

e-COMMERCE ADOPTION BY SMALL AND
MEDIUM ENTERPRISES (SMEs)
A CASE STUDY OF SELECTED FIRMS IN KENYA

BY

Reuben Wanjala Wanyonyi

P56/70531/2007

Supervisor

Dr. Elijah Omwenga

A PROJECT PRESENTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF
THE DEGREE OF THE MASTER OF SCIENCE (INFORMATIONS SYSTEMS) -
UNIVERSITY OF NAIROBI

2010

University of NAIROBI Library



0439168 6

Declaration

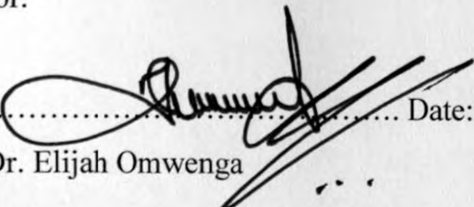
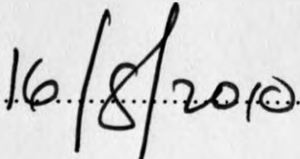
I, the undersigned, declare that this project is my original work and has not been submitted to any other college, institution or university other than the University of Nairobi for academic credit.

Signed:  Date: 

Reuben Wanjala

P56/70531/2007

This project has been presented for examination with my approval as the appointed supervisor.

Signed:  Date: 

Dr. Elijah Omwenga

Dedication

This project is dedicated to my wife Emily, my two daughters Angel and Alva for their unwavering support, encouragement, sacrifice and patience.

I truly cherish all of you.

May the Almighty Gob bless you today and forever more.

Abstract

According to the study conducted by the International Finance Corporation (IFC) in 2004, Small and Medium Enterprises (SMEs) play a very important role in society; they provide employment to over 3.2 million people and account for 18% of Kenya's Gross Domestic Product. With the upsurge of internet and e-commerce these SMEs have the potential of contributing more to the economic growth of this country but only if they embrace this technology. To create a conducive environment for the growth of e-commerce the government has implemented various initiatives like improving infrastructure and legislation. Indeed, the challenge for SMEs is to take advantage of these initiatives and tap into e-commerce for their continued growth.

The purpose of this study was to gain an appreciation of the extent to which SMEs have adopted e-commerce with respect to using e-tools as information systems. Additionally, the study looked at the factors that inhibit and/or facilitate e-commerce adoption as guided by the Unified Theory of Acceptance and Use of Technology (UTAUT) model developed by Venkatesh *et al.*

Using questionnaires, the study collected data from various SMEs across four major towns in the country. Findings confirmed an impressive use of e-commerce with mobile phones and computers being the main tools. Having been influenced by factors like peer organizations, ease of use and performance expectation SMEs are using these tools to conduct market research, learn, access business information as well as pay business bills and other obligations.

Obstacles that hinder firms from using e-commerce range from the fact that internet is expensive, inadequate or poor infrastructure, cyber insecurity and lack of adequate legal environment. Among recommendations put forward to the government to address these obstacles include speedy formulation and implementation of measures that will lower internet bandwidth especially after commissioning of several undersea fibre cables, enhanced infrastructure as well as firming up the legal institutions.

In conclusion, Kenya, as a country stands to gain a lot from the use of e-tools as information systems in doing business. With small enterprises showing an impressive adoption of e-commerce, the entire society needs to embrace this technology specially in this information age.

Abbreviations

B2B	Business-to-Business
B2C	Business-to-Consumer
C2C	Consumer -to-Consumer
CCK	Communications Commission of Kenya
EDI	Electronic Data Interchange
GSM	Global System For Mobile Communications
GSMA	GSM Association
ICT	Information Communication and Technology
IFC	International Finance Corporation
IGO	Inter-Governmental Organization
IP	Internet Protocol
ISP	Internet Service Provider
ITU	International Telecommunication Union
GDP	Gross Domestic Product
Kbps	Kilobits Per Second
KP&TC	Kenya Posts and Telecommunications Corporation
LAN	Local Area Network
LDC	Least Developed Country
Mbps	Megabits Per Second
MCS	Mobile Communication System
MDGs	Millennium Development Goals
MMS	Multimedia Messaging Service
NGO	Non-Governmental Organization
PC	Personal Computer
PSTN	Public Switched Telephone Network
PTT	Push To Talk
SIM	Subscriber Identity Module
SMEs	Small and Medium-sized Enterprises
SMS	Short Message Service
TCP	Transport Control Protocol
UNCTAD	United Nations Conference on Trade and Development
WSIS	World Summit on the Information Society
M-Pesa	Mobile money service offered by Safaricom, one of the mobile service providers in Kenya
Zap	Mobile money service offered by Zain, one of the mobile service providers in Kenya

List of figures

FIGURE 1: CATEGORIES OF E-COMMERCE.....	14
FIGURE 2 : WORLD INTERNET GROWTH 1995 - 2010	21
FIGURE 3: INTERNET USAGE STATISTICS.....	25
FIGURE 4: INTERNET PENETRATION.....	25
FIGURE 5 : UTUAT MODEL	29
FIGURE 6: CONCEPTUAL FRAMEWORK	31
FIGURE 7: SECTOR MIX.....	36
FIGURE 8: LOCATION OF RESPONDENTS	37
FIGURE 9: GENDER MIX.....	38
FIGURE 10: NUMBER OF EMPLOYEES.....	39
FIGURE 11: AGE OF MANAGEMENT.....	39
FIGURE 12: OWNERSHIP OF ICT TOOLS	42
FIGURE 13: USE OF E-SERVICES	43
FIGURE 14: BENEFITS OF E-COMMERCE.....	44
FIGURE 15: DETERMINANTS OF E-COMMERCE ADOPTION	45
FIGURE 16: BARRIERS TO E-COMMERCE	46

List of tables

TABLE 1: WORLDWIDE E-COMMERCE GROWTH.....	22
TABLE 2 : INTERNET TRENDS FROM 2000 TO 2007	23
TABLE 3: INTERNET USAGE AND POPULATION GROWTH	24
TABLE 4: GENDER VS ADOPTION	38
TABLE 5 : AGE OF MANAGEMENT VS E-COMMERCE ADOPTION	40
TABLE 6 : AGE OF ORGANIZATION VS E-COMMERCE ADOPTION	40
TABLE 7: CORRELATION BETWEEN SIZE OF ORGANIZATION AND ADOPTION	40
TABLE 8: USE OF ICT TOOLS	41
TABLE 9: INTERNET SERVICE	42
TABLE 10: INTERNET BUDGETARY ALLOCATION	43
TABLE 11: APPROPRIATENESS OF USE OF ICT TOOLS	44
TABLE 12: PERCEPTION ON E-COMMERCE TOOLS.....	46

Table of Contents

<i>Declaration</i>	<i>i</i>
<i>Dedication</i>	<i>ii</i>
<i>Abstract</i>	<i>iii</i>
<i>Abbreviations</i>	<i>iv</i>
<i>List of figures</i>	<i>v</i>
<i>List of tables</i>	<i>v</i>
CHAPTER ONE	1
1.0 INTRODUCTION	1
1.1 DEFINITIONS AND CONCEPTS	1
1.2 BACKGROUND TO THE STUDY	2
1.2.1 <i>E-commerce in the society</i>	4
1.3 GENERAL STATEMENT OF THE PROBLEM	6
1.4 GENERAL SCOPE AND APPLICATION OF STUDY	7
1.5 SIGNIFICANCE OF THE STUDY	8
1.6 PROBLEM FORMULATION AND SOLUTION TO PROBLEM	9
1.6.1 <i>Problem Statement</i>	9
1.6.2 <i>Purpose Statement</i>	9
1.6.3 <i>Objectives of the study</i>	9
CHAPTER TWO	10
2.0 LITERATURE REVIEW	10
2.1 INTRODUCTION	10
2.2 SME SECTOR IN KENYA	12
2.2.1 <i>Challenges faced by SMEs</i>	12
2.2.2 <i>Role of SMEs in Development</i>	13
2.3 E-COMMERCE	13
2.3.1 <i>Definition and scope of e-commerce</i>	13
2.3.2 <i>Categories of e-commerce</i>	14
2.3.3 <i>Advantages and Disadvantages of e-Commerce</i>	15
2.3.4 <i>Potential of e-Commerce for SMEs</i>	17
2.3.5 <i>Challenges with e-Commerce</i>	18
2.3.6 <i>Selected example of e-commerce in use</i>	19
2.3.7 <i>What steps has Kenya taken in e-commerce</i>	19

2.3.8	<i>Worldwide e-Commerce Growth</i>	21
2.4	INTERNET AS A KEY DRIVER OF E-COMMERCE	22
2.4.1	<i>Background on Internet situation in Kenya</i>	22
2.4.2	<i>Key Internet trends from 2000 to 2007</i>	23
2.4.3	<i>Internet Usage and Population Growth</i>	24
2.4.4	<i>Internet usage statistics</i>	24
2.4.5	<i>Internet Penetration</i>	25
2.5	MOBILE PHONES AS A TOOL OF E-COMMERCE.....	26
2.6	CONCLUSION FROM THE LITERATURE REVIEW.....	27
CHAPTER THREE.....		28
3.0	THEORETICAL FRAMEWORK TO THE STUDY	28
3.1	INTRODUCTION	28
3.2	MODEL BACKGROUND.....	28
3.3	JUSTIFICATION FOR USING THE UTUAT MODEL	29
3.4	CONCEPTUAL FRAMEWORK.....	30
3.4.1	<i>Organizational factors</i>	30
3.4.2	<i>Technological factors</i>	31
3.4.3	<i>Environmental factors</i>	32
CHAPTER FOUR.....		33
4.0	RESEARCH METHODOLOGY.....	33
4.1	INTRODUCTION	33
4.2	RESEARCH DESIGN.....	33
4.3	POPULATION AND SCOPE.....	33
4.3	DATA COLLECTION.....	34
4.3.1	<i>Justification for the instrument</i>	34
4.4	DATA ANALYSIS.....	35
CHAPTER FIVE.....		36
FINDINGS AND DATA ANALYSIS.....		36
5.1	INTRODUCTION	36
5.2	SME DEMOGRAPHIC INFORMATION	36
5.2.1	<i>Response Rate</i>	36
5.2.2	<i>Sector Mix</i>	36
5.2.3	<i>Location</i>	37

5.2.4	<i>Gender of the management</i>	37
5.2.5	<i>Number of employees</i>	38
5.2.6	<i>Age of management</i>	39
5.2.7	<i>Age of the organization</i>	40
5.2.8	<i>Size of organization</i>	40
5.3	EXTENT OF USAGE OF ICT TOOLS BY SMES	40
5.3.1	<i>Internet service</i>	42
5.3.2	<i>Internet budgetary allocation</i>	42
5.3.3	<i>Use of various e-services</i>	43
5.3.4	<i>Benefits accrued by use of e-commerce</i>	44
5.4	DETERMINANTS OF E-COMMERCE ADOPTION	44
5.5	HINDERING FACTORS	46
5.6	PERCEPTION OF E-COMMERCE BY SMES	46
CHAPTER SIX		47
SUMMARY AND CONCLUSION		47
6.1	INTRODUCTION	47
6.2	DISCUSSIONS	47
	<i>Objective 1: Extent of e-commerce adoption by SMEs</i>	47
	<i>Objective 2: Determinants of technology adoption</i>	48
	<i>Objective 3: Barriers to e-commerce adoption</i>	49
6.3	RECOMMENDATION	50
6.4	<i>Conclusion</i>	51
6.5	LIMITATIONS OF STUDY	51
6.6	AREAS FOR FURTHER RESEARCH	51
APPENDIX		54
I	QUESTIONNAIRE	54
II	SELECTED SME	58
III	SUMMARY OF DESCRIPTIVE STATISTICS	59
IV	CORRELATION BETWEEN DIFFERENT VARIABLES	59
V	LETTER OF INTRODUCTION	60

CHAPTER ONE

1.0 INTRODUCTION

1.1 Definitions and concepts

Small and Medium Enterprises (SMEs)

According to the National Micro and Small Enterprise Baseline Survey of 1999, the definition of SME is based on three criteria with the first one defining SME in terms of employment. It defines micro enterprises as those employing up to 10 workers (including the working owner) small enterprises as those having between 10 and 50 workers and medium-sized enterprises as those employing 50-100 workers. On the other hand, the World Bank describes an SME as a formally registered businesses, with 5 - 100 employees and with an annual turnover of between KSh 6 million and KSh 100 million. Other researchers (Mead and Morrison, 1996) and policy makers (Visser, 1997) have also attempted to define SMEs using different criteria. Morrison (1985) and Bigsten et al (1999)'s definition based on the number of employees confer with the Baseline's definition. They however have another definition based on the degree of legality. According to this criteria SMEs are those enterprises that are not registered and do not comply with legal obligations concerning safety, taxes, and labour laws. The other definition is based on their limited amount of capital and skills per worker. The degree of informality and the size of employment have been perhaps the most readily accepted criteria on which classification of SMEs is based (Morrison, 1985 and Bigsten et al,1999).

For simplicity sake therefore, this study will use the term SME to mean enterprises employing 1-100 workers and/or with annual turnover not exceeding KSh 100 million.

Electronic commerce

Electronic commerce, commonly known as e-commerce or eCommerce, is a term used to describe all commercial and related activities facilitated through the use of information technology and network technologies such as internet, extranet and intranets (Litondo, 2007). Rayport and Jowski (2003) defines electronic commerce as technology mediated exchange of goods, services, and information that takes place between parties by means of the internet. Electronic commerce is generally considered to be the sales aspect of e-business. It also consists of the exchange of data to facilitate the financing and payment aspects of the business transactions (Litondo, 2007).

Information Communication Technologies (ICTs)

E-commerce is one of the applications of Information Communication Technologies (Litondo, 2007). According to Kashorda and Wagacha (2007), ICTs is the convergence of computing (software and hardware), telecommunication (mobile phones, fixed line, internet), and broadcasting. This convergence is certainly with us in Kenya. Mobile phone is the most popular ICT used among small businesses (Economic Forum, 2005). A significant number of SMEs in Kenya are however ignorant of ICTs and are unaware of their importance in conducting business, even in this era of globalization (Mitullah and Odek, 2002).

E-commerce adoption

E-readiness is the degree to which a community is prepared to participate in the networked world (Kashorda and Wagacha, 2007). From a social science point of view Rogers (1983) defines adoption as the decision by an organization to commit resources to an innovation. While describing the technology adoption lifecycle, Rogers states that the model describes the adoption or acceptance of a new product or innovation. In this context therefore the terms adoption and acceptance are used to mean the same thing.

Based on this definition, this study defines e-commerce adoption as the decision by an organization to commit resources to use or accept e-commerce.

1.2 Background to the study

Never before has the ability to communicate been essential to humanity. More and more people are accessing the Internet and making phone calls cheaply while the technologies keep improving. The outcome of this has been transformation of societies, economies, cultures and even politics all over the world. Information Communication Technologies, (ICTs) are changing the world in a manner never experienced since the industrial revolution. If Information Technology is defining winners and losers in the new knowledge-based economy, can we afford to ignore it? The phenomenal growth of mobile phones in Kenya and many other developing countries thought to be too poor to afford the technology is a proof that people believe it is crucial to their well being. The economic benefits are apparent. In business, for example, those who have better communications channels can access wider markets, faster and cheaply. They have an edge over the traditionalists, business as usual lot. Spontaneous growth in a typical developing country, studies have shown that "an extra 10 phones per 100 people increases GDP growth rate by 0.6 per cent points" (The Economist March 12, 2005). With the spontaneous growth of mobile phones in Kenya, now estimated at

twenty million subscribers, every other coin transacted in the informal sector businesses like at Gikomba market and at the weekly Maasai market in Nairobi is made possible with the help of a cell phone. The short message service (sms), is enabling many in the rural areas to do business at lower costs. They can make critical business decisions for as little as Sh 2. Imagine the potential the Internet would unleash among the curios and artefacts traders. With some training, access and laws in place, all they need is some web presence to stay in business 24/7 and across borders.

