

FACTORS INFLUENCING ICT ADOPTION AND USAGE BY SMALL
AND MEDIUM SIZED ENTERPRISES: THE CASE OF NAIROBI
BASED SMEs

BY
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UNITED STATES INTERNATIONAL UNIVERSITY AFRICA

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STUDENT'S DECLARATION

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

Signed: _____

Date: _____

Andrew Paul Otieno (ID 638585)

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

Signed: _____

Date: _____

Dr. Patrick Kanyi Wamuyu

Signed: _____

Date: _____

Dean, School of Business

DEDICATION

To my father Mr Otieno, mother Mrs Otieno my nephew Micah, brother Brian Ayimba and to my sisters Nelly and Marie. Without whose encouragement it would not have been possible to complete. Thank you for your encouragement, love and care during this involving time.

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ABSTRACT

The purpose of this study was to gain a deeper understanding of the factors that influence the adoption and use of Information Communication Technology (ICT) systems and applications, by Small and Medium sized Companies (SMEs) in Kenya. To achieve this goal the study examined how five factors, namely: perceived usefulness, perceived ease of use, perceived cost of deploying ICT, owner/top management support and employee ICT knowledge and skills, influence the adoption and use of ICT systems and applications by SMEs in Nairobi.

The researcher used descriptive survey to ensure that the research problem was well constructed and understood. The study employed the use of questionnaires to extract pertinent data from participants of the study. The study focused on 250 participants and adopted Random, Convenience and Purposive sampling to establish the sample size that data was collected from.

The study found that perceived usefulness of ICT by companies had a positive effect on its adoption and use by SMEs. SMEs were more likely to adopt ICT solutions when they could easily quantify their benefits to their companies' bottom line, improve productivity and lower their operation cost. The Perceived ease of use of technology was found to have a positive influence on its adoption and use by SMEs based in Nairobi.

The study found that Perceived cost of deploying ICT had a negative effect on ICT adoption and use by SMEs. The study also revealed Owner/Top Management Support of ICT has a positive effect on its adoption and use by SMEs. From the study it was found that, employee ICT knowledge and skills have no significant effect on the adoption and use of ICT by SMEs. This indicates that Kenyan SMEs don't see the significance of their employees ICT knowledge and skills when they are considering adoption of ICT systems and applications.

The study concludes that adoption of ICT by SMEs is influenced by perceived usefulness of ICT systems and applications. The study also established that perceived ease of use of ICT systems and applications enhanced the adoption process by SMEs, and that perceived cost of deploying ICT systems and applications as well as owner and management support, influences the behavior of SMEs on adoption of ICT systems and applications. The study

concluded that Employee ICT knowledge and skill of ICT systems and applications had no influence on adoption of ICT by SMEs, thereby finding that there was no significant relationship between employee knowledge and skills of ICT and adoption of ICT by the SMEs.

The study recommends the management of the companies that sell ICT systems and applications and offer support for these system clearly show the impact of these system on productivity, profitability, improved business processes and communication. Also the companies should clearly demonstrate that the systems are reliable, accessible, available and user friendly. The study also recommends the management of SMEs support ICT initiatives within their companies, this enhances the adoption of ICT by their companies. Furthermore management of SMEs should take into consideration the employees ICT knowledge and skills when they are making decisions on adoption of ICT systems and applications.

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LIST OF ACRONYMS AND ABBREVIATIONS

BDT	Behavioral Decision Theory
CRM	Customer Relationship Management
ERP	Enterprise Resource Planning
GDP	Gross Domestic Product
GOK	Government OF KENYA
ICT	Information Communication Technology
IDT	Information Diffusion Theory
IT	Information Technology
KCSE	Kenya Certificate of Secondary Education
OECD	Organisation for Economic Co-Operation and Development
PEOU	Perceived Ease of Use
PU	Perceived Usefulness
SME	Small and Medium Sized Enterprises
TAM	Technology Acceptance Model
TOE	Technology Organization Environmental Framework
US	United States of America
WEF	World Economic Forum

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Study

The study was initiated out of the author's interest in finding answers that would explain factors that influence the adoption of Information Communication Technology systems and applications, in small and medium sized enterprises operating within Nairobi. Studies have delved into this subject of SMEs adoption of ICT, in developed countries as well as developing countries. A few authors have concluded that enough studies have been done on the subject (Chitura, Mupemhi, Dube and Bolongkikit, 2008), while others have insisted on new perspectives of understanding ICT adoption issues in SMEs (Parker and Castleman, 2007). The benefits of ICT, in particular the Internet, have been well documented, although attaining such benefits has been difficult for many companies throughout the world (Montazemi, 2006).

Information communication technology is defined as digital tool or innovation used to aid in the gathering, processing of data and dissemination of information (Bekinsale and Ram, 2006). ICTs can be viewed as all forms of technologies and product from a wide range of software, hardware, telecommunications and information management systems, applications and devices, and are used to create, produce, analyze, process, package, distribute, retrieve, store and transmit or receive information electronically in a digital form (Porter and Millar, 1985).

Companies today are adopting ICT in all aspects of their businesses, not only improving business processes and task efficiency, but also for improving engagement and communication with their customers (Mutula and Van Brakel, 2007). Governments as well, are adopting ICT to provide better services to their citizenry (Mutula et al., 2007). The adoption of ICT applications and systems by companies needs a business environment that allows for fair competition, security, integration, standardization and the availability of credit facilities for ICT adoption (United Nations Conference on Trade and Development, 2004). Most of the large and international corporate organizations operating in Kenya have effective ICT based systems to efficiently conduct their operations. A number of large organizations

have invested in acquiring computer systems to support their business processes. However, the situation has not been the same with SMEs (Parker and Castelman, 2007).

SMEs are an important component of many economies in the world (Mutula and Van Brakel, 2007). This is due to the contribution they make in creating employment and fostering regional growth and development (Jones, Packham, Beynon and Pickernell, 2011), in turn impacting the economic growth of their respective countries. The development of SMEs is on the development plans of many countries. Advancements in ICT, especially the Internet, have brought about a lot of changes in the way the world economies and markets work, both in developed and developing countries (Montazemi, 2006). Companies in all economies and regardless of size want to expand and increase their market reach, this is easily achieved by utilization of ICT which enables them to communicate with virtually any individual throughout the globe, acquire vital business information and run their organizations more effectively (Montazemi, 2006).

SMEs in Kenya have seen exponential growth and development during recent years and have played a major role in the economic development of the nation (Nyagah, 2013). The sector generates employment opportunities, provides goods and services and steers competition and innovation (Kenya Institute for Public Policy Research and Analysis, 2002). SMEs comprise about 75 % of all businesses, employ 4.6 million people (30%), accounts for 87% of new jobs created and contributes 18.4 % of the GDP (Government of Kenya, 2009). The Kenyan government considers the sector as the centre of industrial development and has hinged several development strategies on it (GOK, 2007). However the sector faces binding challenges that make it impractical for it to realize its full potential and meet the government's expectations. These include limited market access, limited access to information, finances, technology and unfavorable policy and regulatory environment among others (GOK, 2005).

In spite of their roles in terms of contribution to exports, employment and economic development in Kenya, SMEs face many challenges that hinder growth and development compared to their larger counterparts. Nyagah (2013) identified several challenges facing Kenyan SMEs, such as; limited access to resources from financial institutions, human capital constraints, high level of international competition due to globalization, competition from

Multinational Companies and limited access to technology.

The development of ICT such as the fiber network infrastructure, various business applications, open source applications and SaaS provides enormous opportunities for small businesses to conduct their business activities online. According to the Organisation for Economic Co-operation and Development (2003), ICT has the potential to enhance communication within a company, leading to efficient resource management. Additionally, ICT applications such as Enterprise Resource Planning (ERP) provide businesses with a viable source to store, share, and utilize acquired business knowledge and know-how (OECD, 2003).

Recent studies have examined the effects of ICT investment on economic performance in varying regions throughout the world. One recent study, Socio-economic Impact of Internet in Emerging and Developing Economies (Telenor Group, 2012), estimates that when Internet penetration rises by 10 % in emerging economies, it correlates with an incremental GDP increase of 1% to 2 %. Similarly, another study found that the comparative GDP growth rate of a developing country can be boosted by 0.59 % per annum for every 10 mobile telephones added per 100 inhabitants (World Economic Forum, 2009). ICT is now known to be catalyst of productivity and growth in developing nations. Leonard Waverman, Dean Haskayne School of Business, posits that ICT must be used to fuel the global recovery since it's the key infrastructure of the 21st Century (WEF, 2009).

Earlier studies on Kenyan SMEs have focused mainly on levels of ICT usage, perceptions about ICT and ICT adoption readiness. A review of related literature reveals that little attention has been given to research into the factors that influence ICT adoption among SMEs. Hence, there is a need to conduct further empirical research to better understand the challenges confronting Kenyan SMEs that hinder the adoption and use of ICT. By identifying these factors, the relevant authorities may be in a more informed position when developing future policies that better supports and enables SMEs to adopt and leverage on the benefits that ICT presents. To this end, the current study seeks to develop an understanding of the major factors and challenges facing Kenyan SMEs that inhibit adoption and use of ICT as a starting point for making decisions on how stakeholders can help SMEs leverage ICT and help government in policy making.

