summary for all the Variables

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.828 ^a	.686	.791	.388	1.851

Table 7 above indicates that the value of the adjusted r squared R² amount to 0.791, which is 79.1%. This shows that the factors that are not covered amount only to 20.9%. It is therefore, means that the three factors have a big role to play on the e-procurement adoption among SME's within Machakos County. This study supports the findings of Livermore and Rippa (2011), "showing the factors hindering the adoption of technology among small and medium enterprises".

4.7 ANOVA

Table 9: ANOVA for all the Variables

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	35.378	3	11.793	5.304	.002
	Residual	168.984	76	2.223		
	Total	204.362	79			

The ANOVA result for all variables indicate that there was a highly large relationship between the variables at, $F = 3.04$ and $P = 0.002$. This imply that there is a strong relationship between the three variables and the adoption of e-procurement among SME's in Machakos County. In support of these findings, Livermore and Rippa (2011) investigated the relationship manager's perception and adoption of technology in organization. He found that there is strong relationship on how managers influence technological changes in organization.

4.8 Coefficient of Regression

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.573	.883		4.047	.000
TECHBAR	.828	.225	.446	3.683	.000
ORGBAR	.525	.314	.191	-1.670	.000
ENVBAR	.640	.256	.287	-2.502	.000

From the analysis, regression results shows that the three variables technological barrier, organizational barrier and environmental barrier are statistically significance with p-value of $0.00 < 0.05$. Technical barrier has greater impact on the adoption with coefficient of 0.828, organizational barrier is having 0.525 and lastly environmental barrier 0.640. This can be presented in regression equation as follows:-

$$\text{Adoption} = 3.573 + 0.828 \text{ TECHBAR} + 0.525 \text{ ORGBAR} + 0.640 \text{ ENVBAR}$$

It can be seen that a unit improvement in technological barrier improves rate of adoption by 0.828, for organization it changes by 0.525 while for environmental barrier it changes adoption rate by 0.640.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter includes the summary of finding, conclusion, recommendation and suggestion for further studies.

5.2 Summary of Findings

Objective 1: To establish how technological barriers hinder adoption of E-procurement by SME's in Machakos County

Based on the results of this research insufficient assessment of systems prior to installation was the key barrier under technological barriers to e-procurement adoption amongst SMEs. Other barriers were inadequacy or absence of IT infrastructure, lack of technical expertise and staff in competencies and fear of security threats and confidentiality of information.

Objective 2: To establish how organizational barriers hinder adoption of E-procurement by SME's in Machakos County.

From the study, employee knowledge influence e-procurement adoption was the key barrier under organizational barriers to e-procurement adoption amongst SMEs in Machakos County. Other barriers were management knowledge of IT, size of organization size influence e-procurement adoption and poor staff retention influence rate of e-procurement adoption.

Objective 3: To establish how environmental barriers hinder adoption of E-procurement by SME's in Machakos County.

The results from the study revealed that the market sector and scope where business operates was the key barrier under environmental barriers to e-procurement adoption amongst SMEs in Machakos County. Other barriers were acquisition and implementation cost is high, manager

perception on e-procurement influences e-procurement adoption by organization and the market sector and scope where business operates support e-procurement/ industry pressure.

5.3 Conclusion

5.3.1 Technical Barrier to Adoption of E-procurement Among SME's

From the outcomes, inadequacy for IT infrastructure among many SME's act as a barrier in adoption of e-procurement, security reasons lack of technical expertise are a few of the major barriers in implementing and adopting of e-procurement among SMEs in Machakos County. The study further reveals that there is sufficient software's and generally accepted software's for procurement purposes.

5.3.2 Organizational Barriers to Adoption of E-procurement by SME's

The employees technological knowhow plays significant part in ensuring quick adoption of e-procurement by SME's, large organization also are quick to adopt e-procurement compared with smaller organization with poor staff retention resulting into additional cost for hiring and training procurement officers.