Imagine further that you are a tourist and have just bought something really nice from these innovative Kenyans on a Saturday morning. Come Sunday, your spouse insists s/he must have another giraffe carving for her/his good friend in Frankfurt. How will you find the trader who did not even give you a business card? But with online trading or e-commerce in place, a deal could even be sealed in the middle of a flight. Yet some would like to argue that the poor do not need such technology. The fact that they can hardly afford is not the same thing as not wanting it. Using the example of Indian farming villages connected to the Internet, e-choupal, academician and author C.K. Prahalad illustrates how the Indian dotcom farmers now look for better prices beyond the local market.

Embracing technology is not a matter of choice. If anything, we should be thinking of building ICT infrastructure with the same enthusiasm as building roads and airports. During one of the Jamhuri day speech, President Kibaki underscored the importance of ICTs in Kenya's economic growth by saying "Economic growth is today driven by the knowledge and service-based sectors, where ease of information transaction is key determinant of success".

This kind of high level political commitment is needed to spur the use of technology, especially within the government itself.

ICTs therefore have potential to give a chance to everybody to participate in the global economy. China, whose economic growth is overheating, owes a lot of her success to the use of communication technologies. So far China has overtaken Mexico as the leading exporter to the US, yet Mexico is America's next door neighbour.

1.2.1 E-commerce in the society

Adopting and improving electronic commerce practice, broadly defined, is becoming a fundamental necessity for many firms in today's society. Business and indeed every person must embrace ICT in order to improve productivity, remain competitive and fully participate in day-to-day activities. There are a number of activities that target poverty alleviation which may greatly profit from improving ICT infrastructure and Internet access. Health and medical services are the best example. Online availability of education and training are another promising area. Extension services and meteorological information for farmers can also profit from ICT. Finally, many surveys show that, even among the poorest rural populations, improved communication, often expressed as the need to stay in touch with family members working in cities, often ranks second place after improving clean water supplies.

ICT and Agriculture

E-Agriculture is one of the action lines identified in the declaration and plan of action of the World Summit on the Information Society (WSIS). The "Tunis Agenda for the Information Society," published on 18 November 2005, emphasizes the leading facilitating roles that UN agencies need to play in the implementation of the Geneva Plan of Action. The Food and Agriculture Organization of the United Nations (FAO) has been assigned the responsibility of organizing activities related to the action line under C.7 ICT Applications on E-Agriculture.

In their e-book, EHUD and Offer (2006) report that in the United Kingdom (UK), for example, growth of computer use in agriculture has come through increasing statutory requirements for data, especially related to tracking, mapping, and quality assurance, such as the demand on the part of buyers for information on the provenance of food. Use of email is increasing the presence of ICT in agriculture, as well as use of information updating services like price and market reports and weather reports. There is undoubtedly a place for e-trading in agriculture, its fragmented structure, relatively dispersed trading community and consequently inefficient supply chains mean that there is ample scope to reduce costs and improve service levels. The increasing acceptance of the internet as a business tool by the rural community and by the supply trade will also drive progress in this direction."

EHUD (2006) also discusses the potential of Geographic Information Systems (GIS) mapping to support a method called Precision Farming, which uses mapping to identify types and levels of application of fertilisers or spray regimens for optimal crop yields.

ICT and access to information

Access to accurate and timely information by rural folk can result in enhanced economic and social development. For example Women of Uganda Network (WOUGNET) a non-governmental organisation was initiated to develop the use of information and communication technologies (ICTs) among women as tools to share information and address issues collectively. According to findings from the 2003 WOUGNET Evaluation Report, WOUGNET activities had increased awareness and participation of women in ICT related activities, as well as increased information sharing and networking among women and women organisations. However, the benefits were still limited to those organisations that had access to Internet, leaving out the majority of women and women organisations in the rural areas.

As expected, the private sector in Kenya been on the forefront in availing information to the public via ICTs; for instance most media houses (KTN, KBC, NTV etc) have short codes sms service through which they make news available to subscribers. Additionally, KTN recently entered a business partnership with DSTv to avail TV service to Safaricom subscribers free, at least for the first 12 months.

The government has embraced use of ICT to enhance both government efficiency, transparency, accountability and service delivery, and citizen participation and engagement in the various democratic and governance processes. All ministries and other government agencies are increasingly making information available to the public through websites. The Ministry of Immigration for example has gone a step further to avail information regarding national identification cards and passports through short messaging service (sms).

ICT and access to financial services

Since M-Pesa was launched in Kenya a few years ago, Safaricom has had a sharp increase of subscribers who wanted to make use of the service. This confirms the eagerness and willingness of the Kenyan population to embrace mobile banking. Since then, most of the commercial banks have moved in to avail banking services on their clients' mobile phones. Using M-Pesa or Zap a trader at the Kibuye or Gikomba market, using her cellphone, will easily and conveniently pay her supplier of sukuma wiki from the comfort of her stall, saving on the time, cost and hassle of travelling.

ICT and Environmental sustainability

In his paper entitled "ICT and Ensuring Environmental Sustainability" John Daly (2003) explores how recent "revolutionary" changes in information and communication technologies (ICT) affect environmental sustainability, with an eye to the Millennium Development Goal (MDG) set up to ensure environmental sustainability in this century. He argues that ICTs make it possible for the first time in history to detect environmental problems at very large and very small scales. They permit unprecedented monitoring of environmental quality, and unprecedented accuracy in detection of the sources and projection of the development of environmental problems.

ICTs can be used to empower people with unprecedented understanding of environmental systems, and of the interplay between environment and development. Almost any intervention that can be identified to improve sustainability or reclaim degraded environmental systems can benefit from appropriate applications of ICT. Through TV, newspapers and FM radio, Kenyans are being informed about the effect of encroaching on the forests at the water catchment areas like Mau Forest.

ICTs can therefore be used to allow unprecedented intensity of communication on such issues among all sectors of society

E-Commerce and Healthcare

In his paper, Jacobson (2009) explores how e-commerce can lower the cost of health care thereby decreasing financial barriers to accessing health care services. He provides a snapshot of healthcare Internet e-commerce by consideration of the economic principles behind e-commerce and positive applications of e-commerce to financial transaction processing, customer service, and health services delivery.

1.3 General statement of the problem

Globally, SMEs are widely regarded as the engines of growth and seed-bed for industrialization. This is premised on the fact that SMEs provide one of the most prolific sources of employment, not to mention the breeding ground for medium and large industries, which are critical for industrialisation. For instance, the Kenya SME Country Study commissioned by the International Finance Corporation (IFC), reported that there are an estimated 22,000 SMEs in the country employing over 3.2 million people. Representing 66% of all formally registered private enterprises, the SMEs accounted for 18% of the GDP.

Additionally, in its pledge to create 500,000 jobs annually, the Government of Kenya reiterates that the bulk these jobs will come from the SME sector. This underscores the importance of SMEs in the society and the economy.

On its part as a facilitator and provider of an enabling environment, the government has so far mooted several initiatives to spearhead adoption and use of e-commerce. These initiatives include zero-rating of ICT equipment, setting an e-government department, passing of the Communication Act 2008, establishing digital villages across the country and laying of the under-sea fibre cable to connect the country onto the global superhighway among others.

Looking at the current trend of technological advancement, these initiatives are informed by the fact that adopting ICT and electronic commerce, is becoming a fundamental necessity for many firms. Businesses, and in particular SMEs, must embrace ICT in order to improve productivity and remain competitive. While nobody can say for sure how much e-commerce can speed up economic development, not embracing it would almost certainly slow it down.

Having looked at the pivotal role that SMEs play in our country vis-à-vis the government's efforts to promote adoption of e-commerce the question that this study wishes to answer is to what level have these SMEs adopted e-commerce? It is possible that the SMEs are oblivious of the importance of e-commerce and are likely to be left behind or that they have embraced the idea and are reaping the fruits?

1.4 General scope and application of study

The study used parameters/definition of an SME as a formally registered business, with 1 - 100 employees and with an annual turnover not exceeding Sh. 100 million. The study was limited to a few selected enterprises located in Nairobi, Mombasa and Eldoret where the Export Promotion Council, our employer, has offices.

The results of the research shall be used by the academia to appreciate the effect of e-commerce in various spheres that relate to society like education, poverty, access to information. Our employer will also use the information to gain an understanding of the extend to which e-commerce has been adopted and hence devise ways to assist these SMEs use e-commerce to do international business. The study will also help the government to appreciate the existing gaps in e-commerce and in turn help in formulating any efforts that can help SMEs grow.

1.5 Significance of the study

The aim of this study was to establish the extent to which Small and Medium Enterprises had adopted electronic commerce. The analysis of the study was expected to benefit researchers, the government and business people in different ways as outlined below:

The academia

In academic cycles, the study would assist in appreciation of how SMEs are using ICTs as information systems to improve the well-being of the entire society. In contributing to the existing body of knowledge, the study would assist in giving an indicative impression of e-commerce adoption and the parameters to use when carrying out such a study.

The Government

Export Promotion Council, an arm of the government, interacts with these SMEs on a day-to-day basis helping them to use ICT to conduct international trade. The organization would therefore be keen to know how its programs can be tailored to fit these SMEs and even more importantly find ways to assisting SMEs benefit from e-commerce and hence contribute to national economic growth.

Business firms

Business firms in the ICT sector would also use the information to re-engineer their strategies towards serving SMEs. For example ISPs who may have been focusing on large firms and neglecting small ones would need to re-work their strategy and focus on the untapped potential lying with SMEs.

1.6 Problem formulation and solution to problem

1.6.1 Problem Statement

With the realization that e-commerce has a great potential for economic growth, the government of Kenya has committed itself in providing an enabling environment for its growth through initiatives like zero-rating ICT equipment, laying the under-sea fibre cable and establishing legislation e.g. Communication Act 2008. While studies indicate how different economies and countries have so far embraced e-commerce, no study has been carried out in Kenya to understand the extent to which various players have or continue to adopt e-commerce.

1.6.2 Purpose Statement

The purpose of this case study was to assess the level to which small and medium enterprises have adopted electronic commerce and are using it as information systems to better the well-being of the society.

1.6.3 Objectives of the study

The two main objectives of the study were:-

- To develop an understanding of the extent of e-commerce adoption amongst SMEs in relation to their use as information systems in business.
- To establish the factors that affect adoption of e-commerce by SMEs and propose solutions that would assist SME take advantage of e-commerce.

Sub objectives

- Measure the level to which SMEs have adopted ICTs as information systems of trade.
- Identify the various factors that deter SMEs from absorbing e-commerce and propose solutions.
- Get the perception that SMEs have towards ICT as a tool of trade

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

In this chapter we look at background data on SMEs, e-commerce and internet and the interplay between them. More specifically, on SMEs we look at available data on their size, importance and challenges they face while on e-commerce we take a critical look at its history, growth and the benefits that accrue from using it. On internet we look at issues like penetration and usage in Kenya versus other countries in the continent.

Small and Medium Enterprises (SMEs)

According to the National Micro and Small Enterprise Baseline Survey of 1999, the definition of SME is based on three criteria with the first one defining SME in terms of employment. It defines micro enterprises as those employing up to 10 workers (including the working owner) small enterprises as those having between 10 and 50 workers and medium-sized enterprises as those employing 50-100 workers. On the other hand, the World Bank describes an SME as a formally registered businesses, with 5 - 100 employees and with an annual turnover of between KSh 6 million and KSh 100 million. Other researchers (Mead and Morrison, 1996) and policy makers (Visser, 1997) have also attempted to define SMEs using different criteria. Morrison (1985) and Bigsten et al (1999)'s definition based on the number of employees confer with the Baseline's definition. They however have another definition based on the degree of legality. According to this criteria SMEs are those enterprises that are not registered and do not comply with legal obligations concerning safety, taxes, and labour laws. The other definition is based on their limited amount of capital and skills per worker. The degree of informality and the size of employment have been perhaps the most readily accepted criteria on which classification of SMEs is based (Morrison, 1985 and Bigsten et al,1999).

For simplicity sake therefore, this study has used the term SME to mean enterprises employing 1-100 workers and/or with annual turnover not exceeding KSh 100 million.

Electronic commerce

Electronic commerce, commonly known as e-commerce or eCommerce, is a term used to describe all commercial and related activities facilitated through the use of information technology and network technologies such as internet, extranet and intranets (Litondo, 2007).

Rayport and Jowski (2003) defines electronic commerce as technology mediated exchange of goods, services, and information that takes place between parties by means of the internet. This includes all those activities and processes that are included in trading steps of selling of information, products or services. Sakari (2005) explains that the amount of trade conducted electronically has grown extraordinarily since the spread of the Internet. A wide variety of commerce is conducted in this way, spurring and drawing on innovations in electronic funds transfer, supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), inventory management systems, and automated data collection systems. Modern electronic commerce typically uses the World Wide Web at least at some point in the transaction's lifecycle, although it can encompass a wider range of technologies such as e-mail as well.

A large percentage of electronic commerce is conducted entirely electronically for virtual items such as access to premium content on a website, but most electronic commerce involves the transportation of physical items in some way. Online retailers are sometimes known as e-tailers and online retail is sometimes known as e-tail. Almost all big retailers have electronic commerce presence on the World Wide Web.

Electronic commerce is generally considered to be the sales aspect of e-business. It also consists of the exchange of data to facilitate the financing and payment aspects of the business transactions (Litondo, 2007).

Information Communication Technologies (ICTs)

e-commerce is one of the applications of Information Communication Technologies (Litondo, 2007). According to Kashorda and Wagacha (2007), ICTs is the convergence of computing (software and hardware), telecommunication (mobile phones, fixed line, internet), and broadcasting. This convergence is certainly with us in Kenya. Mobile phone is the most popular ICT used among small businesses (Economic Forum, 2005). A significant number of SMEs in Kenya are however ignorant of ICTs and are unaware of their importance in conducting business, even in this era of globalization (Mitullah and Odek, 2002).

E-commerce adoption

E-readiness is the degree to which a community is prepared to participate in the networked world (Kashorda and Wagacha, 2007). From a social science point of view Rogers (1983) defines adoption as the decision by an organization to commit resources to an innovation. He

states that adoption is a second stage in an organizational innovation process coming after initiation then followed by implementation. Initiation includes pressure to change, and gathering and evaluation of information, culminating in adoption stage. Implementation includes development and installation activities to ensure that the expected benefits of the innovation are realized. While describing the technology adoption lifecycle, Rogers states that the model describes the adoption or acceptance of a new product or innovation. In this context therefore the terms adoption and acceptance are used to mean the same thing.

Based on this definition, this study defines e-commerce adoption as the decision by an organization to commit resources to use or accept e-commerce.

2.2 SME sector in Kenya

To be able to study SMEs, it is important to dig deeper into the background and understand who they are and the environment they operate in. According to a 2004 Kenya SME Country Study commissioned by the IFC, there are an estimated 22,000 SMEs in Kenya employing over 3.2 million people. Representing 66% of all formally registered private enterprises in the country, the SMEs accounted for 18% of the GDP.

The development contribution of SMEs is particularly significant in that SMEs are more labour intensive and tend to lead to a more equitable distribution of income than larger enterprises. They provide employment opportunities at reasonable rates of remuneration to workers from poor households and to women who have few alternative sources of income (Hobohm and Kennedy, 1999).

The Sessional Paper on SMEs of 1992 highlights benefits that accrue from promoting MSEs which include the fact that they contributed significantly to economy's output of goods and services. In addition, SMEs strengthen forward and backward linkages among socially, economically and geographically diverse sectors of the economy. The sector contributes an important market and supply point for products of rural enterprises, which are predominantly marketed to rural areas (Government of Kenya, 1992).