Adopting ICT systems and applications has not been easy for many SMEs across the world (Jones et al., 2011), mostly due to the changing field of information systems development and the varying needs of local and global business in general. Previous studies of ICT adoption report that SMEs in developing countries generally have not fully utilized the power of the Internet to expand their business beyond their regions (Bai, Law and Wen, 2008) except in the use of simple communication tools such as emails (Mpofu and Mathys, 2011). The influencing factors that may hinder or stimulate adoption of ICT include but are not limited to; cost of acquiring and operating ICT, lack of ICT knowledge by employees and managers, owner/manager low literacy levels, inability to perceive ICT benefits, unfriendly regulatory policy and requirements and cultural issues. This study aims to advance the understanding of ICT adoption from inside the organization, to unearth the social-technical issues that can explain the SME ICT adoption or non-adoption.

Theories and frameworks have been employed in previous studies to advance research and practice of ICT adoption in SMEs (Mahmud and Ismail, 2010), (Parker and Castleman, 2009). Some of these are theories and frameworks are Theory of Planned Behaviour (Ajzen, 1991). Technology Acceptance Model (Davis, 1986), Technology Organization-Environment Model (Tornatzky and Fleischer, 1990), Diffusion of Innovation Theory (Rogers, 1962). Some of these theoretical frameworks have been explained in the literature review, although it suffices to mention here that most of the studies that have applied theoretical frameworks have involved developed country nations (Sharma, 2003).

1.2 Problem Statement

There has been discourse between researchers in academia about the value of ICT to SMEs despite support of the significance of ICT adoption and use (Parker and Castleman, 2007). Previous studies on ICT adoption report that SMEs in developing countries such as Kenya, have not fully capitalized on technological developments to expand their businesses beyond their traditional markets (Shemi and Procter, 2013). There is a need for a better understanding of the determinants of ICT usage (Taylor and Todd, 1995) and factors that drive or constraint its adoption and use. ICT plays an integral role in the current global economy and it is vital for SMEs in Kenya to adopt ICT in order to grow and develop and be

able to remain competitive in the global economy (Nyagah, 2013). It is therefore the aim of this study to assess the factors that influence the adoption and use of ICT in SMEs based in Nairobi.

Many researchers such as Mutula and van Brakel (2007) and Ngwenyama and Morawczynski (2009) have undertaken studies around the factors that influence adoption of ICT by SMEs in the developed world. However, few studies have been performed to understand impact of internal factors such as perceived usefulness, ease of use and cost of deployment on adoption behaviors of SMEs in the developing world and particularly Kenya. This research study, therefore, aimed at reducing this knowledge gap. More specifically, this study attempted to establish the effect of factors that influence the adoption of ICTs by focusing on five factors: perceived usefulness of ICT, perceived ease of use of ICT, Perceived Cost of Deploying ICT, Owner/Top Management Support of ICT and Employee's ICT Knowledge and Skill of ICT.

Furthermore, the findings of the study provides company managers with valuable insights into factors that influence adoption if ICT, this will help them make informed decisions on how to improve ICT adoption and use within their companies. The benefits of ICT adoption and use by small and medium sized enterprises range from increased opportunity to expand and market access to operational efficiencies and making enterprises more competitive and successful (Sarosa and Zowghi 2003).

1.3 Purpose of the study

The purpose of this study was to identify the factors that influence the adoption of Information and Communication technology ICT among SMEs operating in Nairobi and its environs.

1.4 Research Question

The researcher embarked on the study to find answers to the questions stated below:

1.4.1 Does Perceived Usefulness of ICT have a positive effect on its adoption and use by SMEs?

1.4.2 Does Perceived Ease of use of ICT have a positive effect on its adoption and use by

SMEs?

1.4.3 Does Perceived Cost of Deploying ICT have a positive effect on its adoption and use by SMEs?

1.4.4 Does Owner/Top Management Support of ICT have a positive effect on its adoption and use by SMEs?

1.4.5 Does Employee ICT knowledge and skill have a positive effect on its adoption and use by SMEs?

1.5 Significance of the Study

1.5.1 Business Managers

This study may assist owners and managers of SMEs to assess their ICT systems adoption initiative as well as to identify measures for the successful adoption of ICT systems and applications. Such measures could help managers not only to allocate resources as they develop their ICT strategy, but also to evaluate impact on profitability. Thus, in order to maximize the likelihood of success of such systems the managers may consider focusing on those success factors identified in this study.

1.5.2 Researchers and Academicians

In addition, the study addresses the gaping need for scholarly studies in the emerging economies and in particular Kenya, on the factors that affect adoption of ICT in small and medium enterprises. This study aids in further demonstration of the importance of ICT adoption by SMEs and the impact it has on the performance and growth of the SME sector in Kenya.

1.6 Scope of the Study

The study was restricted to SMEs within Nairobi. The area was selected due to proximity to the researcher and for convenience. Data was collected from the respondents in January and February of 2015. The study surveyed owners and employees in decision making positions of SMEs through the use of questionnaires. A limitation that was faced in the course of this

study was the lack of cooperation from the participants. This challenge was mitigated by acquiring advance clearance from the relevant personnel in management positions within the participating companies to ensure success of the research. Anonymity of the participants was assured through a signed introductory letter attached to the questionnaires that were used to collect data from participants.

1.7 Definition of Terms

1.7.1 Customer Relationship Management

CRM refers to the practices, strategies and technologies that companies use to manage, record and evaluate customer interactions in order to drive sales growth by deepening and enriching relationships with their customer bases (Rouse, 2013).

1.7.2 Enterprise Resource Planning

ERPs are business process management software's that allows an organization to use a system of integrated applications to manage the business and automate many back office functions related to technology, services and human resources (Beal, 2014).

1.7.3 Information Communication Technology

ICT is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning (Rouse, 2013).

1.7.4 Technology Acceptance Model

TAM a theory that describes various factors that have a positive or negative effect on the adoption or use of a given technology. When an individual is presented with a given technology there are factors that influence their behavior and perception towards the technology (Davis, 1986).

1.7.5 Technology organization environmental framework

TOE is a theoretical framework that identifies the features of technology, the organizational readiness of the firm, and the environmental conditions as key drivers of technology adoption (Thornatzky and Fleischer, 1990).

1.8 Chapter Summary

This chapter provided an over view of the research area and identifies the problem of the study. It also presents the background of the study and the beneficiaries of the results of the study. It focuses on the possible factors that affect adoption of ICT in regards to SMEs. Chapter two provides published material that helps to define the problem and purpose as specified in the research questions.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter focuses on a discussion of the literary works of various scholars investigating the factors that influence the adoption of ICT systems and applications in regards to Small and medium sized enterprises. The literature will be reviewed to identify the shortfalls in the existing literature that can be tackled during the course of this research study, primarily using the results from the primary research and addressing the problems. Furthermore the shortfalls identified during the literature review will also be highlighted in the last chapter which could aid other researchers to select the topics for their research.

2.2 Perceived usefulness of ICT on Adoption by SMEs

Perceived usefulness defines user's perception that using a specific application improves output and processes (Lu, Yu, Liu, and Yao, 2003). It provides insight into how actual use and intention to use are influenced (Lu et al., 2003). The concept of perceived usefulness is based on the theoretical model that includes the theory of self-efficacy (Bandura, 1982), the theory of behavioral decision (Beach and Mitchell, 1978), the theory of expectations, the theory of the diffusion of innovations (Torknatzky and Fleischer, 1990), the theory of reasoned action (Ajzen and Fishbein, 1980) and the theory of planned behavior (Ajzen, 1999). The theory of self-efficacy (Bandura, 1982) posits that individual behavior is influenced by the beliefs of expected result of chosen behavior. The concept of perceived usefulness is the equivalent of the beliefs in the theory of self-efficacy, expected as a result of the behavior of adoption and use of ICTs.

The behavioral decision theory (Beach and Mitchell, 1978) posits the fact, that the choice a person makes between several decision-making options is influenced both by the effort required to implement an option and by the utility of the perceived decision resulting from this process. This utility determines the choice of the person and therefore joins the concept of the perceived usefulness. The theory of diffusion of innovations (Torknatzky and Fleischer, 1990) focused on the relationship between the characteristics of innovation and its

adoption, and concludes that the adoption of technology depends on the relative advantage acquired through the adoption of the technology, a concept that is also related to the concept of the perceived usefulness of a technology. In the same perspective, marketing research conducted by Hausser and Simmie (1981), shows that the perceived effectiveness of ICT determines the choice of adopting or rejecting their use, a similarity between the concepts of perceived effectiveness and that of perceived usefulness. Finally, the concept of perceived usefulness as defined in the Technology Acceptance Model of Davis (1989) where the behavior is influenced, according to the perceived usefulness of the technology.