5.3.3 Environmental Barriers to Adoption of E-procurement by SME's

Manager's perception and its view to general organization and other competitor's influences pace of adoption of e-procurement and technology. Sector in which organization operates, nature of business among other factors. Target audience and industry structure and competition in general influences the rate of adoption of e-procurement among SME's.

5.4 Recommendation

As shown in the results of the study, SME's should invest much in employee education standards by employing people with enough ICT skills. Employee's turnaround is very high with less than two years; SME's should motivate the e-procurement employee to avoid the high rate employee turnover. However, understaffing is also a key factor since most of the SME's have less than 20 employees. They must employ more staff to assist in operational activities of the SME's. For organizational barriers, the SME's must introduce business relationship with suppliers providing

e-procurement initiatives and come up with strategies to terminate religious objections to the internet. Technical barriers the SME's should improve on security threats and confidentiality of information and install a widely accepted e-procurement software solution.

The government has a strong role in promoting and bringing awareness on the benefits of adoption e-procurement amongst SME's. Through the established guideline the County can help in addressing the problems and challenges affecting both suppliers and business people in Machakos County. Technological barriers which from the study came out clearly as the main barriers to e-procurement adoption, the County needs to help business people in establishing good cooperation with other business partners and involving all the staff in the adoption process to avoid resistance on implementation.

Finally the SME's should formulate policies that will guide them and help in improving their operations, job security and providing flexible working environment.

5.6 Limitation of the Research

The research was limited by some SME's not accepting to fill the questionnaires due to the nature of their job.

5.7 Suggestion for Further Research

Further research need to be done to establish if there any policies followed by the SME's and since the current study was carried out in Machakos County similar studies should be carried out in other Counties to establish whether there are likenesses or contrasts on the hindrances.

REFERENCES

- Adebayo, V. O., & David Evans, R. (2015). Adoption of e-procurement systems in developing countries: A Nigerian public sector perspective. *2015 2nd International Conference on Knowledge-Based Engineering and Innovation (KBEI)*, 20–25.
<http://doi.org/10.1109/KBEI.2015.7436015>
- Afande, F. O., & Uk, F. (2015). Constraints to Small and Micro Enterprises Participation in Public Procurement in Kenya : A Case of Cleaning Services Industry in Nairobi Central Business District Central Bureau of Statistics Statistical Package for Social Scientists, *11*, 41–64.
- Altayyar, A. ATINER's Conference Paper Series CBC2014-1332.
- AL-Qirim, N. (2007). The adoption of e-commerce communications and applications technologies in small businesses in New Zealand. *Electronic Commerce Research and Applications*, 6(4), 462-473. Al-Qirim, N. A. Y. (2003). E-commerce in the aerial ma Approaches, Acts Press, Nairobi
- Alshamaila, Y., Papagiannidis, S., & Li, F. (2013). Cloud computing adoption by SMEs in the north east of England: A multi-perspective framework. *Journal of Enterprise Information Management*, 26(3), 250-275.
- Astalin, P. K. (2013). Qualitative Research Designs : A Conceptual Framework,2(1), 118–124. Creswell, J. W. (2014). *Research Design*.
- Chen and Sherrell (2000) Enticing online consumers: an extended technology acceptance perspective, *Information and Management*, 39,705-719
- Eei, K. S., Husain, W., & Mustafa, N. (2012). Survey on benefits and barriers of e-procurement: Malaysian SME's perspective. *International Journal on Advanced Science, Engineering and Information Technology*,2(6), 424-429.
- Fauziah, W., Yusoff, W., Jia, L. C., Azizan, A. Z., & Ramin, A. K. (2013). Business Strategy of Small Medium Enterprises (SMEs): A Case Study among selected Chinese SMEs in Malaysia.
- Ghobakhloo, M., Arias-Aranda, D., & Benitez-Amado, J. (2011). Adoption of e-commerce applications in SMEs. *Industrial Management & Data Systems*, 111(8), 1238-1269.