2.2.1 Challenges faced by SMEs

The National Baseline Survey of 1999 identified the following as operational challenges, 34% cited access to markets while 18% cited capital. Other constraints were inadequate business support services, poor roads, transport, shortage of raw materials, poor security and

lack of work site among others. Additionally, Sessional paper No 2 of 2005 on Development of Micro and Small Enterprises for Wealth and Employment Creation for Poverty Reduction, points out a number of challenges to development of SME sector. Some of these can be addressed by use of ICT; they include limited access to markets, limited access to information, inadequate access to skills and technology, limited linkages with large enterprises and inadequate business skills

2.2.2 Role of SMEs in Development

Within the private sector, SMEs play a particularly important role. It is widely recognised that SMEs form the backbone of the private sector at all levels of development in least developed countries (LDCs), and make a significant contribution to economic development in general and to industrial development in particular. Over 90% of enterprises in the world are SMEs which account for between 50% to 60% of employment, while SMEs engaged in manufacturing accounted for between 40-80% of manufacturing employment. Their contribution is even more important in the least developed countries of Africa, where they often offer the only realistic prospects for increases in employment and value added (World Bank, 2003)

In Kenya, the informal sector has greatly grown over time and plays an important role in job creation, reducing income inequalities, conserving foreign exchange, tapping small industrial and family savings for investment and creation of industrial skills at little cost (Government of Kenya, 1986 and Ikiara, 1991). It is against this backdrop that the Government of Kenya pledged to create 500,000 jobs annually with the understanding that "... the bulk of these jobs will come from the Micro and Small Enterprises sector" (Government of Kenya, 2005).

2.3 E-Commerce

2.3.1 Definition and scope of e-commerce

There is no universally accepted definition of the term "electronic commerce" or "e-commerce". However, it is generally used to cover the "distribution, marketing, sale or delivery of goods and services by electronic means" UNCTAD (2002).

Columbus (2002) defines e-commerce as the integration of communication technologies and multi-enterprise based applications that accentuate buying and selling of goods and services

between customers regardless of the platform or operating system being used on respective networks.

Digital technology has changed the economy. The primary source of value creation for consumers has shifted from physical goods to services and information. In essence, e-commerce is characterized by several attributes:

- It is about the exchange of digital information between parties.
- It is technology-enabled.
- It is technology-mediated - the place where buyers and sellers meet to transact business is moving from the physical world “marketplace” to the virtual world “marketplace”. Hence the success of the business rests on the screens and machines that manage customers and their expectations.
- It includes intra and inter-organizational activities that support the exchange - is a phenomenon that affects both how business organizations relate to external parties – customers, suppliers, partners, competitors and markets – and how they operate internally in managing activities, processes, and systems (Columbus, 2002).

2.3.2 Categories of e-commerce

Rayport (2003) categorizes e-commerce into four classes: business-to-business, business-to-consumer, consumer-to-consumer and consumer-to-business.

Business-to-business (B2B) refers to the full spectrum of e-commerce that can occur between two organizations. Among other activities, B2B e-commerce includes purchasing and procurement, supplier management, inventory management, channel management, sales activities, payment management and service and support.

Business-to-consumer (B2C) e-commerce refers to exchanges between businesses and consumers. Similar transactions that take place in the business-to-business e-commerce also take place in the business-to-consumer context.

A good example of B2C is when a client goes to a restaurant to buy lunch; even more technical is when one buys a car from one of Japan’s popular car auction like www.ibcjapan.co.jp.

Consumer-to-consumer (C2C) exchanges involve transactions between and among consumers. These exchanges may or may not include third-party involvement as in the case

of ibcJapan above where the buyer needs somebody to handle the payment and other logistical details. Other activities include games, jobs, mail and other personal services.

Consumer-to-business (C2B). Consumers can band together to form and present themselves as a buyer group to business in a C2B relationship. These groups may be economically motivated as with the demand aggregator, or socially oriented as with cause related advocacy groups.

		Business originating from...	
		Business	Consumers
... and selling to...	Business	B2B	C2B
	Consumers	B2C	C2C

Figure 1: Categories of e-commerce

2.3.3 Advantages and Disadvantages of e-Commerce

Joseph (2005) identifies the following as advantages and disadvantages of e-commerce.

Advantages of e-Commerce

Advantages of e-commerce step around convenience, cost and availability. The detailed description of each is as follows:-

1. **24 x 7 operation.** Round-the-clock operation is an expensive proposition in the 'brick-and-mortar' world, while it is natural in the 'click-and-conquer' world.
2. **Global reach.** The net being inherently global, reaching global customers is relatively easy on the net compared to the world of bricks.
3. **Cost of acquiring, serving and retaining customers.** It is relatively cheaper to acquire new customers over the net; thanks to the 24 x 7 operation and its global reach. Through innovative tools of 'push' technology, it is possible to retain customers' loyalty with minimal investments.

4. ***An extended enterprise is easy to build.*** The Internet provides an effective (often less expensive) way to extend your enterprise beyond the narrow confines of your own organization
5. ***Disintermediation.*** Using the Internet, one can directly approach the customers and suppliers, cutting down on the number of levels and in the process, cutting down the costs.
6. ***Improved customer service to clients.*** It results in higher satisfaction and more sales.
7. ***Power to provide the 'best of both the worlds'.*** It benefits the traditional business side-by-side with the Internet tools.
8. ***Technology-based customer interface.*** The customer in the electronic environment is a 'screen-to-face' interaction through use of PC based monitors, PDAs, ATMs, or other electronic devices. Operationally, these types of interfaces place an enormous responsibility on the organization to capture and represent the customer experience. Thus, the 'screen-to-customer' interface has the potential to both increase sales and decrease costs.
9. ***The customer controls the interaction.*** At most websites, the customer is in control during screen-to-face interaction, in that the Web largely employs a 'self service' model for managing commerce or community-based interaction.
10. ***Knowledge of customer behaviour.*** While the customer controls the interaction, the firm has unprecedented access to observe and track individual customer behaviour. In more strategic terms, an online business can actually position offers and merchandise in ways that uniquely appeal to specific customers.

Disadvantages of e-Commerce

Joseph (2005) points out that most of the disadvantages of e-commerce stem from the newness and rapidly developing pace of the underlying technologies. Such hiccups are expected to fade out as e-commerce matures and becomes more and more available to and gets accepted by the general population.

1. ***Difficult to evaluate before investment.*** Businesses often calculate the return-on-investment before committing to any new technology. This is difficult with e-commerce, since the costs and benefits are hard to quantify. Costs, which are a function of technology, can change drastically even during short-lived e-commerce implementation projects.

2. **Recruiting and retaining staff.** Many companies have a problem recruiting and maintaining employees with technological, design and business process skills needed to create an effective e-commerce atmosphere.
3. **Difficult of integration.** Many companies have difficult in integrating existing databases and transaction-processing software designed for traditional commerce into a software that enables e-commerce.
4. **Cultural and legal obstacles.** Some consumers are fearful of sending their credit card details over the Internet. Other consumers are simply resistant to change and are uncomfortable viewing merchandise on a computer screen rather in person.

2.3.4 Potential of e-Commerce for SMEs

Sakari (2006) argues that firms can increase and improve their performance in international trade through the use of e-commerce. He states that e-commerce will increase the availability of relevant and timely information and reduce transactions times. This, in turn, is expected to greatly improve developing country firms' access to international markets. Given the availability of an adequate infrastructure, firms are expected to invest in e-commerce applications, especially if they intend to trade with distant customers and suppliers.

UNCTAD (2001) emphasises this by arguing that the business enterprises can better position themselves to engage in trade as a tool for development if they adopt e-commerce. Firms are expected to benefit for two main reasons. First, the products produced by firms in the developing countries like Kenya are often uncompetitive because of high transport costs and inefficient trade procedures, the latter of which can be partially overcome by the use of e-commerce. Second, e-commerce may allow these firms to diversify into new sectors where they can benefit from their low labour costs. e-commerce is expected to ease the entry of firms into global markets by allowing them better access to information and to overcome inefficiencies, thereby enabling them to make more advantageous decisions about their participation in international trade.

In its report titled *Achieving development through science and technology (2005)*, UNCTAD reports that applying the advantages of modern science and technology can improve living conditions and help most countries meet the Millennium Development Goals (MDGs) by 2015 and help lessen the socio-economic gap between the rich and the poor. When used appropriately, taking into account differing needs and levels of development

around the world, science and technology – in agriculture, health, trade, infrastructure, education, etc can promote all of the various forms of progress referred to under the blanket term of “development”. Poverty can be reduced, health improved, jobs created.

This study contributes to the debate about the impact of e-commerce on firms in developing countries by examining its use in Kenya. The study provides a basis for assessing the extent of adoption and the perceptions of the impact of e-commerce in Kenya on firms that are trading in global markets.

2.3.5 Challenges with e-Commerce

According to Chege (2002), one of the challenges of e-commerce is that merchants need to be assured that they will be paid for their sales while buyers need to be assured that the goods and services they paid for will be delivered. Because it is difficult to verify the authenticity or good faith of users over the internet, the sellers will have to advise buyers to observe the age-old rule of *caveat emptor*.

In his paper on the challenges of e-commerce Rusu (2008) identified the regulatory framework, the situation of IT&C market, the (limited) use of credit cards and other ways of electronic payment, cyber space (in)security and the level of computer literacy, the penetration of mobile telephony as a basis for mobile Internet access as main obstacles of e-commerce.

The government of Kenya also points out specific challenges as being policy, legal and regulatory framework, lack of adequate ICT infrastructure, limited universal access and the absence of a firm institutional framework to govern ICT human resource (Government, 2002). A study done by Mitullah and Waema (2005) on e-governance in Kenya outlined four critical issues which are likely to pose challenges to the successful utilization of ICTs, namely:-

- a) ICT human capacity – the human technical and managerial capacity was inadequate.
- b) Change management strategy – the capacity to manage the change needed for e-governance was lacking.
- c) Funding - the amount of resources required for the change was huge, yet the resources allocated were negligible.

- d) Access to ICT – this posed a lot of challenges among the urban poor, rural and remote areas where the majority of the population lives. B2G e-commerce is very important in enhancing e-commerce and the level of e-government is one of the indicators of e-commerce readiness.

2.3.6 Selected example of e-commerce in use

In its report UNCTAD(2005) confirms that there is now growing evidence that enterprises benefit substantially from e-business. New technologies, and in particular the Internet, transform economic sectors and allow them to do business faster and better. With the increased use of mobile money transfer, Kenyan businessmen and individuals are now paying for their electricity and water bills as well as honouring other obligations (e.g. paying for goods/services delivered/rendered). Additionally, the working class are able to send money to their relatives in the villages who use it for various economic activities.

Outsourcing is another promising economic activity. Companies in industrialized countries are taking advantage of the growth in ICT capacities in the developing world to commission online services. PrecissPatrol (www.precisspatrol.biz), for instance, is a successful Kenyan company that offers back-office services, such as data mining and specialized research, to customers worldwide. This kind of e-business is no longer an exception in Africa and every month new ones are being set up.

Governments are also benefiting from ICT for their own activities. The Government of Brazil, for example, saved US\$ 1.5 million in the first two years of using its web-based online procurement system, and reduced delays from over two months to less than 15 working days.

2.3.7 What steps has Kenya taken in e-commerce

In the recent past, the government has made concerted efforts to promote ICT and e-commerce; in the 2006 budget speech for example, the government zero-rated computers and their peripherals. This move saw the reduction in the cost of PCs from a high of KSh 200,000 to as low as KSh 35,000. Additionally in 2009's budget, the government zero-rated VAT on mobile phones and other communication equipment. These efforts have made it possible for many institutions and households to purchase and use phones and computers. To address the high cost of bandwidth, the government, in collaboration with the private sector, committed KSh 14 billion project to lay fibre optic cable connecting the country to the rest of the world via the United Arab Emirates (UAE) in the Middle East. The cable, whose capacity is in the

region of 120 terabytes, is aimed at reducing both telephone and bandwidth costs making the country competitive in the booming outsourcing business that has helped economies such as India's take off (Business Daily, 2009).

The government has also set up an e-government body (www.e-government.go.ke) whose key objectives are to improve collaboration between government agencies, improve Kenya's competitiveness by providing timely information and delivery of government services; reduce transaction costs for the government, citizens and the private sector through the provision of products and services electronically; and provide a forum for citizens' participation in Government activities

The digital villages is yet another initiative by the e-government to have ICT reaching the local person in his habitation. It is expected that the digital villages will issue government documents, conduct general census survey and act as local business outsourcing units targeting government and private companies. To build capacity, the Ministry of Information is training 500 youth groups in the rural areas on how to commercialize ICT services (TechNews, May 2008).

Policy framework - Policies and strategies for fast-tracking ICT in Kenya include National ICT Policy; Sessional Paper No 1 of 2005; National Information Technology ICT strategy for Education and Training of 2006; the E-government Strategy; the Economic Recovery Strategy on Wealth and Employment Creation 2003-007, Vision 2010 (Hon Kagwe, 2007) , Vision 2030 and Communication Act 2008.

Under the second pillar which covers socio-economic transformation, the Kenyan government through its Vision 2030 blueprint (Government of Kenya, 2007) recognizes the role of science, technology and innovation (STI) in modern economy, in which new knowledge plays a central role in boosting wealth creation, social welfare and international competitiveness. To promote Business Process Outsourcing (BPO), Vision 2030 outlines several strategies namely establishment of a BPO park in Nairobi, mounting of marketing and training campaigns, provision of good telecommunication infrastructure (especially the under sea cable) and provision of incentives

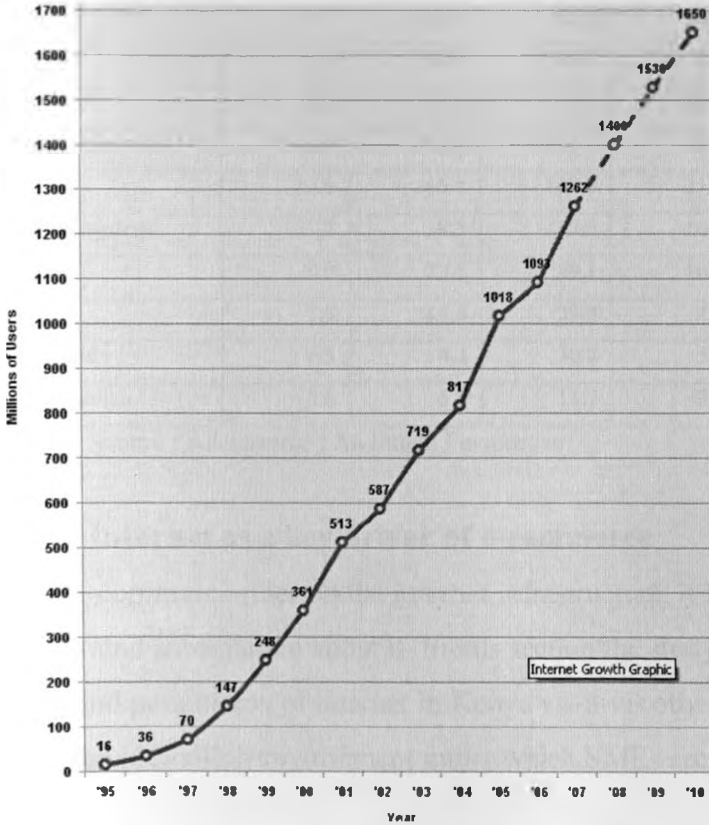
All these efforts will bear good fruit only if the infrastructure is put to good use by both business people and the general public. Its for this reason that this study has focused on the adoption of e-commerce by Small and Medium Enterprises.

2.3.8 Worldwide e-Commerce Growth

According to Joseph (2005) the internet is profoundly changing consumer behaviour. One in every consumer walking into a department store in America to buy an electrical appliance would have researched the product online – and would know down to a dime what they wanted to pay.

Looking at the global trend over the past years, there is a strong indication that e-commerce is the way to go. The chart below depicts this trend over a period of years from 1995 to 2010.

Figure 2 : World Internet growth 1995 - 2010



Source: <http://www.internetworldstats.com/emarketing.htm>

Joseph (2005) affirms that half of the 60 million consumers in Europe who have an Internet connection bought products offline after having investigated prices and details online. He states that a company that neglects its website may be committing commercial suicide. He depicts the worldwide e-commerce transactions (in \$) in the table below.