Perceived usefulness is also seen as the improvement in performance that an individual believes he can acquire when using a technology. The usefulness of the technology is related to the perception of the person who uses it in performing his or her work (Davis, 1993). It is in this view that Davis (1986) defined it as the percentage of performance improvement expected from using the system and assessed through six indicators that actually represent the expected benefits of using the technology, namely: the speed in performing given tasks, the improvement in work performance, the improvement in productivity, the improvement in efficiency at work, the improvement in business process at work and the usefulness of technologies in the work environment. Consequently, we define the perceived usefulness of ICT as the level of an individual's conviction that the use of ICT will drastically improve the individual performance at work (Hausser and Simmie, 1981).

several studies have shown that the adoption of desktops and laptops, the use of e-mails (Limayem and Loukil, 1997), the increase in online business (Limayem et al., 1997) and the adoption of web applications (Chang and Cheung, 2001) depend on their perceived usefulness by users before they adopt them. According to the theory of diffusion of innovations (Rogers, 1995), the diffusion cycle of ICT within a population depends on the factors stated earlier in the literature review, including their relative advantage, which means that the individual perceives the new technology as better than the one that its replaced (Davis, 1986).

Indeed, the acceptance of ICT is influenced by the perception of their potential users. The more they are convinced that their use is improving their performance, the more they adopt and incorporate them in their work. This theory of the positive impact of perceived

usefulness of ICT on their use has been verified in many studies (Bukhari, 2008), confirming that perceived usefulness is a determinant of adoption and use of technologies, that the pre-adoption attitude of users is based on the perceptions of the utility of the technology, and that more than sixty percent of the explanatory power of the technology acceptance model is due to perceived usefulness (Venkatesh and Davis, 2000). More recently, King and Marks (2008) showed that the use and adoption of knowledge management systems was feasible only if their users perceive them as useful. Based on this analysis, it is clear that perceived usefulness has a positive effect on adoption behavior of companies in regards to ICT. This allows us to conclude that perceived usefulness of ICT has a positive influence on the adoption and use of ICTs.

Technology acceptance model was derived from Ajzen and Fishbein (1980), theory of reasoned action in respect to user acceptance of technology, substituting the theory of reasonable action with two main factors namely: perceived ease of use and perceived usefulness. It argues that user acceptance of technology is strongly affected by perceived usefulness (Davis, 1989). Davis (1989) also reported that perceived ease of use has direct influence on perceived usefulness of ICT to users. Further studies by Davis (1989) show that there exists external factors that influence both perceived ease of use and perceived usefulness in regards to ICT adoption and use.

2.2.1 Theory of Self efficacy on Perceived usefulness

Theory of self-efficacy is based on the beliefs that an individual can control their own motivation, behavior and environment (Bandura, 1982) it is also seen as one of the major influencers of adoption of technology by an individual. Users who consider ICT systems to complicated and believe that they won't be able to use them in their activities usually avoid adopting ICT systems (Ajzen, 1999). Hausser and Simmie (1981) in their research also found that self-efficacy is an influential factor, which determines individual motivation and effort persistence by an individual. The connection between self-efficacy and perceived usefulness is meant to present the effects of self-efficacy on the motivation of the user in adopting ICT and perceiving its usefulness (Hausser et al., 1981). This shows that employees, managers and owners of SMEs with high self-efficacy will perceive ICT to be easy and useful due to the effect of self-efficacy on the degree of effort, the persistence and the level of learning

which takes place in the adoption process and they will show less resistant to changes (Lu et al., 2003). Therefore, self-efficacy will affect the use of ICT through perceived usefulness of the technology by the users (Limayem and Loukili, 1997).

2.2.1.1 Factors influencing Self efficacy

Bandura (1982) in his research identified several factors of self-efficacy, including skill mastery and verbal persuasion. From previous ICT research, these factors are manifested as past experience and support of the system (Limayem et al., 1997). ICT knowledge and skill has been shown to affect self-efficacy expectations positively with successfully completing a task using technology raising skill levels and failures lowering them. Limayem et al. (1997) in their research found that experience is a very influential factor due to its direct, individual nature.

Research has also found that verbal persuasion positively affects self-efficacy, where encouragement and support from others raises efficacy expectations in individuals (Chang and Cheung, 2001). Chang et al. (2001) also showed that self-efficacy expectations delivered through verbal persuasion are likely to be less effective than those acquired based on personal experience. The ineffectiveness of verbal persuasion on self-efficacy is down to the fact that verbal persuasion doesn't leave an impression on an individual as personal experience (Chang et al., 2001).

This is consistent with the technology acceptance model, where these factors are rated as external factors affecting perceived usefulness (Venkatesh and Davis, 2000). ICT knowledge and skill has been found to be connected with self-efficacy and perceived usefulness, Chang and Cheung (2001) discovered that ICT skills experience is likely to improve an individual's perceptions and beliefs about using ICT by increasing their beliefs in their ability to overcome the learning curve and to reduce any fears that adoption of ICT may bring (Venkatesh et al., 2000). Thus, experience is hypothesized to have an indirect effect on ICT usage and adoption through self-efficacy and perceived usefulness (Venkatesh et al., 2000).

2.2.2 Innovation Diffusion Theory on Perceived Usefulness

Diffusion is the activity of disseminating information about a new technology through a given communication channel in order to inform a population about the new technology (Rogers, 1995). Therefore, the innovation diffusion theory argues that a user makes the decision to adopt a technology as a result of the information they have received about the technology (Babbie and Benaquisto, 2009). According to Rogers (1995), IDT is made up of five characteristics.

Relative advantage is the level to which a new technology is seen to be better than the technology it's replacing. This factor is found to be one of the best predictors of the adoption of an innovation (Babbie and Benaquisto, 2009). Compatibility defines the degree to which a technology is viewed as being consistent with the potential users existing values, past experiences, and requirements (Babbie et al., 2009). Observability is the extent to which the results of a technology can be seen by its users and other individuals (Babbie et al., 2009). Trial-ability defines the level to which technology can be tried and tested in a given environment (Babbie et al., 2009). Complexity is the perceived level of difficulty by the user of the technology in understanding the technology and its ease of use (Chang et al., 2001). These characteristics are used to explain why an individual would adopt a technology and the decision making process. Chang et al. (2001) found that the relative advantage factor in IDT is similar to the notion of the perceived usefulness in TAM.

Additionally, in terms of the complexity factor, TAM and IDT propose that the formation of an individual's intention to use a technology is partially determined by how difficult the technology is to understand or use (Rogers, 1995). In other words, the less complex something is to use, the more likely an individual is to accept it. Compatibility is linked with the fit of a technology with prior experiences, while the ability to try and observe are associated with the availability of opportunities for relevant experiences (Lu et al., 2003). These factors relate to prior technology experience or opportunities for experiencing the technology under consideration. After the initial adoption, the effects of these three factors could be diminished with continuous experience by the users (Chang et al., 2001).

2.3 Perceived ease of use of ICT on Adoption by SMEs

Perceived ease of use measures the prospective user's assessment of the effort required to utilize ICT systems and applications (Davis, 1993). Mental effortlessness demanded by users of ICT applications influence the intention to adopt and use ICTs thus, applications and systems that are perceived to be complex and that have steep learning curve are thought risky to adopt (Opia, 2008). Perceived ease of use is an independent and fundamental construct to perceived usefulness, it impacts on near term usefulness since improvement on it contributes positively to outcomes, and ultimately defines perceived usefulness (Chau, 1996). Studies undertaken by researchers to record observed usefulness and ease of use trade off and to determine the impacts of external factors on these two determinants of adoption show mixed findings (Chau, 1996), (Davis, 1993). Nevertheless, empirical findings confirm the positive relationships between ease of use and attitude towards use (Venkatesh and Davis, 2000) and show that ease of use is a proven key determinant of users' intention to accept ICT (Venkatesh et al., 2000).

Research on factors that contribute to perceived ease of use which is a factor that influences adoption behavior of individuals and organizations in regards to ICT adoption, found that control over the technology, motivation to use and emotion towards the technology are proposed as general building blocks in the formation of perceived ease of use in regards to a new technology (Ajzen and Fishbein, 1980). Control over technology is divided into ICT self-efficacy and perceptions of external control, motivation to use ICT are seen as computer playfulness, and emotion towards ICT is viewed as computer anxiety (Bandura, 1982). ICT self-efficacy, perception of external control, computer playfulness, and computer anxiety are factors that are independent from the technology and play an important role on the perceived ease of use of ICT (Lu et al., 2003). As the user gets more familiar with the technology, objective usability, perceptions of external control and perceived enjoyment from continued use of the new technology will increase, thus positively increase the influence of perceived ease of use on ICT system adoption and use (Lu et al., 2003).

2.3.1 ICT Self-Efficacy and External Control on Perceived Ease of Use

According to Ajzen (1985) Self-efficacy and control defines the perception of an individual that they possess the knowledge, the opportunity and resources to perform a given activity. Perception of control is the building blocks to the Theory of Reasoned Action (Ajzen and Fishbein, 1980) and in turn through TRA the Theory of Planned Behavior was developed (Ajzen, 1985). Given that Technology acceptance model was developed from the theory of reasoned action, the role of control was not fully explored in the development of TAM. Previous studies also, have not clearly examined the role of control in regards to TAM (Venkatesh and Davis, 1996).