- Gupta, M., & Narain, R. (2011). A survey on adoption of e-procurement in Indian organisations. *International Journal of Indian Culture and Business Management*, 5(1), 76–109.
<http://doi.org/http://dx.doi.org/10.1504/IJICBM.2012.044019>
- Hamad, H. (2014). Antecedents of business-to-business e-commerce adoption and its effect on competitive advantage in manufacturing small and medium-sized enterprises: A comparative study of United States of America and Egypt.
- H. Zaied, A. N. (2012). Barriers to E-Commerce Adoption in Egyptian SMEs. *International Journal of Information Engineering and Electronic Business*, 4(3), 9–18.
<http://doi.org/10.5815/ijieeb.2012.03.02>
- Hassan, H. (2013). E-Procurement Use In Small And Medium Enterprises In New Zealand.
- Hirawaty, N. (2013). Application of e-Procurement Technologies for Selecting Suppliers of Agro-Based SMEs in Malaysia, 7(1), 45–66.
- Howells, J. & Tether, B. (2004). *Innovation in services: Issues at stake and trends*. A Report for DG Enterprise of the European Commission
- Huy L. V. (2012). An empirical study of determinants of e-commerce adoption in SMEs in Vietnam: an economy in transition, *Journal of Global Information Management*, 20(3) 1-35.
- Ifinedo, P. (2011). Internet/e-business technologies acceptance in Canada's SMEs: an exploratory investigation. *Internet Research*, 21(3), 255-281.
- Kimanthi, R. W. (2015). Organizational Factors Influencing Strategic Plan Development Among SMES in Machakos Town (February).
- Jeon, B. N., Han, K. S., & Lee, M. J. (2006). Determining factors for the adoption of e-business: The case of SMEs in Korea, *Applied Economics*, 38, 1905 – 1916
- Kitisha, B. (2013). Factors Influencing Growth And Development Of Small and Medium Enterprises in Kenya, A Case Study of Huruma Division, Nairobi County.
- Koech, S. K., Ayoyi, I. R., & Mugambi, F. (2016). Factors Influencing Adoption of E-Procurement in Kenya's Public Sector. *European Journal of Logistics, Purchasing and Supply Chain Management*, 4(4), pp.19-25, August 2016
- Kothari, C. R. (2009). *Research Methodology*.
- Liao, C., Palvia, P., & Chen, J. (2009). Information technology adoption behaviour life cycle: Toward a Technology Continuance Theory (TCT), *International Journal of Information*

- Management*, 29(4), 309-320.
- Livermore, R. and C. Rippa, P. (2011) “ERP Implementation: A Cross-Cultural Perspective”, *Journal of Global Information Technology Management*, 14(3), 5-26.
- Loader, K. (2013). Is public procurement a successful small business support policy ? A review of the evidence, *31(2002)*, 39–55. <http://doi.org/10.1068/c1213b>
- Low, C., Chen, Y., & Wu, M. (2011). Understanding the determinants of cloud computing adoption. *Industrial management & data systems*, 111(7), 1006-1023.
- Looi, H. C. (2005). E-commerce adoption in Brunei Darussalam: A quantitative analysis of factors influencing its adoption, *Communication of AIS*, 61-81.
- Maguire, S. C. L. K. and S. (2006). Identifying the adoption of e-business and knowledge management within SMEs. <http://doi.org/10.1108/14626000410551591>
- Manuel, B., & Duarte, A. (2015). Determinants of B2B E-purchasing adoption by SMEs By.
- Melrose, J., Perroy, R., & Careas, S. (2015). No Title No Title. *Statewide Agricultural Land Use Baseline 2015*, 1(2), 221–248. <http://doi.org/10.1017/CBO9781107415324.004>
- Moertini, V. S. (2012). Small Medium Enterprises : On Utilizing Business-to-Business e-Commerce to Go Global, *4(Icsmed)*, 13–22. [http://doi.org/10.1016/S2212-5671\(12\)00316-4](http://doi.org/10.1016/S2212-5671(12)00316-4)
- Mohlameane, M. J., & Ruxwana, N. L. (2013). The Potential of Cloud Computing as an Alternative Technology for SME’s in South Africa. *Journal of Economics, Business and Management (1: 4)*, 396-400.
- Mose, J. M., Njihia, J. M., & Magutu, P. O. (2013). E-Procurement Adoption Among Large Scale Manufacturing Firms In Nairobi , Kenya, *9(13)*, 375–401.
- Mugenda and Mugenda (2003) *Research Methods Quantitative Qualitative*
- Mugenda O.M & Mugenda A.G (1999) *Research Methods Quantitative Qualitative Approaches*, Acts Press, Nairobi
- Ngai, E.W.T. (2007). Predicting the organisational adoption of B2C e-commerce: an empirical study, *Industrial Management and Data Systems*, 106(8), 1133-1147.
- Ngugi, J. N., & Bwisa, H. (2013). Factors Influencing Growth Of Group Owned Small And Medium Enterprises: A Case Of One Village One Product Enterprises. *International Journal of Education and Research*, 1(8), 1–14. Retrieved from <http://www.ijern.com/journal/August-2013/44.pdf>