Table 1: Worldwide e-Commerce growth

	Worldwide e-commerce transactions (in \$)					% of total sales in 2004
	2000	2001	2002	2003	2004	
Total (\$billion)	657.0	1,233.6	2,231.2	3,979.7	6,789.8	8.6
North America	509.3	908.6	1,498.2	2,339.0	3,456.4	12.8
United States	488.7	864.1	1,411.3	2,187.2	3,189.0	13.8
Canada	27.4	38.0	68.0	109.6	160.3	9.2
Mexico	3.2	6.6	15.9	42.3	107.0	8.4
Asia Pacific	53.7	117.2	286.6	724.2	1,649.8	8.0
Japan	31.9	64.4	146.8	363.6	880.3	8.4
Austria	5.6	14.0	36.9	96.7	207.6	16.4
Korea	5.6	14.1	39.3	100.5	205.7	16.4
Western Europe	87.4	194.8	422.1	853.3	1,533.2	6.0
Germany	20.6	46.4	102.0	211.1	386.5	6.5
United Kingdom	17.2	38.5	83.2	165.6	288.8	7.1
France	9.9	22.1	49.1	104.8	206.4	5.0
Italy	7.2	15.6	33.8	71.4	142.4	4.3
Netherlands	6.5	14.4	30.7	59.5	98.3	9.2
Latin America	3.6	6.8	13.7	31.8	81.8	2.4

Source : e-commerce , An Indian Perspective

2.4 Internet as a key driver of e-commerce

Since e-commerce rides on the internet infrastructure, it is important to look at the background information about it. In this section the study takes a critical look at the growth, usage and penetration of internet in Kenya vis-à-vis other countries. This helps to bring into focus the prevailing environment under which SMEs are exposed to.

2.4.1 Background on Internet situation in Kenya

Communication Commission of Kenya (CCK), through its website www.cck.go.ke reports that Internet was introduced in Kenya in early 1990s, largely led by Kenyans returning from overseas studies, Western ex-patriots, and Inter-Governmental Organization (IGO) and Non-Governmental Organization (NGO) personnel. The key challenges in the 1990s were the limited and high cost of international Internet bandwidth, the high cost of both dial-up and domestic leased lines, the limited penetration of PCs, limited capacity and poor quality fixed infrastructure, lack of an Internet policy and regulatory environment and the lack of appropriate IT skills. By 2002, there were eight television stations as compared to one a decade ago. Community radio broadcasting has also been liberalized but only FM stations are

permitted to broadcast in the liberalized market. By the same year, Telkom had a total of 330,000 telephone connections in urban and rural areas and the ratio of urban to rural connections was 60:40 despite the fact that 80% of the population of Kenya is located in rural areas. About 70% of the telephone connections were based on analogue technology and the remaining connections were based on digital technology.

Electronic communication using computer networks began to gain ground in Kenya in the 1990s and have expanded rapidly. In 1996 for example there were nine licensed ISPs and this number had risen to 51 by 2007 (CCK, 2008). Some of the main ISPs operating in Kenya are: UUNET, Swift Global, Nairobinet, Access Kenya, Wananchi online, and Kenya Web.

2.4.2 Key Internet trends from 2000 to 2007

The Kenyan Government has initiated numerous interventions that have seen tremendous growth in internet since 2000. The table below shows the trend between 2000 and 2007.

Table 2 : Internet trends from 2000 to 2007

	2000/01	2001/ 02	2002/ 03	2003/04	2004/05	20005/06	2006/07
Number of licensed ISPs	34	66	72	76	78	51	51
Users by ITU (estimates)	100,000	200,000	400,000	1,000,000	1,054,920	1,111,000	2,770,296
64 Kbps leased line tariffs	14,400	14,400	14,400	14,400	14,400	14,400	7,200
2 Mbps leased line tariffs	96,477	81,457	81,457	81,457	81,457	81,457	40,728.5

Source: Telkom Kenya, CCK, Internet Market Study

The laying of undersea optical fibre cable to connect the country to the rest of the world and the zero rating of value added tax on both computers and communication equipment are some of the interventions that have been very much welcome in the country. These have resulted to internet cost dropping to a low of US\$ 600 per 1MB of bandwidth.

2.4.3 Internet Usage and Population Growth

From the table below, the country has recorded an increased internet usage since 2000. This implies that more and more people are getting to use the internet. This would therefore imply that business has to increasingly change focus from the real to cyber world.

Table 3: Internet usage and population growth

YEAR	Users	Population(m)	% Pen.
2000	200,000	30	0.7 %
2006	1,054,900	34	3.1 %
2007	1,111,000	35	3.2 %
2008	3,000,000	37	7.9 %
2009	3,359,600	39	8.6 %

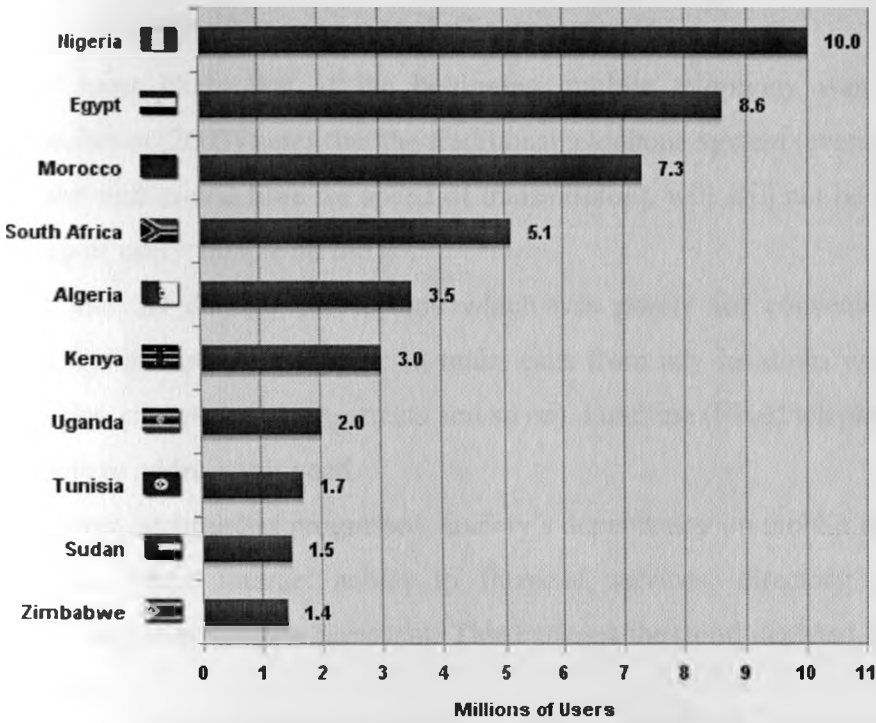
Source: <http://www.internetworldstats.com/af/ke.htm>

The increased penetration of 8.6% in 2009 from 0.7% in 2000 clearly indicates the strong internet potential in the country.

2.4.4 Internet usage statistics

Internet Growth: Top 10 African Countries as in March 2008. Kenya is at position 6 in the continent after Nigeria, Egypt, Morocco, South Africa and Algeria.

Figure 3: Internet usage statistics



Source: Internet World Stats - www.internetworldstats.com

2.4.5 Internet Penetration

On the rate of internet penetration, in the top 20 countries in Africa Kenya is placed 10th with a penetration rate of 7.9 %.

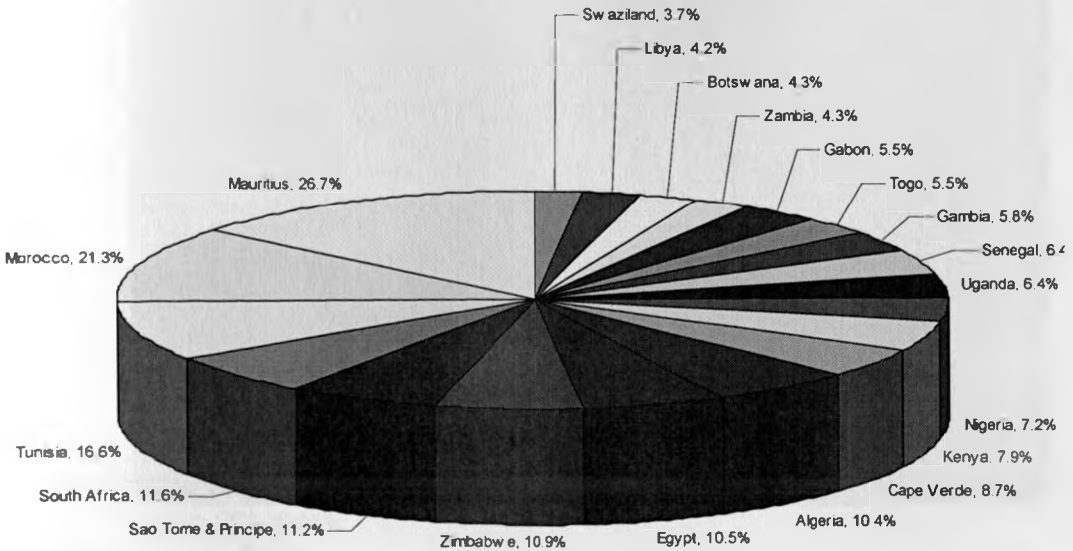


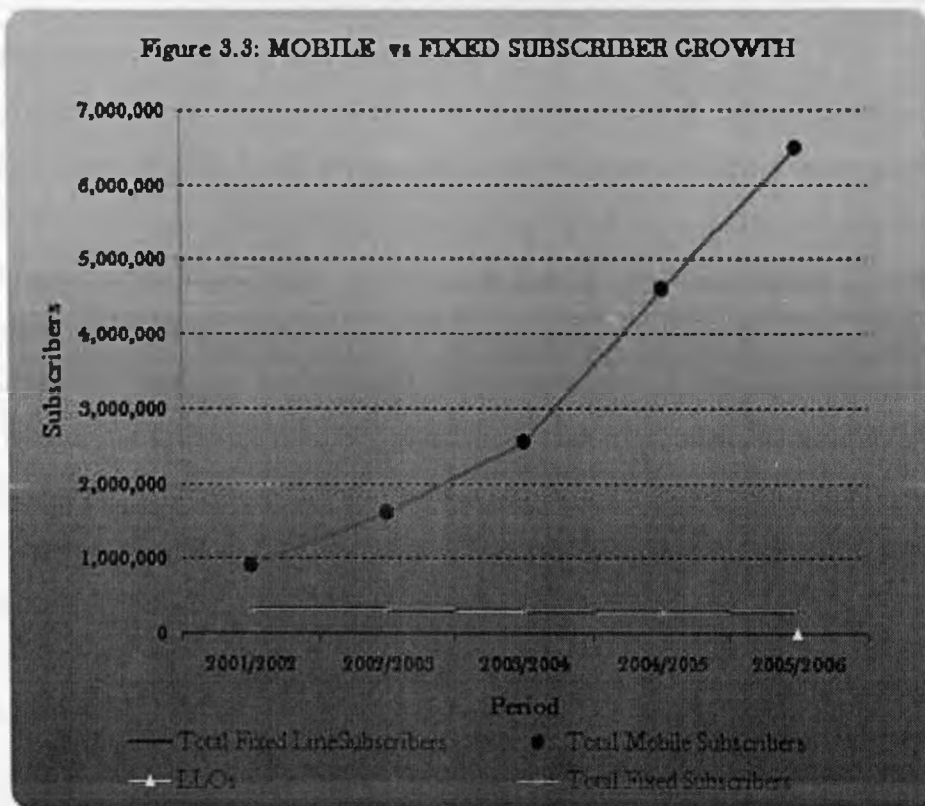
Figure 4: Internet Penetration

2.5 Mobile phones as a tool of e-commerce

It is most likely that at the beginning, mobile telephony was demand/society driven. Tanenbaum (2003) notes that the traditional telephone system (even if it some day gets multi-gigabit end-to-end fibre for speed of transmission), will still not be able to satisfy a growing group of users: people on the go.

Just like the demand for laptops which was purely for convenience, mobile users were looking forward to being able to make calls from any locations with all the convenience (in vehicles, planes, hallways, streets and so on). Landline (Fixed telephony service) would never be able to address this need.

However, as time has progressed, society's dependency on mobile technology is increasingly evident. From Internet access to financial services, directory and advertising, mobile technology has become prevalent. This explains the trend depicted in the graph below (CCK website).



Source: CCK Website

Since their invention, mobile phones have and continue to undergo a lot of transformation. In earlier 2000 most mobile phones were mainly used for voice service but today both mobile service providers and manufacturers have considered voice to be very basic and have added

so many advanced features like mobile banking, internet, music, camera etc making this gadget an integrated tool (Business Daily, June 2009)

Available figures from Communication Commission of Kenya indicate that the number of mobile phone subscribers has increased from 15,000 in 1999 to 17.6 million in 2009 a figure that represents 43.9% penetration. Further there are 7 million subscribers of m-pesa (CCK website, 15th September 2009),

Recently, one of the local banks entered into partnership with Safaricom to have clients access their money through mobile phone. Through mobile banking, unsigned customers are allowed to check their balances, top up mobile lines, receive mini statements and perform money transfer functions. This creative innovation was cited as the first in the world (Standard Newspaper, 15th September 2009)

With the many advantages that go with it e.g. wider reach, affordable cost of communication, integrated services and convenience of service, small and medium enterprisers should make use of this tool to do business.

2.6 Conclusion from the literature review

From the literature, it has been established that there is a lot of potential for e-commerce. The conventional commerce is slowly being replaced by e-commerce hence every business entity need to adopt it lest it commits “commercial suicide”. SMEs in particular are at the centre-stage in the economic development of Kenya having a contribution of over 18% to the GDP and providing employment to many Kenyans.

On providing an enabling environment for e-commerce, Kenya’s government has and continue to endeavour doing so. The initiatives so far implemented include zero rating of value added tax on computers, mobile phones and communication equipment and investing Sh.14 billion in the undersea fibre cable which has seen drastic reduction in the cost of internet bandwidth.

Internet penetration using PCs is as low as 8.6% while mobile phone penetration is as high as 43.9%. Additionally, the literature confirms that there is increasing use of mobile money transfer having over 7 million subscribers of M-Pesa. Evidently there are many users of mobile phones than there are PC users. For this reason, the study has paid a little more attention on adoption of e-commerce via mobile phones.

CHAPTER THREE

3.0 THEORETICAL FRAMEWORK TO THE STUDY

3.1 Introduction

Information Systems (IS) researchers have made significant efforts in building theories to examine and predict the determinant factors of Information Technology (IT) acceptance (Agrawal and Prasad, 1998; Agrawal and Prasad, 1999). Existing models of IT acceptance have their foundations from several diverse theories, most noticeable is the innovation diffusion theory, where individuals' perceptions about using an innovation are considered to affect their adoption behaviour (Agrawal and Prasad, 1998; Moore and Benbasat, 1991; Rogers, 1995). Other important theoretical models that attempt to explain the relationship between user beliefs, attitudes, intentions, and actual system use include the Theory of Reasoned Action (TRA) (Ajzen and Fishbein, 1980), the Theory of Planned Behaviour (TPB) (Ajzen, 1991), and the Technology Acceptance Model (TAM) (Davis, 1989; Davis et al., 1989). Of all these the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al, 2003) has been selected for this study.

3.2 Model background

Venkatesh et al (2003) integrated the elements of eight prominent models into a Unified Theory of Acceptance and Use of Technology (UTAUT). They empirically validated the model with six longitudinal field studies of six different departments of six large firms in six different industries. UTAUT accounted for 70 percent of the variance in usage intention, better than any of the eight models alone. UTAUT is held up as "a definitive model that synthesizes what is known and provides a foundation to guide future research in this area...." The model has four core determinants of intention and usage, and up to four moderators of key relationships.