Research has shown that control has a key role to play in various factors that influence adoption of technology such as intention and behavior (Ajzen, 1999). Other studies by Taylor and Todd (1995) resulted in the same conclusion. However, the impact of control on intention over and above what is explained by the Technology acceptance model of perceived ease of use and perceived usefulness are unclear (Venkatesh and Davis, 1996). Another point of view in Information technology research, reveals that perceived ease of use is seen to be a determinant of attitude and behavior which is consistent with perceived behavioral control (Taylor et al., 1995), while internal and external control have been linked to perceived behavioral control in TPB, the current work relates control to perceived ease of use, thus departing from the basic framework of TPB. However, such effects have been seen in past studies (Venkatesh et al., 1996).

Past ICT research has viewed control as a multi-dimensional factor, that include self-efficacy, technology facilitating conditions, and resource facilitating conditions (Taylor and Todd 1995), the multi-dimensionality of control as an influential factor has, been brought into question especially in studies of a more social nature. Azjen's (1985) view of control refers to internal and external factors that may constrain the influence of perceived ease of use, in detail this refers to internal control in terms of knowledge of control and external control in terms of perceived control on one's environment (Azjen, 1985).

Researchers of information systems adoption have defined control as ICT self-efficacy, this is a user's belief their ability to perform a given function using an ICT technology (Caldeira

and ward, 2002). There is empirical evidence supporting the flow from individual ICT self-efficacy to ICT system perceived ease of use (Venkatesh et al., 1996). According to Caldeira et al. (2002) the connection is justified by researchers with the argument that, since there will be a lack of knowledge about a new system, the individuals confidence in their ability to learn will determine whether they will perceive the system as easy to use.

While there has been some support for the influence of perceptions of internal control which referees to self-efficacy on perceived ease of use of ICT system, the role of perceptions of external control in determining perceived ease of use has not been extensively researched on. As Clarke (2000) stated, external control issues are not explicitly included in technology acceptance model, or the perceived ease of use factor. Clarke (2000) argued that while perceived ease of use could integrate control over resources, this wasn't clearly defined. Given the broad theoretical framework of perceived ease of use, Clarke (2000) expects that individual's perception of difficulty of using the new system will consider both internal and external factors of control. For instance in the case of workplace ICT support, specific issues related to external control include the availability of ICT support employees, employees who the companies employ to help users when they face barriers and difficulties in the use of ICT systems, especially during the beginning phases of ICT use (Beckinsale and Ram, 1990).

ICT users in companies will develop generic perceptions of external control based on prior ICT systems adopted by the organization. Prior to direct experience with the new system environment, such general perceptions of external control are essentially independent of the technology and serve as situational factors in the development of perceived ease of use of the new system (Beckinsale and Ram, 1990).

2.3.2 ICT Computer Playfulness on Perceived Ease of Use

ICT computer playfulness relates to perceptions of satisfaction from performing an activity with the use of technology (Venkatesh et al., 2000). In relating ICT playfulness to general computer usage in organizations, the factor of computer playfulness has been successfully applied and implemented in previous studies (Venkatesh et al., 2000). Computer playfulness is an individual factor that describes the degree of satisfaction an individual gets from the use of ICT (Venkatesh et al., 2000). There is a significant body of research that provides

evidence regarding the influence of the role of computer playfulness on technology use in the organizations (Venkatesh et al., 2000, Opia, 2008). Although TAM predicts technology acceptance based on user perceptions following such interactions, research to date has not studied how computer playfulness fits into the technology acceptance model framework (Opia, 2008).

Computer playfulness is an individual influencing factor that is independent of the system that is being implemented (Davis, 1993). Individuals who are more comfortable with computer technologies as a tool of enjoyment in general are expected to easily adapt to new system just for the sake of using it, rather than the intrinsic benefits of using the new system (Davis, 1993). Individuals who find enjoyment from using computers may not view the difficulty of learning to use new system, in turn individuals who don't find enjoyment from use of computers may be more susceptible to the difficulty of the new system thus impending ICT adoption (Davis, 1993). This implies that there is likely to be a positive relationship between general computer enjoyment and perceived ease of use. Computer playfulness may also include challenge and curiosity (Opia, 2008). Thus, individuals who enjoy using technology may rate adoption of new system as easy compared to individuals who don't.

2.3.3 Computer Anxiety on Perceived Ease of Use

Computer anxiety is defined as the users fear or hesitation when faced with the possibility of using a computer to perform a task (Bandura, 1982). Computer anxiety, as computer self-efficacy and computer playfulness, is defined by an individual's general perceptions about ICT usage (Lu et al., 2003). Research has shown that computer anxiety is a non-positive reaction to the use of technology. Research in ICT usage has brought to life the importance of this factor and shown its influence on perceived ease of use (Hausser and Simmie, 1981). In some studies computer anxiety has been shown to have a significant influence on attitudes towards ICT, intention, behavior, learning, and performance (Hausser et al., 1981).

Prior research has concentrated on the causes of the anxiety towards ICT usage due to its importance as an influencing factor (Torknatzky and Fleischer, 1990), and ways to reduce computer anxiety (Torknatzky et al., 1990). From a pragmatic standpoint, with the increasing use of computers in the workplace and homes, there may be some question about whether the

computer anxiety, which was of much significance in the past when individuals in organizations showed this emotion is still applicable today (Chang and Cheung, 2001).

The Literature has led us to conclude that computer anxiety is an influential factor that negatively impacts the perceived ease of use of ICT systems. In related research, Rogers (1995), suggest that there are two key components of anxiety, cognitive and emotional. The cognitive factor leads to negative expectancies while the emotional factor leads to negative physiological reactions. Hausser et al. (1981) argued that even though anxiety is an affective state, its effects on behavior and performance are mediated by cognitive processes.

2.4 Perceived Cost of Deploying ICT on Adoption by SMEs

Extant research has proven that Cost related to deployment of ICT system is a factor that influences SMEs behaviour of adoption. (Ernst and Young, 2001). The cost factor of ICT adoption has been studied by various ICT based researchers (Seyal and Rahim, 2006), (Drury and Farhoomad, 1996), (Cox and Ghoneim, 1996) who have found a significant relationship between cost and adoption of technology. SMEs are more likely to adopt ICT systems that are perceived to have lower financial implications than those that do in other words, SMEs are less likely to adopt ICTs when their initial deployment costs are high (Dixon, Thompson and McAllister, 2002). Also research conducted by Poon and Swatman (1999) found that SMEs often have challenges in acquiring finances to invest in ICT as they may have more pressing managerial commitments, and do not see the immediate need to invest. Also due to the scarce nature of capital SMEs may find it hard to justify the need to spend money on ICT infrastructure and systems (Reynold, Savage and Williams, 1994). Tidd, Bessant and Pavitt (1997), research also revealed that SMEs challenges in the formation of ICT policies and strategies, due to the lack of expert knowledge and skills brought by specialized staff, which most companies find too costly to engage with.

The apparent lack of financial resources in small firms and their resistance to invest in ICT systems and applications has been reported as major barriers in some studies (Reynolds et al., 1994). Studies have also shown that small firms do encounter difficulties with respect to obtaining finance, and this unfavorable situation often set back their efforts to adopt needed ICT systems and applications (Chapman, James-Moore, Szczygiel, and Thompson, 2000).

Tan and Wu (2003) showed that financial matters are vitally important to owners and managers and such issues often influence the adoption of ICT in SMEs. Prior research has shown that a lack of financial resources is one of the predominant characteristics setting smaller businesses apart from larger businesses (Thong, 1996). In this study the author wanted to establish whether perceived cost of adoption of ICT was a factor that influenced the adoption and use of ICT by the Nairobi based SMEs.

2.4.1 Total Cost of Ownership

Total Cost of Ownership (TCO) is a concept used to determine the entire cost of implementing and maintenance associated with ownership of an ICT asset (Seyal and Rahim, 2006). Reducing the cost of ownership of ICT assets will result in higher rate of ICT adoption and use. According to the Tan and Wu (2003), enterprises collectively spend millions of dollars annually on ICT systems and platforms. As competition grows so does the need to capitalize on the competitive advantage derived from employing ICT. Research has shown that the factors that influence the costs of adoption and maintenance of ICT systems are more complicated than just the cost of purchasing hardware, they incorporate both tangible and intangible factors (Reynold, Savage and Williams, 1994).

2.4.1.1 Tangible Costs of Ownership

Tangible costs of ownership provide the most accessible basis for comparing ICT systems and infrastructure that an organization is looking to adopt and use (Reynold et al., 1994). The cost of purchasing ICT equipment, can only serve a basis to determine what entire cost of ownership will be. Only after both the tangible and intangible costs have been considered can an organization know the total cost of ICT system implementation. (Reynold et al., 1994).