- Ogula, P. A. (2005). Self Study Material for the Bachelor of Education degree Research Methods. *Nairobi: CUEA*.
- Oliveira, T., & Martins, M. F. (2010). Information technology adoption models at firm level: review of literature. In *European Conference on Information Management and Evaluation* (p. 312). Academic Conferences International Limited.
- Ongori, H., & Migiro, S. O. (2010). Information and communication technologies adoption in SMEs: literature review. *Journal of Chinese Entrepreneurship*, 2(1), 93-104.
- Orodho, J. (2004). *Essentials of Educational and Social Sciences Research Method*. Nairobi: Masola Publishers
- Ratten, V. and Ratten, H., 2007. Social cognitive theory in technological innovations. *European Journal of Innovation Management*, 10(1), pp.90-108.
- Rauniar, R., Rawski, G., Yang, J., & Johnson, B. (2014). Technology acceptance model (TAM) and social media usage: an empirical study on Facebook. *Journal of Enterprise Information Management*, 27(1), 6-30.\
- Pan, M. J., & Jang, W. Y. (2008). Determinants of the adoption of enterprise resource planning within the technology-organization-environment framework: Taiwan's communications industry. *Journal of Computer information systems*, 48(3), 94-102.
- Philip, K., Simiyu, I., & Namusonge, P. G. S. (2016). Factors Affecting Procurement Of Goods In Government Ministries Case Of The National Treasury .
- Prodromos Chatzoglou Dimitrios Chatzoudes. (2016). Factors affecting e-business adoption in SMEs : an empirical research.
- Rotchanakitumnuai, S. (2013). The governance evidence of e-government procurement. *Transforming Government: People, Process and Policy*, 7(3), 309–321.
<http://doi.org/10.1108/TG-01-2013-0004>
- Saunders. (2009). Understanding research philosophies and approaches, 2–30.
- Shemi, A. P. (2012). *Factors affecting e-commerce adoption in small and medium enterprises: An interpretive study of Botswana* (Doctoral dissertation, University of Salford).
- Simon, M. (2013). Interdisciplinary Journal O F Contemporary Research In Business Factors Affecting Use Of E-Procurement : A Survey in selected Firms In Kisii Town , Kenya . Omany Fredrick Otieno, 589–621.
- Smith, S. (2013). Determining Sample Size: How to Ensure You Get the Correct Sample Size.

- Qualtrics*. [http://doi.org/10.1016/S0894-1130\(12\)80119-0](http://doi.org/10.1016/S0894-1130(12)80119-0)
- Stephens, J., & Valverde, R. (2013). Security of E-Procurement Transactions in Supply Chain Reengineering. *Computer and Information Science*, 6(3), 1–20.
<http://doi.org/10.5539/cis.v6n3p1>.
- Taylor, M., Murphy, A., Taylor, M., & Murphy, A. (2006). SMEs and e-business.
<http://doi.org/10.1108/14626000410551546>.
- Vilaseca-Requena, J., Torrent-Sellens, J., Messeguer-Artola, A., & Rodriguez-Ardura, I. (2007). An integrated model of the adoption and extent of e-commerce in firms. *International Advances in Economic Research*, 13, 222-241.)
- Vladimirov, Z. (2014). Factors for the e-business adoption by small tourism firms and the role of shadow economic practices, *I*, 5–34.
- Wen, K. W., & Chen, Y. (2010). E-business value creation in Small and Medium Enterprises: a US study using the TOE framework. *International Journal of Electronic Business*, 8(1), 80-100