The model notes that performance expectancy appears to be a determinant of intention in most situations: the strength of the relationship varies with gender and age such that it is more significant for men and younger workers. The effect of effort expectancy on intention is also moderated by gender and age such that it is more significant for women and older workers, and those effects decrease with experience. The effect of social influence on intention is contingent on all four moderators included such that it was found it to be non-significant when the data were analyzed without the inclusion of moderators. Finally, the effect of facilitating conditions on usage was only significant when examined in conjunction with the

moderating effects of age and experience - i.e., they only matter for older workers in later stages of experience (Venkatesh, 2003).

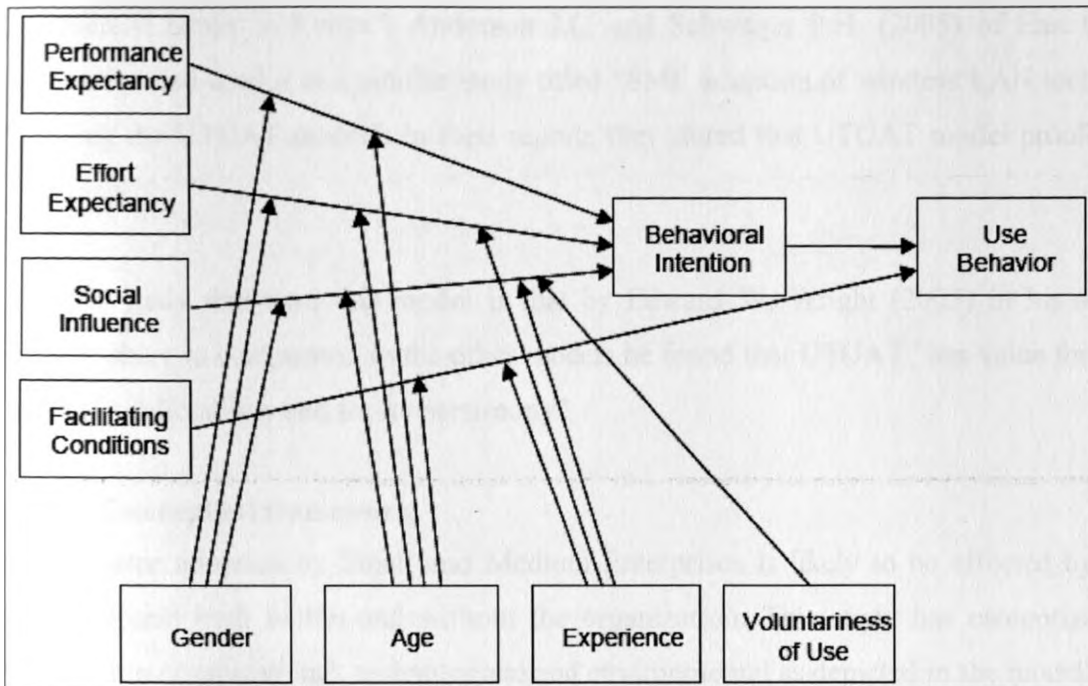


Figure 5 : UTUAT Model

Seven constructs appeared to be significant direct determinants of intention or usage in one or more of the individual models. Of these, four constructs play a significant role as direct determinants of user acceptance and usage behaviour: performance expectancy, effort expectancy, social influence, and facilitating conditions. Attitude toward using technology, self-efficacy, and anxiety are theorized not to be direct determinants of intention. The labels used for the constructs describe the essence of the construct and are meant to be independent of any particular theoretical perspective. There are four factors that play the role of moderators these are gender, age, voluntariness, and experience.

3.3 Justification for using the UTUAT model

The model was chosen for the study because of its suitability to the topic. This stems from the fact that e-commerce is rides on technology and factors that influence acceptance and use of technology directly affect e-commerce.

This model provides a unified view of technology adoption because a) it reviews the extent of user acceptance models b) it was developed based on the conceptual and empirical similarities across eight other models and c) it has been empirically validated and so far, the most current model (Venkatesh et al, 2003).

Various similar studies have been carried out using this model; Otieno (2006) used it in a study entitled “An investigation into internet banking technology adoption among commercial banks in Kenya”. Anderson J.C. and Schwager P.H. (2005) of East Carolina University also used it in a similar study titled “SME adoption of wireless LAN technology: applying the UTUAT model”. In their reports they stated that UTUAT model proved to be very helpful.

Another study that used this model is that by Edward W. Wright (2005) in his doctorate degree where in comparison to the other models he found that UTUAT “has value for its high level of predictability and for its parsimony”

3.4 Conceptual framework

e-commerce adoption by Small and Medium Enterprises is likely to be affected by certain factors found both within and without the organization. This study has categorized these factors into organizational, technological and environmental as depicted in the model on page 29.

The study pessimistically hypothesizes that
SMEs have not adopted e-commerce

3.4.1 Organizational factors

There are four organizational factors that have been discussed with relation to adoption; they are size, centralization, formalization and specialization. Size is considered to be one of the main influencing factors to innovation, adoption and even implementation of any idea. Larger firms are likely to have the ability to absorb more risk than smaller ones. Additionally larger firms, due to their ability to marshal resources, are likely to venture into new ideas than smaller ones. In this study, it is expected that larger SMEs would have resources and infrastructure to adopt e-commerce. These support the hypothesis that

H1a Size of an SME positively influences its adoption of e-commerce

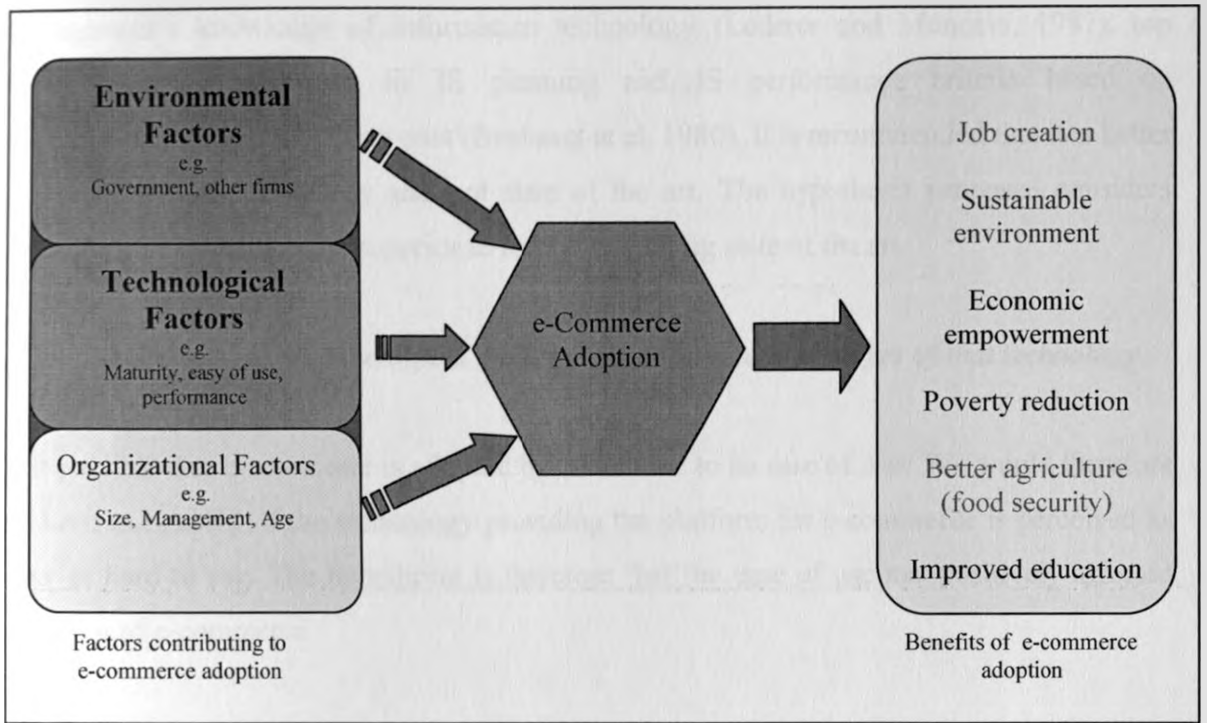


Figure 6: Conceptual framework

Gender, age and experience of top management are influencing factors to e-commerce adoption. Generally, we would expect SMEs headed by young managers to be quick in taking up new ideas. Male managers with more experience are also expected to adopt new ideas than their female counterparts. The study would therefore like to confirm the hypotheses that

H1b Gender of management influences e-commerce adoption such that male managers are more likely to adopt it than their female counterparts.

H1c Age of management directly influences e-commerce adoption such that young managers are more likely to adopt it than old managers.

It was also encouraging to establish if there existed any relationship between the age of an SME and its readiness to adopt e-commerce. The study proposes the hypothesis that

H1e The age of an SME negatively affects its adoption of e-commerce such that young establishments are more receptive.

3.4.2 Technological factors

Many IS characteristics have also been discussed in the literature that describe factors associated with “better or more mature” IS departments. These characteristics are top

management's knowledge of information technology (Lederer and Mendelo, 1987), top management's involvement in IS planning and IS performance criteria based on organizational goals rather than cost (Benbasat et al, 1980). It is recommended that it is better to choose mature technology and not state of the art. The hypothesis proposed considers technological maturity to be superior to technology being state of the art.

H2a SMEs consider Technological maturity more than state of the art of that technology .

Is it possible that e-commerce is adopted by SMEs due to its ease of use? We would therefore be keen to establish if the technology providing the platform for e-commerce is perceived as easy or hard to use. The hypothesis is therefore that the ease of use has positively affected adoption of e-commerce

H2b Ease of use of technology positively affects e-commerce adoption by SMEs.

Performance expectancy also affects the intention to adoption any given technology. We therefore hypothesize that technology whose performance expectancy is high is more likely to be adopted than if the expectancy is low.

H2c Performance expectance of technology positively affects e-commerce adoption by SMEs.

3.4.3 Environmental factors

Under the environmental factors there is the government, other peer firms and society in general. Since SMEs, like any other entity, do not exist in a vacuum; this study would wish to establish how the environmental factors have contributed to adoption of e-commerce. We would therefore wish to test the hypothesis that social influence positively affects e-commerce adoption by SMEs.

H3a Social influence positively affects e-commerce adoption by SMEs

CHAPTER FOUR

4.0 RESEARCH METHODOLOGY

4.1 Introduction

This chapter looks at the method of execution of the study to attain the desired objective. These include the research design, population, data collection and analysis.

4.2 Research Design

The research is a case study of 22 SMEs seeking to establish the level of adoption of e-commerce by SME. Tull and Albaum (1973) define a case study as an in-depth exploration of a particular context, such as a classroom or group of individuals that involves the collection of extensive qualitative data usually via interview, observation, and document analysis. Kinyanjui et al, (2002) successfully used the case methodology in a similar study entitled “e-Commerce in the garment industry in Kenya, Usage, Obstacles and Policies” and reported to have successfully accomplished his objective.

4.3 Population and Scope

The population of interest covers all SMEs in the republic of Kenya whose total is about 22,000 according to the SME Baseline survey. Out of this the cross-sectional study sampled 22 individual SMEs. The respondents were randomly picked from the long list of SMEs available in the records of Export Promotion Council (EPC).

Previous research on strategic issues in companies indicated that the respondents chosen are mainly chief executive officers (Gekongo, 1999). Additionally, Muya (2006) indicates that in many companies, general managers are the ones mainly involved in the day-to-day running of the business operations. For this reason therefore the study used senior members (e.g. the directors, proprietors) of staff as respondents.

The interviewees (full list attached in appendix I) were drawn from the following sectors which have been prioritised by EPC.

- Commercial crafts
- Honey
- Manufacturing
- Horticulture
- Coffee
- Tea
- Services

4.3.1 Measures & instruments

The study looked at the following variables:-

- a) The level of adoption of e-commerce amongst SMEs
- b) The number of computers/phones per SME
- c) The percentage of SMEs having internet presence
- d) Time and money committed to or spent on internet.
- e) The percentage of SMEs actively using ICT tools in the day to day business operations
- f) The contributing factors to the absence/presence of ICT tools in the business
- g) The challenges that SMEs encounter in using ICT tools
- h) The perceptions that SMEs have towards e-commerce.

4.3 Data Collection

A structured closed/open questionnaire was designed and disseminated in various ways: while majority were sent through email and through the various EPC offices, a few questionnaires were filled through telephone interviews where the respondents were called and interviewed on phone. Their response was filled in the questionnaires by the interviewer.

A good number of respondents were also found at the training sessions that EPC held in Mombasa and Kisumu. Respondents were therefore requested to fill the questionnaires and hand them back after the session.

As much as possible 3-5 point likert scale was used to determine the extent of e-commerce absorption. The targeted respondents were the SMEs who had ever used EPC service and hence their contacts were available.

4.3.1 Justification for the instrument

The choice to employ a questionnaire as a data collection instrument is prompted by the fact that this tool is the most conveniently used to gather information from respondents who are geographically spread out. In this study SMEs were drawn from different parts of the country hence the wide spread.

Earlier studies that successfully used this tool include Otieno (2006) where she investigated adoption of internet banking by commercial banks. UNCTAD used the same tool in a closely related study entitled "Measuring the impact of ICT use in business: the case of

manufacturing in Thailand (2008) which looked at the SMEs who use computers and internet, those with websites and the contributing factors. The parameters used in both studies are very similar to what this project was handling.

4.4 Data Analysis

The data was analysed and summarized using Excel spreadsheet and SPSS package as tools of inferential and descriptive analysis such as the measure of central tendency, mean, standard deviation, frequency distribution and percentages. The study sought to establish the extent to which SMEs have adopted ICT as information systems in trade. It also looked at the factors that contributed to adoption of e-commerce amongst these SMEs.

In consideration of the definition of adoption as the decision by an organization to commit resources to an innovation (Rogers, 1983), this project has considered expressing adoption as a function of variables that constitute commitment of resources to e-commerce. It expresses adoption of e-commerce (A_{ec}) as

$$(A_{ec}) = \left\{ \frac{A + B + C + D + E}{5} \right\}$$

where

A = average score of the degree of use of e-tools (e.g. mobiles phone, computer) by an SME

B = average score of e-tools owned by an SME

C = average score on use of e-services (e.g. sending money via phone, doing business via email etc) by AN SME

D = average score of time spent on the internet per month by an SME

E = average score on annual budgetary allocation for internet access by an SME

CHAPTER FIVE

FINDINGS AND DATA ANALYSIS

5.1 Introduction

This section provides the data analysis and findings of the study. The data was analysed using frequencies, percentages, means and standard deviations and presented in tables and charts.

5.2 SME demographic information

The variables considered in this section were mainly aimed at providing insight information of the various SMEs. The study looked at the mix of the SMEs in the targeted sectors, location, gender of the management and number of employees among others.

5.2.1 Response Rate

From a total of 28 SMEs who were invited to participate in the study, 2 declined to participate while 26 questionnaires were filled and returned within the specified period. Out of the 26, 4 were declared unusable since 3 were incomplete and 1 was from a respondent who stated that the enterprise was still under feasibility study. This left 22 usable questionnaires which yielded a response rate of 79 % which was considered adequate enough for the purpose of this study.

5.2.2 Sector Mix

Out of the 22 SMEs who participated in the study, 40% were in handicrafts, 23% in horticulture followed by tea, textiles and services all with 9% while honey and leather were at the tail end with 5% each as indicated in the pie chart below:-

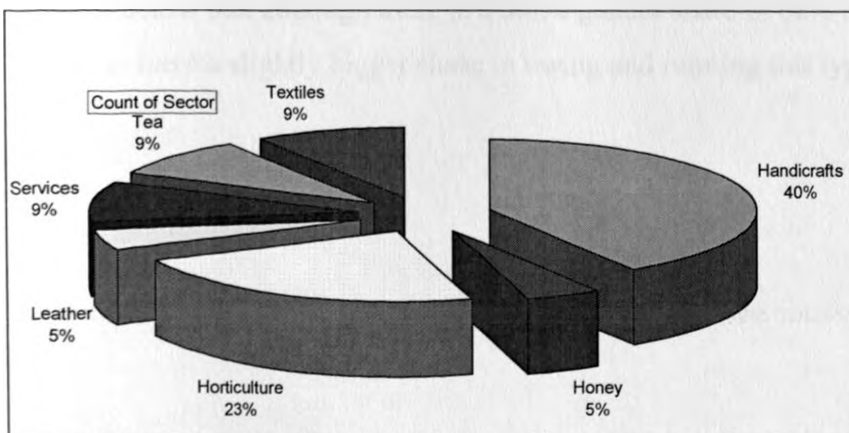


Figure 7: Sector Mix

5.2.3 Location

As depicted in figure 8 below, the majority of the SMEs under the study were in urban areas (14) with only 6 and 2 located in the semi-urban or rural areas respectively.