2.4.1.1.1 Purchase Price of ICT hardware

According to Tidd et al. (1997) Comparing different ICT systems can often be a difficult exercise for many companies and for various reasons. The level of standardization that a hardware component has directly affects its costs of acquisition, as well as the cost of the components that are used with the hardware such disks, memory, network user interfaces and

backup systems (Tidd et al., 1997). At the core of the evaluation, performance against cost needs to be considered. Only by comparing systems that are similar, performance indicate the actual value of the equipment. Less expensive systems that lack required performance to handle tasks don't give organizations value for their money. ICT hardware capable of output at high performance but are overpriced due to their capabilities will not add value to the company and thus increase cost of ownership (Tidd et al., 1997).

2.4.1.1.2 Service and Support Costs

According to Chapman et al. (2000) costs regarding service and support can be viewed in various ways. The level of complexity of ICT systems and infrastructure affects the cost of support. Recurring operations, which are covered in support agreements, is another cost that can be quantified easily. Some system implementations have higher setup and operating costs than others systems (Chapman et al., 2000). ICT applications and systems that are setup in a way that they need manual upgrading, on users devices such as PCs and mobile devices usually tend to have higher support cost than Web-based applications and systems. Applications that are developed to use network infrastructure such as, Web services, or browser-based interfaces are easier to upgrade, as the application is setup on a server and only the server would require upgrading (Chapman et al., 2000).

Research by Chapman et al. (2000) has shown that ICT systems based on market standards and easily available add on do better in the market as service and support is available and prices are kept down due to market forces of supply and demand. Nonstandard ICT systems that use specialized hardware and software usually require skills that are rarer to find and thus tend to be more expensive (Chapman et al., 2000). The same market forces and widespread competition that tend to lower service costs for ICT hardware and software make it more expensive to service and maintain nonstandard ICT systems (Tan and Wu, 2003).

2.4.1.1.3 Training and Routine Maintenance Costs

Some tangible costs need companies to research on them, in order to evaluate their actual cost. For instance, training employees, to perform system maintenance and the costs associated with upgrades contribute to cost of ownership (Chapman, James-Moore,

Szczygiel, and Thompson, 2000). Even if the costs are considered in the overall cost of purchase, training and upgrading tend to be recurrent expenditure. Companies should also consider costs of operating systems that will manage the ICT equipment or infrastructure and also license cost, whether they are a one of or annual (Chapman et al., 2000).

Application software usually attracts license fees, this expense must be considered by the organization. This software expense contributes a large percentage to the overall cost of acquisition. This is a major cost center for nonstandard systems, software costs can reach to a level that it surpasses hardware cost. While evaluating the cost of software, some of the same factors that affect hardware cost versus performance are applicable (Tan and Wu, 2003).

2.4.1.1.4 Scalability Costs

According to Poon and Swatman (1999) applications designed to expand and scale down without generating expenses during organizational change reduce the cost of ownership of the application. Expansion and consolidation are two ways that organization can manage changes to task output, and each of these methods have a different set of costs relating to them. To improve the bottom line and reduce costs of expansion, the method that gives out a combination of availability and availability while increasing capacity should be considered as the best approach (Tan and Wu, 2003).

Integrating new ICT hardware with existing infrastructure within the organization usually comes at a cost. Easy integration with older systems is often an necessary requirement in ICT systems and platforms, since organizations have a heavy investments in their ICT systems and large scale change overs are uneconomical (Dixon, Thompson and McAllister, 2002). Those ICT systems that show benefits and advantages in terms of seamless integration gives organizations greater lower cost of ownership (Dixon et al., 2002).

2.4.1.2 Intangible Costs of Ownership

Organizations usually don't factor in intangible cost, due to their nature, they are usually hard to quantify and compare across different ICT systems. (Seyal and Rahim, 2006). An organization that can find a way to manage intangible costs in relation to ICT systems and

infrastructure maintenance, can find great savings during the life span of the ICT systems and infrastructure that they have invested time and money on (Seyal and Rahim, 2006).

2.4.1.2.1 Conversion Costs

Companies that have decided to migrate to a new system usually face cost implications of transferring software and data bases to the new system or platform (Seyal and Rahim, 2006). The costs of this migration will largely be dictated by the level of migration needed to transfer all data and software to the new system. Another overlooked factor of migration is the deployment cost, these are costs that are associated with setting up the new system, training of employees to have the needed knowledge and skills to manage the new system and license fees (Seyal and Rahim, 2006). In the course of the migration other applications may be needed to finish the setup, to start backup procedures and restore procedures. All the mentioned costs contribute to the total cost of ownership, as do the maintenance costs linked to the upgrade and the expense associated with hiring and training employees (Chapman et al., 2000).

2.4.1.2.2 Risk Mitigation Costs

According to Thong (1996), adopting and implementing new ICT systems and infrastructure isn't an easy affair, and the process of moving a substantial part of a business operation from one system to another entails a certain degree of risk. Solutions that mitigate risk factors can influence the total cost of ownership, even when organization don't consider the risks as they cannot be quantified economically (Thong, 1996). Organizations should choose systems that reduce the risks associated with ICT system adoption and management, thus reducing the potential loss of income from unforeseen disruption to service delivery (Tidd et al., 1997). ICT systems and hardware that are sourced from a single vendor expose an organization to risk. ICT systems that are carried by multiple vendors reduce the risks to organizations, providing a multiple redundancies in the event that their main vendor stops product support, fails to deliver on obligations, or raises the costs ICT equipment or changes the terms of service level agreements, the organization easily replace them (Dixon et al., 2002).

Another form of mitigation is to acquire systems that are known to be easy to upgrade. This type of mitigation strategy can factor heavily into improving the lifespan of equipment and helping to lower the total cost of ownership over several years of operation without compromising on performance (Dixon et al., 2002). The cost of integration can be a barrier to ICT adoption if the company has invested in specialized hardware and software. To mitigate these risks, organizations should invest in ICT system and applications that are standardized (Dixon et al., 2002). According to Dixon et al. (2002), Choosing ICT solutions that have been tested and deployed under a wide range of conditions and situations can help minimize implementation risks.

2.4.1.2.3 Operation Costs

Over the life cycle of ICT systems or infrastructure, certain factors will affect the operating costs of the system that the organization has invested in (Dixon et al., 2002). According to Seyal and Rahim (2006), the overall usability of a system affects everyone who makes use of the resources and accesses data stored on that system. Organizations where downtime can adversely cut into profits consider availability to be important in the systems they employ to support business processes (Seyal and Rahim, 2006). In environments where a few minutes of downtime can cost an organization millions, availability and reliability of ICT systems can mean the difference between a thriving business operation and a business that struggles to maintain customer confidence and integrity. Organizations that can manage operating costs can reduce cost of ownership over the lifespan of their ICT systems and infrastructure (Seyal and Rahim, 2006).

2.5 Owner/Top Management Support of ICT on Adoption by SMEs

The Owner/Top Management support of ICT factor refers to owners and top management level of ICT knowledge and skill, education their willingness to adopt ICT and their perception of ICT in relation to how it can help their companies gain a competitive advantage. According Chuang, Rutherford, and Lin (2007) research, support given by owners and top managers in regards to ICT adoption, is important for the successful adoption of ICT, thus a highly skilled and knowledgeable management is more likely to adopt ICT systems. Wojtkowski and Hardesty (2001) in their study revealed, that successful implementation of

ICT initiatives within organizations, highly depend on their key managers being knowledgeable of new technological trends.

Other studies especially in developing economies have cited the importance of key managers and owners having basic knowledge of ICT (Silvius, 2004). In a study carried out in Indonesia, to ascertain the factors that drive adoption of ICT within SMEs, it was found that the level of ICT knowledge and attitude towards ICT of the owners of the companies, would determine whether that organization would be willing to adopt ICT (Utomo and Dodgson, 2001). In a study done by Caldeira and Ward (2002), the research found that companies that had found success in adopting ICT systems and infrastructure, had top management who were willing to adopt new systems to improve work output, or had partnered with an IT firm that offered consulting services and managed their ICT infrastructure. There exists plenty of research that shows the importance of owner and top management support to the successful implementation of ICT systems (Al-Qirim, 2004).

2.5.1 Owner/Top Manager Factors

Factors that contribute to an individual's perception of technology are an important aspect of the adoption of ICT in any company. Research has shown that in majority of SMES key management positions are held by owners of the company. Many SMEs throughout the developing and developed world are managed by their founders (Duncombe and Heeks, 1999). The following sections describe the owner, manager's individual aspects affecting ICT adoption.

2.5.1.1 Owner/Top Manager Characteristics

Research continues to recognize the importance of the owner and top managers in the adoption and use of ICT amongst SMEs (Caldeira and Ward, 2002), (Cragg and King, 1992), (Thong and Yap, 1995), (Bharadwaj, 2000). Owner and top manager factors relate to executive decisions that the SME owner or top manager must make, what financial commitments to commit to relating to the overall vision of the company, acquisition of new ICT infrastructure, whether the SME must consider ICT adoption or not, their knowledge and appreciation of ICT and new technological developments.