APPENDICES

Appendix I: Guideline on Smart use of E-procurement for SMEs in the Counties

1. Introduction

E-procurement benefits have often been demonstrated over recent years - improved management and sourcing information, better compliance and user fulfillment being just very little. A few organizations have effectively implemented complete solutions however several are still at the planning and business case phase. While much has been composed about e-procurement systems, little has been said in regards to best practice to alleviate obstructions to e-procurement adoption among SMEs. This guideline brings together the experiences of many leading organizations to give that best practice direction to every one of us to take after. This guideline will help you comprehend the decision making route that you should go ahead keeping in mind the end goal to choose the most reasonable suite of e-instruments to address the issues of your business. SMEs play vital roles in supporting national financial advancement, such vital roles of SMEs can be observed in a number of aspects including labor absorption, income generation and distribution, poverty alleviation, training and redesigning enterprise abilities.

2. Objective

a) To improve service levels to buyers and sellers involved in SMEs

While the acknowledgment of cost efficiency is a key target of the e-procurement activity, cost is the just a single measurement against which procurement execution ought to be measured. It is additionally expected that the introduction of e-procurement and the related procurement process related changes will add to enhanced service levels for all parties, purchasers, dealers and clients.

b) To develop a more integrated approach to procurement among SMEs

The organizational structures recommend co-operation among SMEs to encourage e-procurement adoption

c) To minimize the operation cost associated with procurement and standardization, streaming and automation of the procurement processes within and where appropriate across SMEs

E-procurement through the arrangement of automated support for the transaction related components of the procurement process acknowledge proficiency increases through a lessening in exchange cost connected with acquisition.

f) To advance competition among providers while keeping up dependable wellsprings of supply.

This goal concentrates on two components – fulfillment in the supply base and unwavering quality of supply. E-obtainment has a part to play in both.

g) To be dynamic in the appropriation of obtainment related Information and Communication Technologies (ICT)

It is critical that Counties be at the cutting edge being used of ICT particularly SMEs, to embrace present day acquisition innovation furthermore to guarantee the general aggressiveness or economy through reduction in expenses of executing business among SMEs

h) To advance utilization of e-procurement in more extensive economy

It is essential that e-procurement adds to the general aggressiveness of the Kenyan economy affecting the level of e-procurement adoption.

3. Target Audience

This guideline is particularly to all entrepreneurs, workers in SMEs and Counties to empower SMEs to defeat the boundaries to e-procurement adoption.

4. Uses of E-Procurement among SMEs

E-tendering, e-auctioning, vendor management, catalogue management, order status, contract management, e-invoicing, purchase order integration, e-informing,

5. Barriers to E-Procurement among SMEs

Barriers	Description
Technology	Absence of support from system developer and sellers pose a hindrance to e-procurement systems take-up by SMEs.
Infrastructure and Legislation	Inadequacies in government policies and legislation can influence take-up of ICT system.
Environment	There are conditions where organizations decide not to utilize e-procurement systems to keep up trust and close relationship with their providers and clients.
Resource Constraints	The cost of taking up e-procurement displays a big risk to SME proprietor. The proprietor or workers has no specialized ability on e-procurement systems.
Organizational and Management Characteristics	Business type, large firm size as far as money related limit and number of workers per physical foundation influence adoption by SMEs.
Client/Supplier Readiness	Fear of investing in solutions that trading partners aren't ready or willing to adopt.
Finances	Insufficient financial support especially for small companies and Implementation cost issues.