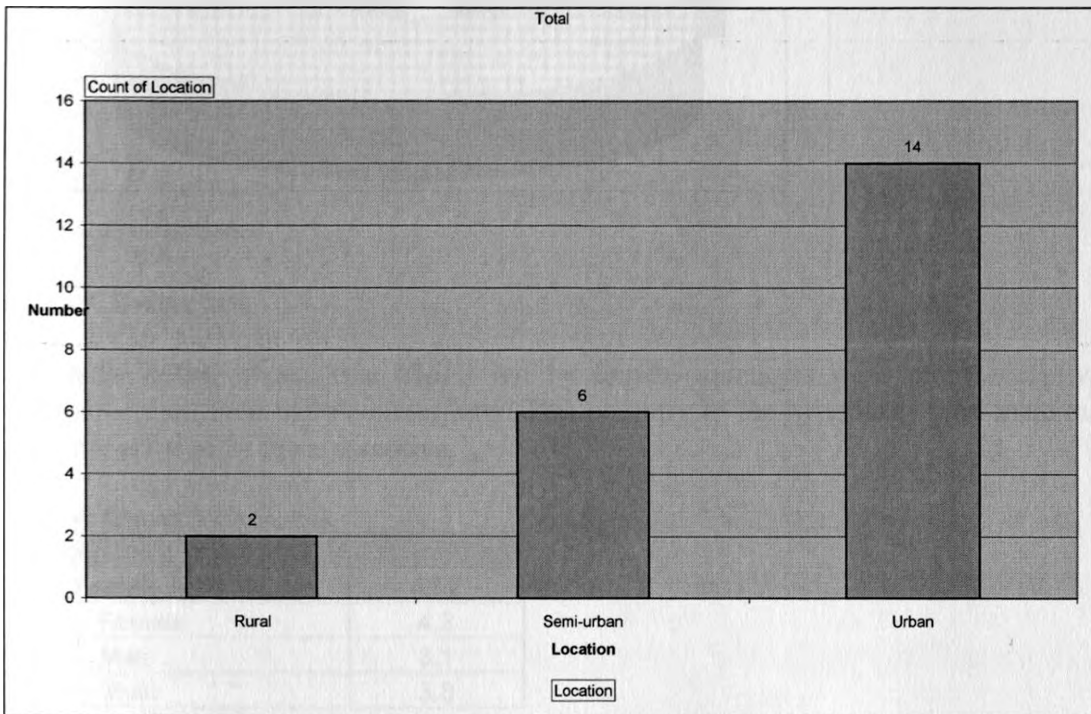


Figure 8: Location of respondents

5.2.4 Gender of the management

As reported in the new policy and strategy framework for development of micro and small enterprises in Kenya, about 48% of SMEs are owned by women. This study confirms this in figure 9 below that although there is a 50:50 gender share in 68% of the SMEs sampled, men appear to have a slightly bigger share in owing and running this type of enterprises.

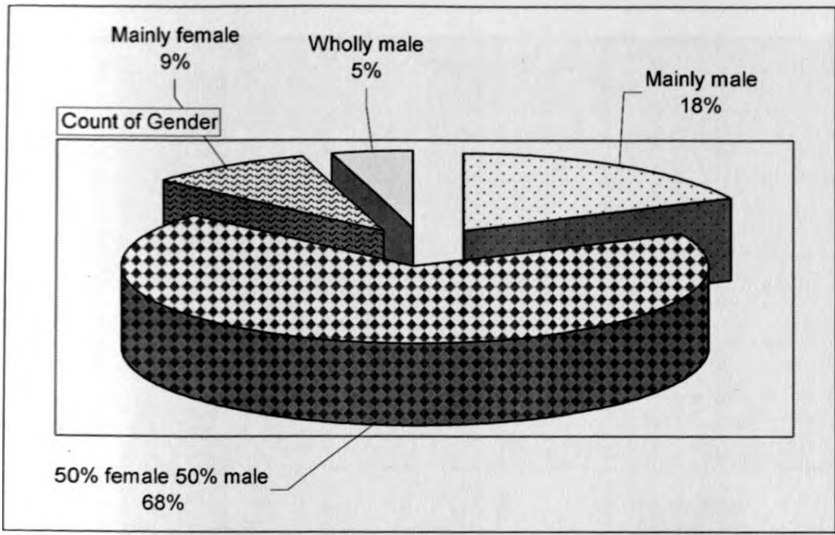


Figure 9: Gender Mix

The table below shows that SMEs led by female managers were more receptive to e-commerce than their male counterparts. This contrary to the hypothesis than male managers were expected to be more receptive.

Table 4: Gender Vs Adoption

Gender	Score
50% Female 50% Male	4.52
Mainly Female	4.2
Mainly Male	3.1
Wholly Male	3.8

5.2.5 Number of employees

The study found out that 68% of SME employee between 1 and 10 employees leaving 32% with between 11 and 100 employees.

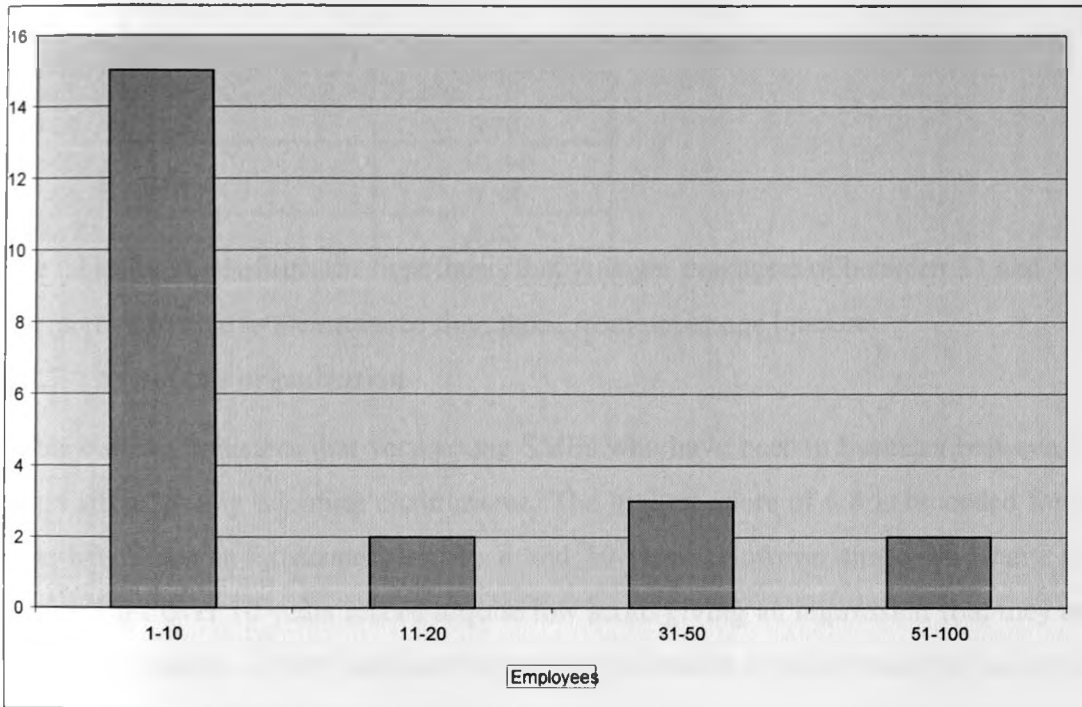


Figure 10: Number of employees

5.2.6 Age of management

Of the SME analysed, 63% are led by relatively young management aged between 31 and 40 years. Only 5% were between 20 – 30 years old implying that this age bracket comprises of people who are engaged elsewhere (e.g. in school) and not running businesses. The remaining 32% were above 45 years of age.

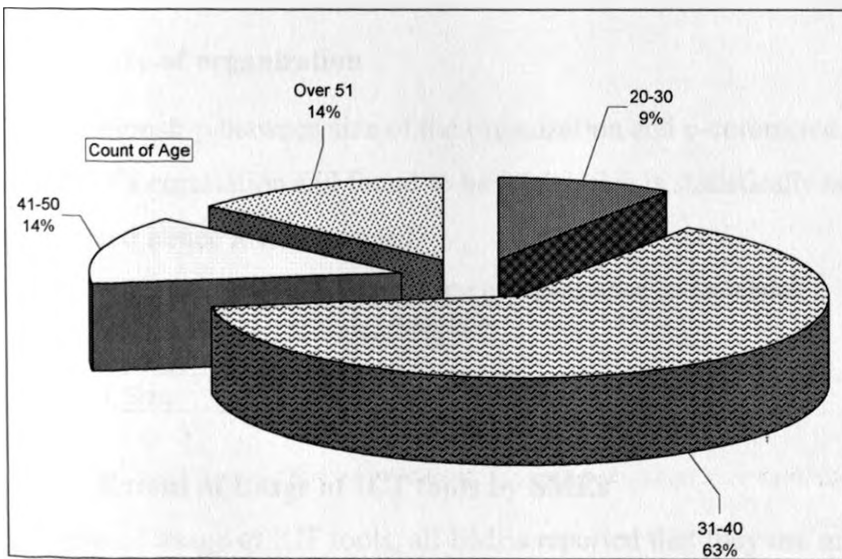


Figure 11: Age of management

Table 5 : Age of management Vs e-commerce adoption

Age bracket (years)	Score
20-30	8.70
31-40	10.64
41-50	9.33
Over 51	8.33

The table above confirms the hypothesis that younger managers of between 31 and 40 years are more receptive to e-commerce than those from upper age brackets.

5.2.7 Age of the organization

Table 6 below indicates that very young SMEs who have been in business between 0 and 5 years are gradually adopting e-commerce. The highest score of 6.8 is recorded for business who have been in existence between 6 and 10 years. However those who have served in business for over 10 years record a quite low score giving an impression that they are either reluctant to change or they have committed their resources in older means of doing business. However, correlation between adoption and age of the organization gave a figure of 0.0456 which is not significant enough. This negates the hypothesis that age of an SME negatively affects e-commerce adoption.

Table 6 : Age of organization Vs e-commerce adoption

Period in business	Score
0 -1 years	3.6
2 – 5 years	4.3
6 – 10 years	6.8
Over 10 years	4.1

5.2.8 Size of organization

The relationship between size of the organization and e-commerce adoption was established by use of a correlation and found to be 0.14 which is statistically not significant enough to be considered hence it was dropped.

Table 7: Correlation between size of organization and adoption

	<i>Adoption</i>
Adoption	1
Size	0.14390081

5.3 Extent of Usage of ICT tools by SMEs

In terms of usage of ICT tools, all SMEs reported that they use mobile phones in conducting business transactions. Additionally all reported using computers although the response was 74% as compared to 95% who constantly used mobile phones. The study also established that fax is slowly being shied away as a communication tool with only 18 % using it as a tool of

trade. This could be attributed to the fact that scanners combined with email are likely to be more cost-effective.

Table 8: Use of ICT tools

Tool	Frequency of use	Percentage
Mobile phone	Always	95%
	Sometimes	5%
	Never	0%
Fixed Phone	Always	36%
	Sometimes	14%
	Never	18%
Fax	Always	9%
	Sometimes	9%
	Never	27%
Computer	Always	73%
	Sometimes	18%
	Never	0%
Radio	Always	14%
	Sometimes	23%
	Never	18%
TV	Always	9%
	Sometimes	14%
	Never	27%

On the type of ownership of the various ICT tools cumulatively, 82% had personal phones while 64% of the firms had company-owned mobile phones. Additionally, 64% had company-owned computers as compared to 45% computers which were personal but used in business. Other tools like fax, television, radio and fixed lines recorded low response. This indicates that mobiles phones and computers are the two most commonly used tools of trade amongst SMEs.

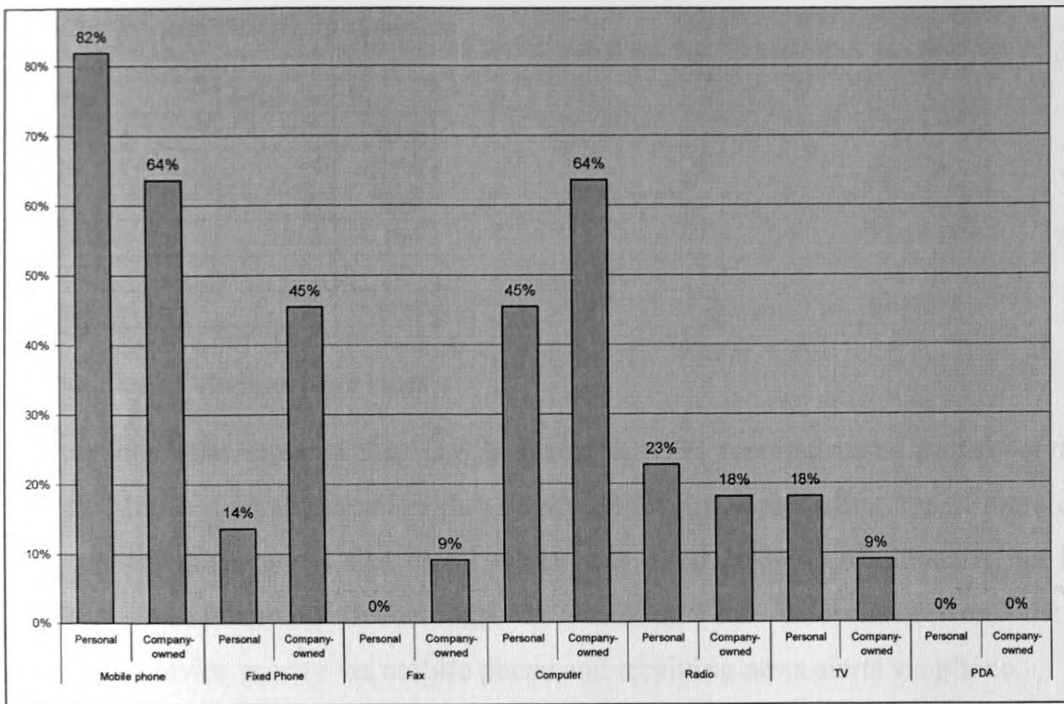


Figure 12: Ownership of ICT tools

5.3.1 Internet service

On the type of internet service the response was an impressive 91% for wireless (e.g radio, Wimax, mobile GPRS/EDGE). It was also encouraging to note that none of the respondents used the old-fashioned leased line. Fibre, which is one of the fastest and most reliable service is used by only 5%. This could be attributed to the fact that installation cost for this service is still very high.

Table 9: Internet service

Internet service	Freq	Percentage
Dial up	4	18%
Leased line	0	0%
ISDN/DSL	3	14%
Wireless	12	55%
Mobile GPRS/EDGE	8	36%
Fibre	1	5%

On the amount of time spent on the internet, 89% reported spending between 2 to 40 hrs monthly while the rest did less than two hours.

5.3.2 Internet budgetary allocation

Results depicted in table 10 below confirm that all SMEs do have a budget line for internet. This underscored the importance attached to use of this service as a means of doing business.

Table 10: Internet Budgetary allocation

Range	Freq	%
less than 5%	7	35%
5-10%	5	25%
11-15%	5	25%
16-20%	0	0%
21-25%	1	5%
more than 25%	2	10%

5.3.3 Use of various e-services

Concerning what services they use in business, 47% reported using postal services a few times which is a good indication that slowly SMEs are appreciating use of more convenient and cost-effective means like email which was rated at 86%. Additionally, an impressive number is embracing technology by looking for information on the internet, sending/receiving money via mobile phone and receiving news alerts via phone.