This could be expected since the owner or top manager is the catalyst of all business undertakings in the company (Thong et al., 1995). The problem comes when the manager is reluctant to push for ICT adoption and developments. A well informed SME owner and or manager usually transform the SME objectives to grow the company further (Brynjolfsson and Yang, 1996). Where the owner or manager of the SME tends not to appreciate the value of ICT systems and applications, there is stifled growth in the firm (Brynjolfsson et al., 1996). Previous studies have further shown that a combination of owner or top manager perspectives and attitudes towards ICT adoption and use, play an important role in the development of internal ICT competencies, and provide an important contribution to the development of an environment that enables ICT adoption and use (Caldeira and Ward, 2002).

2.5.1.2 Level of Education

Education is the corner stone of any successful venture, thus having an acceptable level of education will enable business owners to appreciate new technological advances and how they can be applied in their companies. Extant studies have found that one of the criteria for successful ICT adoption amongst SMEs is the level of education of top managers and owners (Thong et al., 1995), (Sarosa and Zowghi, 2003). Certification such as Kenya Certificate of Secondary Education (KCSE) or its international equivalent is important as it guarantees that the individual is able to understand complex concepts and information, and translate this information into actionable data that will enable them to make a more informed decision (Thong et al., 1995). In developing economies where the population may not benefit from higher education, the owners of SMEs how fall into this category may have challenges in the adoption and use of ICT systems and applications (Nyagah, 2015). A general acceptable level of education would be a high school ordinary level certification, although higher business studies are preferable.

2.5.1.3 ICT Knowledge and Skill of individual

Researchers have found that the level of an individual's knowledge of ICT directly affects the adoption of any given technology that is presented to the individual. Owners and top

managers of SMEs who have an acceptable level of ICT knowledge are more likely to encourage ICT adoption and use in their companies (Teo and Ranganathan, 2004). A higher level of appreciation of ICT benefits by the owner or key manager will directly influence considerations for further ICT adoption in the business (Montazemi, 2006).

Due to the availability of resources such financing and ease of entry into the business sector due to better policies and a knowledgeable population, SMEs in developed countries have a better knowledge of ICT than those in developing countries (Teo et al., 2004). In a comparative study of how SMEs in the US and Canada manage ICT, Montazemi (2006) found that SMEs in US make better use of ICT and are better guided in managerial decisions-making. Karakaya and Shea (2008) demonstrated a high satisfaction of ICT initiatives in US companies which has resulted in expected levels of ICT adoption success. In most developing countries, a low literacy level amongst SMEs owners and top management is prevalent (Nyaga, 2013). This makes it difficult particularly for owner and top managers to appreciate and comprehend the competitive advantages of ICT on the market. The inability and lack of access to information related to ICT and general management skills was cited as one of the factors affecting SMEs in the appreciation of ICT in Botswana (Duncombe and Heeks, 2002).

Some SME owner and top managers lack the enthusiasm and imagination to act beyond their environment (MacGregor and Steriacchini, 2006). In most cases, especially in developing countries, SME managers would do just the minimum to make themselves abreast with ICT. Many who have complained about the cost of technology for ICT adoption have not explored other inexpensive ways of accessing ICT applications, such as open source software, short message service (SMS) facilities and other new generations of ICT (Scupola, 2010).

Previous studies (Mutula and Van Brakel, 2007), (Cragg and King, 1992) emphasized the importance of skilled ICT personnel within the organisation or from outsourcing firms to assist in deploying and using ICT. Scupola (2010) found in his study of SMEs based in Britain that ICT adoption in the SMEs that participated in his research was enhanced when the SMEs had the services of employees who had the skills and knowledge in regards to ICT.

2.5.1.4 Social and Cultural issues

A number of researchers have stated the need to consider cultural and social issues as factors that influence the adoption information technology in developing country (Alberto and Fernando, 2007). They further explain that social and cultural issues are often disregarded when ICT technology is transferred from developed countries to developing countries where it is implemented (Bharadwaj, 2000).

The difference in culture between communities and countries can have an impact on the organizations ability to implement and use ICT. Research on the diffusion of ICT (Tan and Macaulay, 2009), has demonstrated the impact of culture and shows that ICT and innovation diffuses differently according to the social and cultural setup of the population. Although culture has been acknowledged for its importance in recent research, its influence on ICT adoption and use has received little attention from information technology researchers (Utomo and Dodgson (2001). As this study is set out to research ICT adoption in Kenyan SMEs, which is a developing multicultural country that is part of the African continent, it would be beneficial to examine and understand the African culture.

There have been a number of studies, that have touched on African culture and how culture affects how organization conduct business, and in turn how culture can affect the adoption of new technology (Eze, Okoye, Chukwuemeka, and Anazodo, 2011). Each African country has a unique cultural set up that dictates individuals believes and actions, and this finds also influences organizational culture, but there are several traits that can be found across different African cultures that are unique to our continent. (Eze et al., 1998). Several social characteristics, such as patriarchal family structures, pyramidal class structures, expressive social interactions, and the importance of physical face to face communication, have been seen to span the across African cultural setup (Eze, Okoye, Chukwuemeka, and Anazodo, 2011). Studies have shown that Africans have a strongly community based culture compared to the individualist culture found in the western countries.

Research has demonstrated that culture influences the acceptance and adoption of technology (Duncombe et al., 1999). As a result, according to Caldeira and Ward (2002) there will be a higher adoption rate if the organizational culture of the adopting company are considered,

rather than forcing the adoption of technology on the company or organization without considering organizational culture (Al-Qirim (2007).

2.6 Employee's ICT Knowledge and Skill of ICT on Adoption by SMEs

Previous research has shown that organizations are increasingly depending on the skills their employees acquire during their career, and it is important for these organizations to be aware of their employee's knowledge and skills especially in regards to information technology (Cragg et al., 1992). Reynolds, Savage and Williams (1994) in their research found that SME owners and top managers are less likely to adopt ICT if their employees are not familiar with the common ICTs used in the business environment. This occurs because SMEs may not be in the position to hire or train employees so that they may acquire the skills and knowledge needed to aid the company adopt and use ICT (Reynolds et al., 1994).

The lack of suitable skilled employees and managerial staff with sufficient ICT knowledge is a significant factor that determines the implementations and use of ICT (MacGregor et al., 1996). Allison (1999) found that When companies have skilled and knowledgeable employees their ability to adopt and use ICT increases, thus leading to successful adoption of ICT in their organizations. More researchers conducted by researchers such as Cragg and King (1992) lead us to believe that when SMEs lack employees and managers with the desired knowledge of ICT, these employees may become a deterrent to the adoption of Information technology as they may feel overwhelmed or threatened by the introduction of technology in their tasks (Cragg and King, 1992).

2.6.1 Employee age Factor on ICT knowledge and skill

Several researchers have found that compared to younger employees older employees tend not to have the necessary qualifications and skills to use ICT systems deployed in their organizations (Cragg and King, 1992). Fink and Disterer (2006), researched on the relationship between ICT use and the age of the employee in a study done on American employees. Fink and Disterer (2006) found that employees younger than fifty years were more likely to adopt and use ICT than employees older than fifty years. Reynolds et al. (1994) study also found that employees aged below thirty five years were more likely to

adopt and use ICT than employees above thirty five years of age in a study done on German male employees. Allison (1999) in her research found that younger employees are willing to learn and implement new technology compared to older employees, additionally probability of employees using complicated ICT system is lower amongst employees over forty years.

There is research that shows a bias to older employees in regards to ICT advancement in organizations (Lucchetti, and Steriacchini, 2004). Lucchetti et al. (2006) conducted a study on the effects of ICT innovation on the salaries of older employees and employees who didn't have the skill to effectively use ICT. Their study revealed that salaries of older employees who were seen as not being ICT savvy were lower than younger employees who had acquired ICT skills and knowledge. There are only few studies, which analyze the relation between process innovation and the age of the employees. Allison (1999) researched the factors that affect process innovation in manufacturing companies. Allison's (1999) research found, that an increasing employee age, reduces the probability of manufacturing process innovation and development. Chang and Cheung (2001) researched on relationship between age and ICT qualifications and its impact on ICT progress in Japanese organizations. Their research found no significant impact of old workers with high ICT skills on the rate of ICT progress in majority of organizations. Allison (1990) in her study posits that older employees are will not be willing to adopt ICT systems as they are approaching retirement and don't have the incentive to adopt new technology Investment in ICT skills does not pay as they are retiring.

Allison (1990) also states that employees who have ICT skills tend to retire latter than employees lacking in ICT skills and knowledge as they still see they are relevant in the workplace. Furthermore, Kotelnikov (2007), research reveal that the phenomenon of older employees not adopting and using technology can be attributed to occupation and education of the employees. with the advancement in technology and innovation some employees in organizations may find their skills to be obsolete, thus these employees may resists the adoption and use of technology that may render them unemployed (Zhang, Waszink, and Wijngaard, 2000). Zhang et al. (2000) argued that the ability to learn how to use new technology reduces as the employee gets older.

This can be viewed as the economic model of the labour market in many economies. When

employers are asked what kind of characteristics can be found in older employees human resources officers reply that skills like learning aptitude, willingness to learn or flexibility are harder to find in older employees compared to younger employees (Burns and Bush, 2010). These characteristics are important, especially when it comes to ICT innovation process, adoption and use in organizational. There is a lot of research that suggest that ICT innovation change in organizations cannot be successful without organizational change. Thus, ICT investment and organizational investment in training employees and hiring skilled employees are strategic to the growth and success of the organization (Brynjolfsson and Yang, 1996). This is due to the changing organizational structure, moving to a flat setup, employees have more responsibility in the new organization structure and make key decisions on the direction the company is moving.