Others

- Change management issues
- Security issues
- Not in the priority of the organisation
- Lack of planning
- Lack of awareness and understanding of e-procurement and its benefits from a strategic and organizational perspective

6. Expected Benefits of using E-Procurement Among SMEs

Benefit	Description
Control	There is real time reporting by systems enabling management to have speedy and dependable way to balance the expenditure with budget, allowing fast response to problems.
Transparency	Transparency of agreement details, for example, contractual conditions, time and terms of requests making it obvious to relevant parties inside and remotely.
Decentralization	Centralized tracking will enable transactions and full reporting on requisitions, items bought, orders process and payments made.
Cost savings	It allows savings on order cost, managerial costs, and lead-time order cost
Time savings	It saves time spend in procurement process making the cycles shorter.
Productivity	Internal clients can acquire the things they need from a list of affirmed things through an online requisition system.

Others

- Free access to suppliers and contractors
- Greater accountability
- Improved management reporting, monitoring and audit
- Automatic collection of market data

7. Applicable Laws

- IT security policy
- E-payments/receipts policy
- Application usage
- Electronic contract development
- SME engagement and facilitation
- Business continuity planning
- Mobile technology options
- User roles and responsibilities

8. Funding Sources

- From savings
- Funding should be allocated annually to Counties to support e-procurement adoption amongst SMEs thereby giving soft loans to sellers.

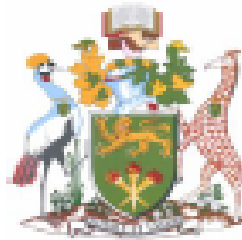
9. Role of County Governments

- Ensuring accountability and transparency to all SMEs in formulation of policies
- Ensure that procurement acts, rules and regulations are followed
- Strengthen governance, efficiency and economic development

10. Way Forward

- To establish a more detailed guideline on how to mitigate any barriers to e-procurement adoption.
- To establish an appropriate organization structures with the fundamental assets and abilities to drive e-procurement adoption.
- To introduce effective and innovative e-procurement practices

Appendix II: Introductory Letter



**UNIVERSITY OF NAIROBI
COLLEGE OF BIOLOGICAL AND PHYSICAL SCIENCES
SCHOOL OF COMPUTING AND INFORMATICS**

Telephone: 4447870/44444919/4446544
Telefax: 4447870
Email: mturi@uonbi.ac.ke

P. O. Box 30197
00100, GPO, Nairobi
Kenya
16 July 2016

TO WHOM IT MAY CONCERN

ANGELINE MUKULU NGUI (P54/79035/2015)

The above named is a student in the MSc in Information Technology Management of the University of Nairobi. As part of the requirements of the programme the student is required to undertake a research project and write a report. Her project is entitled: Adoption of E-Procurement in Small and Medium Enterprises in Kenya: A Case Study of Machakos County.

The objective of the study is to assess the barriers to e-procurement adoption amongst SMES in Kenya.

I am therefore requesting that you assist the student obtain required information for the study. Your assistance will be highly appreciated

Yours faithfully,

A handwritten signature in black ink, appearing to read 'Christopher A. Moturi'.

**CHRISTOPHER A. MOTURI
DEPUTY DIRECTOR
SCHOOL OF COMPUTING AND INFORMATICS**

Appendix III: Questionnaire

Dear Sir/Madam,

Dear respondent, I'm conducting a research study on the barrier to e-procurement adoption among SME's in Machakos County. The questionnaire items are about the study and you are kindly requested to participate in responding to the questions below. The information given will be treated as confidential and the results of the study will be used for academic research purposes only.