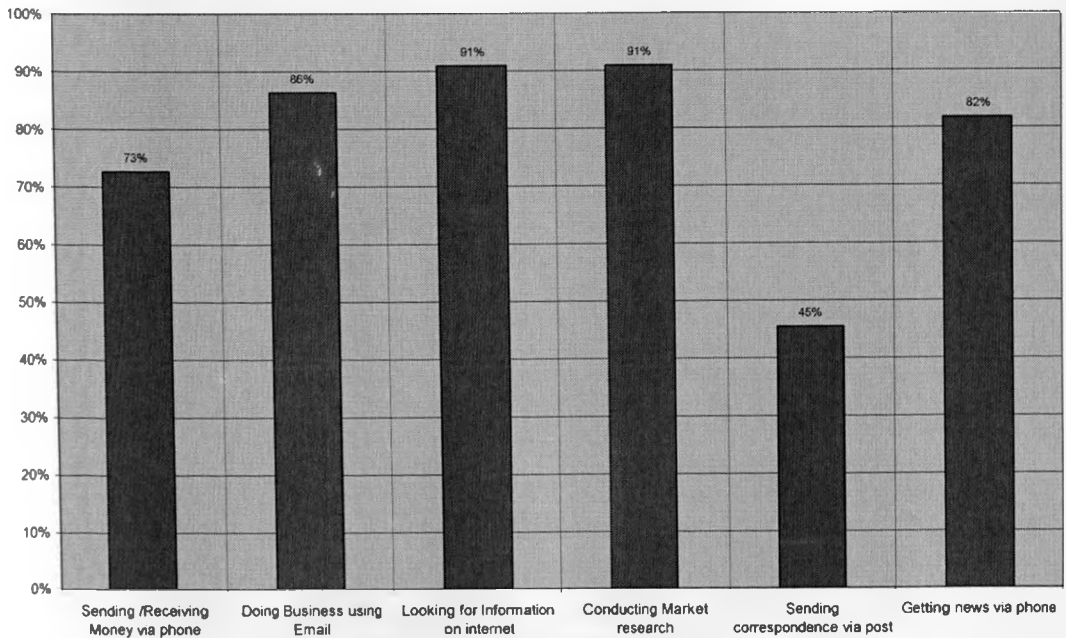


Figure 13: Use of e-services

More specifically, SME use their computers and/or mobile phones to carry out business transactions like contacting suppliers, paying bills but very little on leisure (45%). This demonstrates how SMEs appreciate these tools as being key to their businesses.

Table 11: Appropriateness of Use of ICT tools

	Use of Computer/phone	Percentage
1.	Communicate with Friends	82%
2.	Contact business partners	100%
3.	Pay Bills and other obligations	68%
4.	Get topical news	55%
5.	For entertainment	45%
6.	To Learn	64%
7.	Access other services offered by various institutions & government	73%

5.3.4 Benefits accrued by use of e-commerce

On the advantages enjoyed by use of e-commerce, all of the SMEs indicated having benefited in different ways; ranging from increased market access (at 82%), reduced cost of doing business (68%), increased income (64%), informed decision making due access to information (73%) and job creation (59%). No respondent indicated not having reaped any fruits.

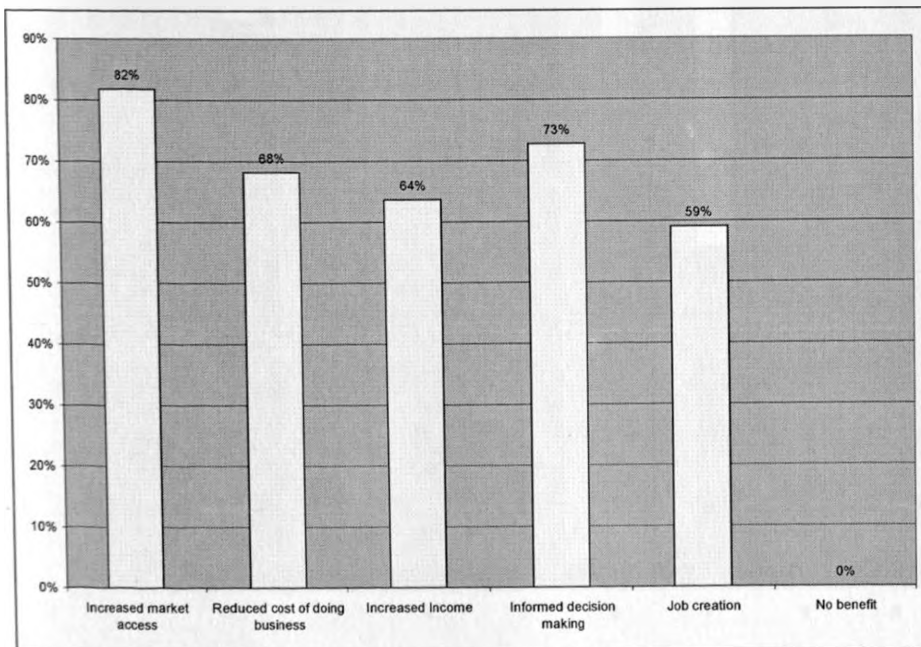


Figure 14: Benefits of e-commerce

5.4 Determinants of e-commerce adoption

The study confirmed that ease of use highly influenced adoption of e-commerce amongst SME with 90% of them indicating having been highly influenced while 10% reported having been influenced to some degree. Combining these two confirms that all SMEs were influenced by *effort expectancy*. The other factors that contributed included maturity of technology, peer organizations (*social influence*), *performance expectancy* recording 92% and *past experience* accounting for 78%.

Unexpectedly almost 81% reported having been highly influenced by state of the art of the technology as compared to 72% who considered maturity of the technology. This is unwise since state of the art does not necessarily guarantee delivery of good service. It will be important for SMEs to always consider maturity to state of the art technology.

On **social influence**, 55% of responded were highly while another 37% were somewhat influenced by their peer organizations putting the cumulative figure at 92%. The government scored the least as an influencing factor in adoption of this technology.

Performance expectancy too plays an influential role in e-commerce adoption recording a high of 92% of all respondents.

Facilitating conditions were taken care of by variables 8 and 9 (in figure 15) which were availability of financial resources and technical skills respectively. Respondents reported 100% on both variables.

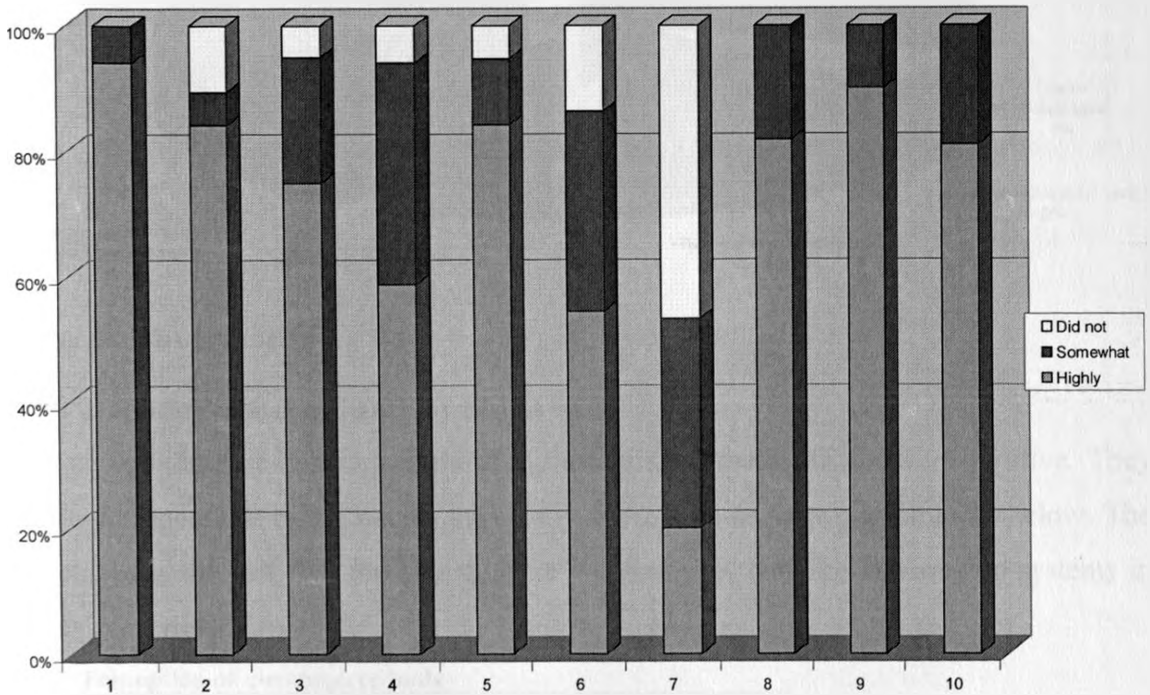


Figure 15: Determinants of e-commerce adoption
Key

1. They are easy to use
2. The technology used is state of the art
3. These tools have been used over time and found good.
4. Peer organizations use them
5. The performance expectation I had for the tool(s)
6. Past experience with the tool
7. The government encouraged me
8. Availability of financial resources
9. There is a good level of technical know-how
10. The management made a deliberate intention to invest in ICT tools

5.5 Hindering factors

One of the objectives of the study was to establish the obstacles of e-commerce adoption. To this end the response confirmed that e-commerce is expensive to most SMEs (24%). Additionally, security, lack of or poor infrastructure came in second and third accounting for 18% and 16% respectively. Undoubtedly, the laying of fibre cable is expected to bring down the cost of bandwidth which is currently the most determining factor in the cost of internet. Perception is a factor too; 11% of the respondents reported perceiving some e-tools as complex for them to consider using them.

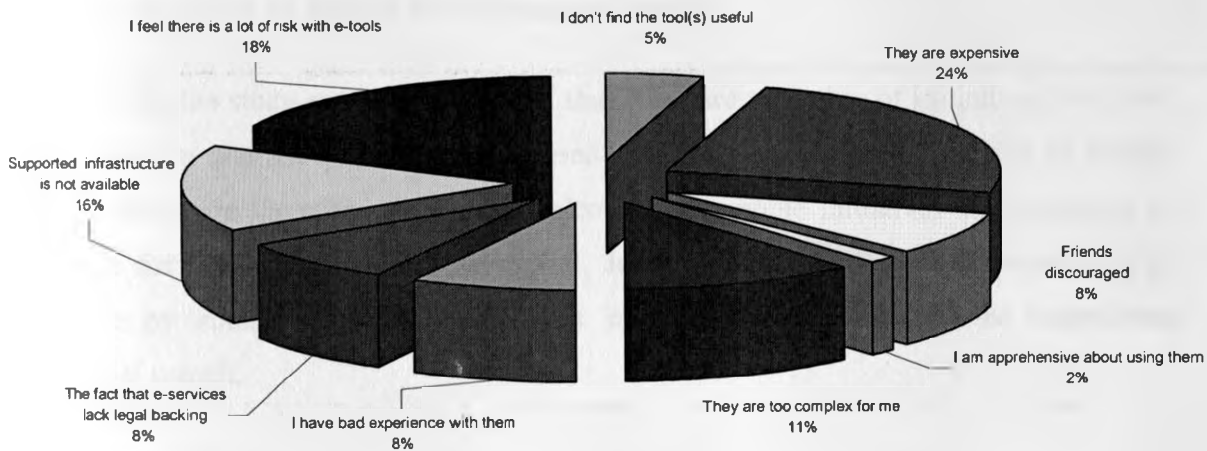


Figure 16: Barriers to e-commerce

5.6 Perception of e-commerce by SMEs

On the perception of e-commerce, the study established that SME are very positive. They look at e-commerce as being key to their daily operations as shown in table 12 below. The most notable is the fact that SMEs recognize e-commerce tools are information systems in day to day activities.

Table 12: Perception on e-commerce tools

	Perception	Score
1.	Help in accessing important business information	88
2.	Assist in accessing buyers/markets	89
3.	Inform about day-to-day activities	89
4.	One learns about what is happening on day-to-day	90
5.	Can reduce poverty	84
6.	Are part and parcel of today's information systems	86
7.	One cannot do without	80
8.	Is the future for business	89

CHAPTER SIX

SUMMARY AND CONCLUSION

6.1 Introduction

The broad objective of the study was to investigate e-commerce adoption by small and medium enterprises in Kenya.

Specific objectives were:

1. To determine the extent of adoption of e-commerce by SMEs
2. To determine critical factors that influence adoption of e-commerce
3. To determine the barriers to e-commerce adoption.

The drive for this study stems from the fact that there are a number of initiatives both from the government and the private sector geared towards promoting e-commerce in Kenya. Business firms are therefore obliged to welcome these noble initiatives by embracing e-commerce for their growth and development. Joseph (2005) affirms the importance of e-commerce by stating that a company that neglects e-commerce may be committing commercial suicide.

6.2 Discussions

From the findings presented in the previous chapter, several conclusions can be drawn in support of the adopted framework. These are discussed below in light of the overall objectives of the study.

Objective 1: Extent of e-commerce adoption by SMEs

From the findings as depicted by table 4 and figure 12, SMEs own and use mobiles phones and computers to conduct business transactions like communication, paying bills and other obligation, doing market research among others. Additionally very few SMEs use their e-tools on non-essential work like playing games and music (table 7). Interestingly, the study established that SMEs are increasingly adopting modern tools and services like email and shelving away aging technologies and/or services like dialup, fax and correspondence by post.

Indeed, e-commerce has so far had a positively impact on those SMEs who have embraced it. This is demonstrated by figure 14 which shows that all SMEs sampled have so far benefited in different ways; 82 % reported having increased market access, 68% reported reduced cost

of doing business, 64% reported increased income while 73% and 59% reported increased access to information and job creation respectively.

Table 6 confirmed that most of the SMEs were committed in using e-commerce by setting aside a budget for internet despite the fact that bandwidth is still very expensive. It is therefore expected that the various fibre cables that have and continue to be laid, more and more enterprises will turn to e-tools as their preferred information systems.

Objective 2: Determinants of technology adoption

The conceptual framework (figure 6) that was adopted in this research grouped determinants of intention to use technology into technological, organizational and environmental.

Technological factors - under technological determinants were variables like maturity, state of the art and ease of use. Surprisingly, figure 15 illustrated that all the three were equally strong determinants. Unlike hypothesis H2a which supposed that SMEs would consider maturity of e-commerce than it being state of the art, the study has established that SMEs give more preference to state of the art than maturity.

Ease of use and performance expectancy heavily influences adoption of e-commerce confirming hypotheses H2b and H2c as depicted on page 30.

Organizational factors – under these were variables like organizational size, age and gender of management. The size and age of the organization were dropped after establishing that the degree to which they influences e-commerce adoption was not statistically significant after scoring 0.14 and 0.07 significance levels for size and period respectively . The age of management however played a role such that SMEs whose management is between 31 and 40 were seen to record the highest score as depicted by table 6. This confirms hypothesis H1c which proposed that young managers are more likely to adopt e-commerce than the old ones. The gender of management too contributed; table 4 shows that female managers were adopting e-commerce far much better than their male counterparts. This disapproves hypothesis H1b which stated that male managers were more likely to adopt e-commerce than female managers. About 80 % of the respondents acknowledged that past experience with an e-commerce tool/service directly affected adoption thereby affirming hypothesis H1c that experience of management affects adoption of e-commerce.

Environmental factors - under these, the study looked at social variables like peer organizations and the government. From these two, figure 15 confirms that the government had the least significance in determining the intention to adopt e-commerce scoring below 50% while peer organization's influence played a significant role reporting a high score of 92%. Collectively however, social influence does play a pivotal role in e-commerce adoption as earlier hypothesized (hypothesis H3a).

Facilitating conditions- availability of finance and technical skills must be in place for adoption of technology to take place. Firms who are financially and technically savvy will more easily adopt technology. This is well confirmed by figure 15.