The use of ICT in the workplace and new practices such as teamwork oriented employee interaction (Gera and Gu 2004, Webster 2004) provides a more conducive environment for ICT adoption and use as there is a support network for employees (Caldeira et al., 2002). The adoption of ICT systems and new infrastructure may require the organization to restructure its functions and organization structure in order to fully implement the system (Cela, 2005). This means that appears employee reorganization has to be implemented accordingly to make the operating process more efficient. On the other hand the introduction of team work and a flat organization structure may become a factor that influences the adoption and use of ICT within an organization (Cela, 2005).

Other Researchers however have found that workplace practices that are supposed to encourage the adoption of ICT within the organization may be punitive to older employees who may be viewed as holding back innovation. Jackson (2007) in his research found that organizational changes that are meant to foster innovation advancements have significantly negative effects on the retention rates of older employees who have more experience than younger employees. Alam (2007) provide in their studies provide evidence when they found that the more innovative practices are applied in the organization the lower the input and contribution of older employees. Market forces such as competition, customer requirements, and new regulations may push organizations to adopt ICT systems and infrastructure to remain competitive and survive, thus employing ICT practices that may push out older employees who have significant experience in the market place but may not have the

required ICT knowledge and skills required for the use and adoption of new technology (Jeyaraj, Rottman, and Lacity, 2006).

2.6.2 Staff Training on ICT Skills and Knowledge

Beckinsale and Ram (2006) research found that education levels correspondents to employee level of adopting new innovation. Beckinsale and Ram (2006) further conclude that their ability to find sustainable solutions explains why people who are more educated are more willing to adopt and use new technology to improve their work output, and therefore the relationship between education and both ability to learn and attitudes towards ICT systems and innovation suggest that organizations that have implemented and use ICT systems are those that have more highly educated top management team (Sánchez, Martínez-Ruiz, and Jiménez-Zarco, 2007). For organizations to fully benefit from the adoption and use OF ICT, there also exist a need to invest in capacity building and skills training for their employees. Sánchez et al. (2007) revealed that, ICT training is a primary organizational factor because it helps users to understand how to best use and adopt ICT. Sánchez et al., (2007) research also showed that when companies neglect to train their employees, the skill deficit becomes a barrier to the adoption of ICT within the organization. Sánchez, et al., (2007) in their research found that the main barrier of ICT adoption amongst SME is the lack of awareness of the benefits to be derived from ICT implementation coupled with the lack of ICT training for the employees both at application and theoretical level.

Employee skill and knowledge can be improved by emphasizing the need for education advancements, to the employees and offering incentives for employees to take training and advanced courses to improve their level of education (Fishbein and Ajezen 2005). Harindranath, Dyerson, and Barnes (2008) in their research found that a work force that is highly educated is more likely to adopt and implement ICT initiatives in the organization. The result of Fishbein and Ajezen (2005) research on ICT adoption in Malaysian SMEs, indicate that 130 out of 180 companies didn't make it a priority to develop training programs for their employees this in turn resulted in employees with no ICT skills or knowledge tacking charge of ICT initiatives in the companies, which became a hindrance to ICT adoption and use. The adoption of continuous training solutions can play an important role in increasing the awareness of the huge potentialities of ICTs for concrete situations; in these

way employees and managers can acquire a learning culture, integrating the training in their work activities and understanding in depth the potentialities of communication and information tools (Harindranath et al., 2008).

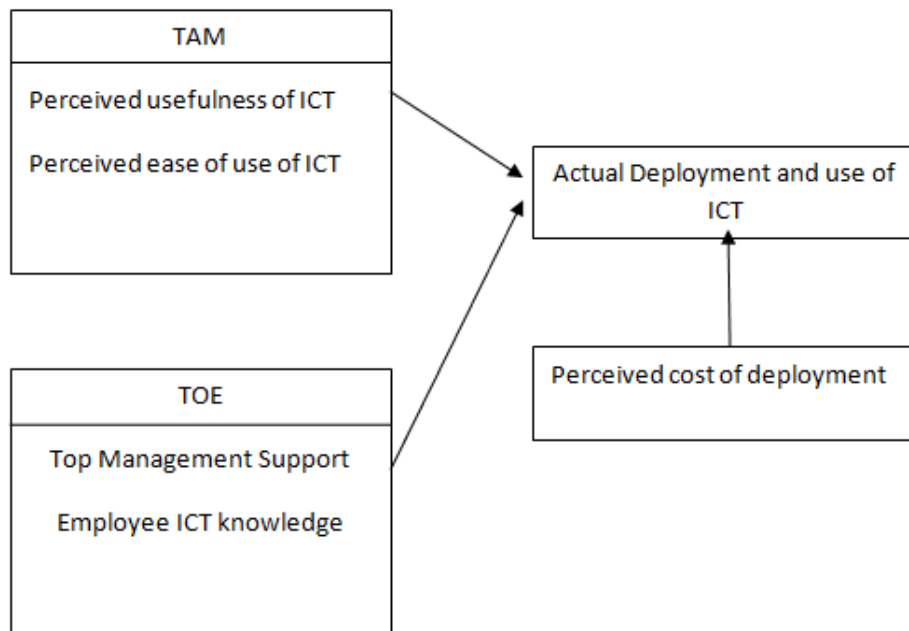


Figure 1: Proposed research Model (Authors Illustration)

2.7 Chapter Summary

This chapter presented a review of available literature relating to various factors that have been researched in regards to factors influence the adoption of ICT systems and applications by SMEs. Most studies have indicated that perceived use of ICT its ability to be easily adopted and cost are the major factors that affect levels of adoption of ICT by SMEs. SMEs that adopt ICT systems and application were found to be more productive and profitable. The literature review will therefore enable an informed and more focused study of the factors that affect ICT adoption. Chapter three covers the research design and methodology which highlights the design and methodological issues that will be adopted in this study.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Introduction

The methods and procedures that were used by the researcher to answer the research questions will be described in detail in this chapter. This chapter will include the research design, population, sampling procedures used and the reason behind research design choices. This chapter will also give details of the data collection method, research procedures and data analysis employed by the researcher.

3.2 Research Design

The researcher used descriptive research design, where responses and views held by the participant in the research were collected and studied. Descriptive research design is employed to study a population, by selecting samples to find and analyze occurrences at any given point in time Orodho (2008). The utilization of the chosen design was justified for the study as it took into account the current views and existing connections, and in addition the examination of variables under study.

The study used structured questionnaires for data collection, which were designed to capture the participant's perception and knowledge of adoption and use of technology in SMEs in Nairobi city. Once information on the current situation was obtained, regression analysis was used to investigate the relationship between variables. The main advantage and purpose of using descriptive statistics was to change information or data into numerical form for ease of analysis and interpretation.

3.3 Population and Sampling Design

3.3.1 Population

According to Garison (2012) a population in the context of research describes the sample population the researcher has chosen, through a sampling process to collect data from and

generate findings from, so that the researcher may generalize results of the research to the entire population. The population comprised of SMEs in various sectors of the economy that operate within the city of Nairobi. The study population encompassed all owners of SMEs, managers or any person involved with the decision making process of SMEs. The choice of SMEs was based on the fact that majority of these companies have used some form of ICT solutions. Additionally it was also easier for the researcher to carry out data collection from this target population since he resides in the chosen city.

Table 3.1 Population Distribution

Types Of SMEs	Targeted Population	Percentage
Sole proprietorship	20	8
Partnership	20	8
Limited liability company	174	70
NGO	20	8
Society based organizations	16	6
Total	250	100

source Enablis kenya (2015)

3.3.2 Sampling Design

3.3.2.1 Sampling Frame

A sampling frame refers to the population that can be accessed during a research study, which is the size of the population that can be identified and accessed by the researcher. The researcher can select a manageable sample of the population targeted for the study from a sample frame. Because a researcher rarely has direct access to the whole population of interest in any type of research, a researcher must rely upon a sampling frame to represent all of the individuals of the population of interest. The sampling frame can be the entire population or part of the population. In this study, the sampling frame included all SMEs that operate in Nairobi and its environs with the following characteristic; SME who are employing at least one ICT system in their everyday business operation.

3.3.2.2 Sampling Techniques

Sampling techniques are methods used to select a sample from the population by reducing it to a more realistic and manageable size. According to De Leeuw, Hox and Dillman (2008) these sampling techniques are used when inferences are made about the target population.

Random, Convenience and Purposive sampling was utilized in this study. First, random sampling was used to select the SMEs within the Nairobi area to ensure that all SMEs that have the attributes being investigated have equal chances of being selected. Then convenience sampling was used to select participants these were owners or the decision makers of the SMEs. This ensured that only participants with the characteristics that the researcher required were chosen for the study. Purposive sampling was employed to ensure that all the firms selected employ at least one ICT system in their business.