Part A: Bio Data

Please answer these questions to the best of your knowledge. Write your response in the space provided. Please put a tick where appropriate

Respondent Characteristics	Characteristic Details	Frequency
Age	18-25	
	26-35	
	36-45	
	46-55	
	Above 55	
Gender	Male	
	Female	
Education Level	Certificate	
	Diploma	
	Degree	
	Masters	
	PhD.	
Years of Service	Less than one year	
	1 – 2 years	
	3 – 5 years	
	6 – 8 years	
	More than 9 years	
Duration organization has been in operation	Less than one year	
	1 – 2 years	
	3 -5 years	
	6 – 8 years	
	More than 9 years	
Current number of employees in the organization	Below 20	
	21 – 30	
	31 – 40	
	41 – 50	
	Over 50	

SECTION I: BARRIERS TO E-PROCUREMENT ADOPTION BY SMALL AND MEDIUM ENTERPRISES MACHAKOS COUNTY

SECTION A: Technological Barriers

- a) By ticking at the appropriate box, what is your level of agreement with the following statements if they are barriers to e-procurement adoption amongst SMEs? Use the rating criteria given:- **1 = Strongly Agree, 2 = Agree, 3 = Not Sure, 4 = Disagree, 5 = Strongly Disagree**

Statement	1	2	3	4	5
Inadequacy or absence of IT infrastructure					
Insufficient assessment of systems prior to Installation					
Lack of technical expertise and staff in competencies					
Fear of security threats and confidentiality of information					
Lack of a widely accepted e-procurement software solution					
Inadequate support from system developers and vendors					
The IT usage is flexible in the organization					

- (b) In your own view, list any other technical barriers that have affected e-procurement adoption by SMEs?

.....

.....

SECTION B: Organizational Barrier

a) By ticking at the appropriate box, what is your level of agreement with the following statements if they are barriers to e-procurement adoption amongst SMEs? Use the rating criteria given:- **1 = Strongly Agree, 2 = Agree, 3 = Not Sure, 4 = Disagree, 5 = Strongly Disagree**

Statement	1	2	3	4	5
Employee knowledge influence e-procurement adoption					
Size of organization size influence e-procurement adoption					
Poor staff retention					
Management knowledge of IT					
Bureaucracy with poor organizational structures					
Resistance to uptake of IT support initiatives					
Lack of business relationship with suppliers providing e-procurement initiatives					
Organizational/business culture do not promote adoption of e-procurement					
Literacy levels and language difficulties					
Mistrust of technology reliance in business operations					
Religious objections to the internet					
Manager perception on e-procurement influences e-procurement adoption by organization					

(a) What is the size of your organization?

- (a) Small [] (b) Medium [] (c) Large []

(b) What is your capital base?

(a) 500,000 -1,000,000 [] (b) 1,000,001 – 5, 000,000 [] (c) Over 5 million []

(c) In your own view, which other social-cultural barriers has affected e-procurement adoption by SMEs?

.....

SECTION C: ENVIRONMENTAL BARRIERS

a) By ticking at the appropriate box, what is your level of agreement with the following statements if they are barriers to e-procurement adoption amongst SMEs? Use the rating criteria given:- **1 = Strongly Agree, 2 = Agree, 3 = Not Sure, 4 = Disagree, 5 = Strongly Disagree**

Statement	1	2	3	4	5
The market sector and scope where business operates support e-procurement/ industry pressure					
The target audience does not embrace use of technology					
E-procurement adoption has no business benefits realized					
Acquisition and implementation cost is high					
Absence of legal regulatory systems					
No simple procedures and guidelines					
Lack of e-procurement standards					
Lack of e-trading legislations					

(a) In your own view, which other environmental barriers has affected e-procurement adoption by SME's?

.....

.....

SECTION D – E-PROCUREMENT ADOPTION BY SME’S

a) By ticking at the appropriate box, what is your level of agreement with the following statements about e-procurement adoption amongst SMEs? Use the rating criteria given:-

1 = Strongly Agree, 2 = Agree, 3 = Not Sure, 4 = Disagree, 5 = Strongly Disagree

Statements	1	2	3	4	5
Decrease in costs through reduced staffing levels/improved revenues					
Quality – e-procurement has improved quality of service delivery					
Reduction in Time through improved internal workflow/contract completion					
Reduction in purchasing order fulfillment time - Contract Completion					
Improved Quality through increased visibility in the supply chain					
Improved Quality through increased procurement efficiency					
Improved Quality through Improved Communication					

.....

.....

End

Thank you for taking time to complete the questionnaire.