Objective 3: Barriers to e-commerce adoption

The study noted that SMEs are kept away from exploiting e-commerce for various reasons as depicted by figure 16. Some of the notable ones are that e-commerce is expensive, it is complex, lack of or poor infrastructure and weak legal institution. SMEs own and use mobile phone and/or computers but the cost of connecting and maintaining them online is an impediment. The two factors that directly concern this expense are air-time and bandwidth. While there is concerted efforts to bring down the cost of bandwidth through the TEAMS and Seacom fibre optic cables there appears to be no much effort channelled towards addressing cost of airtime.

Security is another barrier to adoption of e-commerce amongst SMEs. Either perceived or real, the cyber-world appear to pose a lot of uncertainty due to various vulnerabilities.

It is possible that SMEs are not aware of the various and emerging ways of securing their information.

Infrastructure plays a very pivotal role in the adoption and growth of e-commerce and has been reported to be a deterring factor for SMEs. Such infrastructural elements like electricity and roads adversely affect SMEs especially in rural and semi-urban areas and need to be addressed if these firms are expected to tap into the full potential of e-commerce.

6.3 Recommendation

Since the report confirms that there is more use of mobile phones than computers, stakeholders like Ministry of Finance, CCK and mobile service providers should collectively consider lowering the cost of airtime. It is surprising that the cost of mobile handsets has significantly dropped but airtime remains too high to be easily accessed by most Kenyan, SMEs included.

Small and Medium Enterprises while adopting technology they have more preference for aesthetics rather than maturity of that technology. Stakeholders like the government and academic institutions should therefore educate users of any given technology to consider maturity rather than state of the art since the former guarantees good service delivery but not the latter. Additionally, SMEs are more influenced by their peers to adopt e-commerce than the government. To this end, the study recommends that the government should pay more attention to laying the necessarily legal and institutional framework that will foster growth of e-commerce than directly influencing SMEs to adopt e-commerce.

On the high cost of e-commerce, the government through various stakeholders like Ministry of Information and Communication Commission of Kenya (CCK) need to urgently look into ways of reducing the cost of internet especially after the launch of both TEAMS and Seacom last year.

As indicated above, SMEs still fear risks associated with e-commerce. In this regard more aggressive awareness campaigns and training sessions need to be initiated to sensitise SMEs to alleviate their fears. As the Kiswahili saying puts it clearly *He who conceals his/her nakedness cannot bear children*; SMEs must be ready to take the risk and engage in e-commerce the current risks notwithstanding. Moreover the conventional commerce is not without risks and yet life goes on.

Another factor hampering e-commerce adoption is infrastructure. Since energy is key in any e-business, research institutions and academia should endeavour to develop alternative energy sources other than hydro-power upon which most Kenyans rely. Past and recent interventions like charging mobile phones using a bicycle should be deployed in the rural areas so that they add value.

6.4 Conclusion

The study can authoritatively state that SMEs have and continue to adopt e-commerce. This is confirmed by the increased use of mobile phone and/or embracing e-services like mobile money transfer, doing online market research and shying away from more traditional tools like faxes.

Additionally, all SMEs have in one way or the other reaped the fruits of using e-commerce; these include creation of jobs, reduced cost of doing business, more access to information and increased income. The various stakeholders need to continue providing and enabling environment that fosters continued growth of e-commerce.

Lastly, SMEs perceive e-commerce as the future for their businesses

6.5 Limitations of study

The study focused on a small number of SMEs, all of whom were reachable through EPC's offices located in Nairobi, Eldoret and Mombasa. These respondents may have shared characteristics making them not be a truly representative of all SMEs in the country. Additionally, the respondents were mainly from either semi-rural or urban areas hence may have missed out capturing other aspects that affect SMEs in rural areas.

6.6 Areas for further research

This case study looked at selected few SMEs, further comparative studies using other methods like survey may be appropriate if they can cover areas not covered in this study. More interesting is a study that would cover the general e-commerce adoption by all type of businesses. This is likely to give stakeholders like the government a good feel of situation nationally.

It may also be interesting to have a study carried out based on a different model other than the UTUAT used herein. It might unearth other variables which may not have been captured in this model.

REFERENCE

1. Catherine L. Mann (2000). *Electronic commerce in developing countries* (March 2000)
2. Columbus, Louis (2002). *Administrator's Guide to e-commerce*.
3. Daniela Rusu The Challenges of e-Commerce in Central and Eastern Europe (March 2008), University of Iassy
4. Government of Kenya (2004); Development of Micro and Small Enterprises for Wealth and Employment Generation, Sessional paper No 3 of 2004.
5. Government of Kenya (2005); Development of Micro and Small Enterprises for Wealth and Employment Creation for Poverty Reduction, Sessional paper No 2 of 2005.
6. Government of Kenya (2007). *Kenya Vision 2030*.
7. Hoborn. K and Kennedy R., (1999). Private Sector Development Capacity Building for Private Sector Development in Africa; United Nations Industrial Development Organization; Technical Working Papers No. 3.
8. <http://www.cck.go.ke>, accessed on 21st July, 2008
9. <http://www.egovmonitor.com/node/14541>, accessed on 10th November, 2009
10. <http://www.ifc.org/ifcext/sme.nsf/Content/Home>, accessed on 30th July 2008
11. <http://www.internetworldstats.com>, accessed on 2008
12. <http://www.internetworldstats.com/emarketing.htm>, accessed on 21st July, 2008
13. http://www.unctad.org/en/docs/iaosmisc200517_en.pdf, accessed on 24th June 2008
14. International Centre for Economic Growth and KREP (1999); National Micro and Small Enterprise Baseline Survey, Central Bureau of Statistics, KREP Holdings Ltd.
15. Jeferey F. Rayport and Bernard J. Jaworki (2003) *Introduction to e-commerce*, 2nd edition: Tata McGraw-Hill Publishing Company Limited.

16. John E. Anderson and Paul H. Schwager, (2005) SME adoption of wireless LAN technology: applying the UTUAT model, East Carolina University
17. Kinyanjui, Mary and McCormick, Dorothy, (2002). e-Commerce in The Garment Industry In Kenya, Usage, Obstacles and Policies
18. Nadine M. Jacobson, University of Maryland School of Nursing, Baltimore, Maryland , <http://ppn.sagepub.com/cgi/content/abstract/2/1/58>, accessed on 23rd June, 2009
19. Otieno Millicent (2006). An investigation into internet banking technology adoption among commercial banks, University of Nairobi.
20. P.T. Joseph, (2005).S.J *e-Commerce, An Indian Perspective*, 2nd edition,
21. Rogers E.M. (1983); *Diffusion of Innovations*. New York; Free Press
22. Sakari, C (2006). An African perspective on critical success factors for B2B Electronic marketplaces
23. TechNews May 2008, SABA Communications, pages 14-15
24. UNCTAD (2008). Measuring the impact of ICT use in business: the case of manufacturing in Thailand, United Nations Publications, New York and Geneva
25. Venkatesh, V., Morris, M., Davis, G., Davis, F. (2003) User acceptance of information technology: toward a unified view. *MIS Quarterly*, (27)3, pp. 425-478.

APPENDIX

I QUESTIONNAIRE

E-COMMERCE ADOPTION BY SMEs

Contact Information

Name of the organization

Physical Address:

Your name (optional)

Position/Designation

Organizational Information

1. In what sector is your business

- a) Textiles []
- b) Leather []
- c) Handicrafts []
- d) Honey []
- e) Other, specify
..... []

2. Type of area where the company is located:

- a) Urban []
- b) Semi-urban []
- c) Rural []

3. For how long have you been in this business?

- a) 0 – 1 years []
- b) 2– 5 years []
- c) 6 – 10 years []
- d) Over 10 years []

4. How is the gender mix of the management team?

- a) Wholly female []
- b) Mainly female []
- c) 50% female, 50%men []
- d) Mainly male []
- e) Wholly male []

5. Indicate the total number of employees in your company

- a) 1 -10 []
- b) 11-30 []
- c) 31-50 []
- d) 51-100 []

6. What is the general age bracket of the top management of the business

- a) 15 – 19 years []
- b) 20 -30 years []
- c) 31- 40 years []
- d) 41-50 years []
- e) 51-100 years []

ICT Use

7. Which of the following communication tools does the company use and how often (*tick √ as appropriate*)

- a) Mobile phone
- b) Fixed phone
- c) Fax
- d) Computer
- e) Radio
- f) TV

Always	Sometimes	Never

8. Kindly give the number of tools being used in the business in relation to the type of ownership.

Equipment	No. of Units	
	Personal	Company-owned
Mobile phone		
Fixed line		
Fax		
Computer		
Radio		
TV		
PDA		
Other. Specify		

9. Which of the following services does the company use and how often?

- a) Sending/receiving money via phone
- b) Doing business using email
- c) Looking for information on internet
- d) Doing market research on internet
- e) Sending correspondence via post
- f) Getting news items via phone

Always	Sometimes	Never

10. In whose ownership is the tool when you use it (*tick √ as appropriate*)

	Personal	business owned	A friend's	In a cyber cafe
Mobile phone				
Fixed line				
Fax				
Internet				
Computer				
Radio				
TV				
PDA				
Other. specify				

11. What do you use your computer or mobile phone for? (*tick √ all that apply*)

	Always	Sometimes	Never
a) To communicate with friends			
b) To communicate with business partners			
c) To pay bills and other obligations			
d) To get topical news			
e) For entertainment (music, games etc)			
f) To learn			
g) To access services offered by various institutions and government			

12. What benefits do you attribute to the use of ICT in conducting business? (tick \surd all that apply)

- a) Increased market access
- b) Reduced cost of doing business
- c) Income has increased
- d) More informed decision making
- e) A few more job opportunities have been created
- f) No benefit
- g) Other. Specify.....

.....

Internet Availability and affordability

13. What service does the company use for Internet?

- a) Dial up
- b) Leased line
- c) ISDN/DSL
- d) Wireless
- e) Mobile GPRS/EDGE
- f) Fibre

14. How many hours in a month does the company access the Internet?

- a) Less than 4 hours
- b) 5-20 hours
- c) 21-40 hours
- d) More than 40 hours

15. What percentage of computers are connected to the Internet?

- Less than 25% 25-50% 51-75% 76-100%

16. What is the total cost of your Internet access as a percentage of the total expenditure to your company per year?

- Less than 5% 5-10% 11-15% 16-20% 21-25% More than 25%

Facilitating factors for use

17. How do you rate the following factors as having influenced the tool(s) you are using?

	Highly influenced	Somewhat influenced	Did not influence
11. They are easy to use			
12. The technology used is state of the art			
13. These tools have been used over time and found good.			
14. Peer organizations use them			
15. The performance expectation I had for the tool(s)			
16. Past experience with the tool			
17. The government encouraged me			
18. Availability of financial resources			
19. There is a good level of technical know-how			
20. The management made a deliberate intention to invest in ICT tools			
21. Other (please specify)			

18. For the tools you have not used to conduct business, what would be the reasons that have prevented the company from using them?

- a) I don't find the tool(s) useful
- b) They are expensive
- c) I am apprehensive about using them
- d) They are too complex for me
- e) I have bad experience with them
- f) The fact that e-services lack legal backing
- g) Supported infrastructure is not available
- h) I feel there is a lot of risk with e-tools

19. On the whole, what is your take on the use of ICT in day-to-day business activities
[5 – strongly agree, 4 – agree, 3 - neutral , 2 – disagree, 1 – strongly disagree]

	5	4	3	2	1
a) Help in accessing important business information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Assist in accessing buyers/markets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Inform about day-to-day activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) One learns about what is happening on day-to-day	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Can reduce poverty	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Are part and parcel of today's information systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) One cannot do without	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) Is the future for business and everyday life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

20. How do you rate the future of electronic commerce in relation to your business?

	5	4	3	2	1
a) Has no future	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) It will be the driver of business	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) That is where the world is heading	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) It is not clear to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

II SELECTED SME

	SME	Town	Products
1.	Crafts Caravan	Kisii	Bone, wood , soapstone and jewellery
2.	Katchy Collections	Nairobi	Jewelry, sandals, Belts, bags
3.	Iwaly Crafts	Nairobi	Wood carvings, baskets, sandals
4.	Tindi Enterprises	Nairobi	Lampshades, lampstands, gift items
5.	Millennium Handcraft Co-op	Ukunda	General crafts
6.	Joy Bringers	Eldoret	Door mats, wall paintings, bracelets
7.	Sawasawa Brands	Mombasa	Tea
8.	Rad Enterprises	Nairobi	Honey
9.	Mixa Foods & Beverages	Kisumu	Butter & Mechanical tools e.g. peanut butter,
10	Meru Coffee Estates Growers	Meru	Coffee
11	Pearls of Nature		Horticulture
12	Vihiga Mushrooms	Kakamega	Mushroom
13	Western Fishing Flies	Kakamega	Fishing flies
14	Hillside Green	Nairobi	Fruits & Vegetables
15	Smolart	Kisii	Soap stone items
16	Shalom Women Group	Makueni	Sisal Baskets, African Dolls, kikoi shirts
17	Meru Central Coffee Co-operative	Meru	Green/clean coffee
18	Mugama Farmesrs Co-operative	Muranga	Green Coffee
19	Monda African Arts	Nairobi	Jewellery, Soapstone articles, Wooden Utility Items, Basketry
20	Wema Crafts	Nairobi	Pottery, Soapstone, Wood carvings, jewellery and banana fibre products
21	Tender Crop Farm Limited	Nairobi	Horticultural Products, Fishing Flies, Commercial Crafts
22	Saen Limited	Nairobi	Masaai attires, artifacts, sandals

III Summary of Descriptive Statistics

	No of Tools	No of e-service	Adoption	Age	Gender	Employees	Period	Size
Mean	6.227	4.227	5.227	38.182	2	14.545	5.682	23045.455
Standard Error	0.991	0.254	0.568	1.788	0.147	3.572	1.282	5851.902
Median	4.5	5	4.5	35	2	5	2.5	25000
Mode	1	5	3	35	2	5	2.5	750
Standard Deviation	4.649	1.193	2.662	8.387	0.690	16.755	6.015	27447.855
Sample Variance	21.613	1.422	7.089	70.346	0.476	280.736	36.180	75338474.0260
Kurtosis	0.947	3.527	0.873	0.469	2.670	1.351	1.066	0.053
Skewness	0.554	-1.965	0.191	0.905	0.956	1.615	0.925	1.138
Range	15	4	9.5	30	3	50	14.5	74750
Minimum	1	1	1	25	1	5	0.5	250
Maximum	16	5	10.5	55	4	55	15	75000
Sum	137	93	115	840	44	320	125	507000
Count	22	22	22	22	22	22	22	22

IV Correlation between different variables

	Adoption	Annual Turnover Sales	Age	Gender	Employees	Period
Adoption	1					
Annual Turnover Sales	0.1512	1				
Age	0.4672	0.0857	1			
Gender	0.6685	-0.1257	0.0823	1		
Employees	0.5735	0.6120	0.2819	0.1236	1	
Period	0.0456	0.3400	-0.1111	-0.3327	0.0694	1

V LETTER OF INTRODUCTION

Reuben Wanjala
School of Computing and Informatics
University of Nairobi
P.O Box 30297
Nairobi

26 September 2009

Dear Sir/Madam,

RE: COLLECTION OF DATA FROM YOUR ORGANIZATION

I am a postgraduate student at the University of Nairobi, School of Computing and Informatics. As part of the fulfilment of the requirements of the MSC degree, I am undertaking a research project on the adoption of e-commerce by small and medium enterprises.

Your organization falls within the population of interest and this letter is therefore to kindly request you to assist me in collecting data by filling the attached questionnaire.

The information provided will be used solely for academic purposes. Additionally, my supervisor and I assure you that the information you will provide will be treated with strict confidence and a copy of the final report will be availed to you should you need it. Your honest participation will be highly appreciated.

Thank you.

Yours faithfully,

.....
Reuben Wanjala
Student, University of Nairobi