3.3.2.3 Sample Size

Determining the sample size is the act of selecting the number of observations to include in a statistical sample. The researcher used Yamane's (1967) formula for calculating sample size. n will represent the sample size, N will refer to the size of the population and e is the margin of error. A 95% confidence level and $e = 0.05$ are assumed for Yamane's (1967) equation shown below.

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

For this study, $N = 250$ and $\varepsilon = 0.05$. At 95% confidence level, this translated to a sample size of 375 participants out of a target population of 153.

Table 3.2: Sampling Frame and Sample Distribution

Strata	Population		Proportionate sample	Population
Sole proprietorship	20	$n = N/1 + N (e)^2$	Sole proprietorship	14
Partnership	20	$n = N/1 + N (e)^2$	Partnership	14
Limited company	174	$n = N/1 + N (e)^2$	Limited company	101
NGO	20	$n = N/1 + N (e)^2$	NGO	14
Society	16	$n = N/1 + N (e)^2$	Society	10
Total	250	$n = N/1 + N (e)^2$	Total	153

This comprised of SMEs in the areas of finance, retail, manufacturing, hospitality, Information technology and education. The researcher chose this sample size of 153 SMEs in order to effectively manage the responses due to time and resource constraints and also to ensure a critical analysis of the phenomenon under study.

3.4 Data Collection

The researcher used a questionnaire the primary data collection tool that was developed based on the research questions discussed in earlier chapters. The Questionnaire was preferred as the researches tool for data collection, since they are found to be stable, consistent, and uniform offering a considered and objective view of issues, which therefore allowed development of valid inferences from the study (Babbie and Benaquisto, 2009). The questionnaires seeked information on three important areas: participants' demographic profile, ICT systems and services in use and factors influencing the adoption and use of ICT. The questionnaire included a five-point Likert scale having the ratings of “strongly disagree” (1) and “strongly agree” (5) for use by participants in indicating their response to each of the items asked in section three. Section one consisted of six questions concerning the respondent's enterprise name, type, function, year in operation, average no. of workers, and estimated monthly turnover. Section two included 5 questions to measure the respondent's use of ICT based applications, level of infrastructure development and level of ICT policy implementation. Section three consisted of 21 questions pertaining to the five factors proposed in the hypothesis-Perceived Usefulness, Perceived Ease of Use, Perceived Cost of Deploying ICT systems and services, Owner/Top Management Support and Employees ICT Knowledge and Skill.

The validity of the content is guaranteed by the backing of individuals who are experts in the given field of study (Gay, 2002). The research data collection tool was validated by the expert knowledge of the supervisor and other experts who validated the questionnaire. The reliability of the research instruments as established by piloting the research questionnaires using 12 independent SMEs who didn't participate in the final research.

Each respondent was provided with a copy of the questionnaire, explained how the questionnaire was to be filled out and collected. This allowed for sufficient time to fill up the questionnaire without interfering with their work. Their responses formed the basis for the analysis and subsequent discussions.

3.5 Research Procedure

The researcher, in his effort to ensure that the research instruments used in data collected were structurally sound, had relevant questions and would collect valid content, he submitted the questionnaire to experts for review. The experts included the researcher's supervisor who ensured the questionnaires captured all the information the researchers needed for the study. Piloting of the questionnaires was also done using a small sample of 12 participants, whose data wasn't included in the final research data. Simple random sampling was used by the researcher to choose the participants within each of the available sub-groups. The pilot study was used to find items in the questionnaire that were vague or uncertain to the participants. The piloting of the questionnaire also aided the researcher to get familiar with administering the research tool and ensuring that participant's answered the questionnaire honestly.

The questionnaires were administered to the participants via email through the use of online forms. Confidentiality and privacy of the respondents was maintained as the questionnaire didn't require them to divulge any personal information that may be used to identify them. The participants were not persuaded in any way to disclose and discuss information they were not comfortable with. The participants were also made aware of the purpose of the research and the benefits of the research to their companies. Information that was provided by the respondents was to be used for the purpose of this research and the respondents were made aware of this fact. To ensure that there was going to be a high response rate the researcher occasionally followed up with the respondents.

3.6 Data Analysis Methods

Once the researcher had completed the collection of data from the respondents, the data had to go through a coding process, where the data collected was converted to numerical values and uploaded to the statistical software (SPSS) that was being used for the purpose of creating inferences to the research subject. This is a type of analysis that examines the relationship between two variables drawn from the same sample population. In this study, inferential statistics was carried out for bivariate analysis using Pearson correlation in SPSS for interval and ratio data (Zickmund and Babbin, 2007).

3.7 Chapter Summary

The methods and procedures to be used to answer the research questions were described in detail in chapter three. Random, Convenience and Purposive sampling was used to select the participants who participated in the study, data was collected by means of a structured comprehensive questionnaire that was developed by the researcher based on the research questions and analysed using Statistical Package for Social Sciences (SPSS) program for analysis to develop a quantitative inference to the subjects of study.

CHAPTER 4

4.0 RESULTS AND FINDINGS

4.1 Introduction

Chapter four presents the analysed results and findings collected through the use of the questionnaire concerning the study research questions that were presented in chapter one. Section 4.2 describes the background information of participants, which describes the rate of response and demographic data of the participants. The second section deals with Perceived usefulness of ICT on Adoption by SMEs. The third section is on Perceived ease of use of ICT on Adoption by SMEs. The fourth sections deals with Perceived Cost of Deploying ICT on Adoption by SMEs, the fifth section covers Owner and Top Management Support of ICT on Adoption by SMEs and the final section is on the Employee knowledge and skills of ICT on Adoption by SMEs.

4.2 Background Information

4.2.1 Response Rate

The study sample consisted of 153 participants. A total of 135 participants returned their questionnaires of which 12 were incomplete .The remaining 123 questionnaires were used for data analysis. The participants were persons well placed to knowledgably answer the questions on the state of ICT in their respective companies and businesses. The data implied that a proportionate number of the sample participated in the research.

Table 4.1: Response rate

Sample	Distribution	Percentage
Participated	135	88
Non Participated	18	12
Total	153	100

4.2.2 Company Registration Profile

The organization profile depicted in Table 4.2 shows that a large number of the companies were registered entities. 61% of participants were associated with limited liability companies, 16% were registered Non-governmental organizations which are nonprofit driven entities, 13% registered society groups such as Cooperatives and 10% percent were registered as sole proprietorships and partnerships. The result state that a significant number of the participating companies are registered as limited liability companies.

Table 4.2: Type of Organization

Company type	Distribution	
	Frequency	Percent
Sole proprietorship	6	4.9
Partnership	6	4.9
Limited liability company	75	61
NGO	20	16
Society	16	13
Total	123	100

4.2.3 Industry profile

Table 4.3 represents the industry profile of the participants. The industry in which an organization operates can be a factor in the adoption and use of ICT amongst companies in the given industry. 27% of the participants were in the financial services industry, education, medical and ICT based companies made up 13% each of the participants, manufacturing was 8.9%, Property Development and real estate based companies made up 9.8%, transport based companies took up 7.3% and Hospitality made up 6.5% of participants. The result show that there was an even distribution of companies across all industries thus the results of the study took into account the views of SMEs operating in these industries.

Table 4.3: Industry profile

Industry Type	Distribution	
	Frequency	Percent
Manufacturing	11	9
ICT	16	13
Financial Services	34	27.5
Medical	16	13
Education	17	13.8
Hospitality	8	6.5
Transport	9	7.3
Property Development	12	9.8
Total	123	100

4.2.3 Employees Profile

Table 4.4 below represents the employee profile of the participants. The data showed that 64% of participants had over 40 employees, 18.7% had up to 10 employees, 11.4% between 11 to 20 employees, 4.1% had 31 to 40 employees and 1.6 had 21 to 30 employees. The result implies that a significant number of companies have employed over forty employees, fortifying the need for ICT systems such as Human resource systems to better manage their workforce.

Table 4.4 Employee profile

Number of employees	Distribution	
	Frequency	Percentage
1-10	23	18.7
11- 20	14	11.4
21-30	2	1.6
31-40	5	4.1
over 40	79	64
Total	123	100

4.2.4 ICT Systems Profile

Table 4.5 represents the ICT systems profile of the organizations that participated in the study. The data revealed that 82% of participants had deployed a network setup in their premises where they could share resources such as printers. 56% have a Human Resource

system to manage their payroll, 52.5% used a form off accounting system such as QuickBooks, 34% deployed a CRM to manage customers, 44.9% used a type of ERP to manage their companies and 39% have a form backup and data recovery system. The results implies that a significant number of the participants have deployed some type of ICT system that is enabling them to perform their functions more efficiently.

Table 4.5: Systems Profile

ICT system profile	Distribution		Percent of Cases
	frequency	Percentage	
HR System	67	18.3	56.8
Accounting Systems	62	16.9	52.5
CRM system	41	11.2	34.7
ERP system	53	14.5	44.9
LAN setup	97	26.5	82.2
Backup and data recovery	46	12.6	39.0
	366	100.0	

4.3 Perceived usefulness of ICT on Adoption by SMEs

The study assessed the impact of perceived usefulness of ICT systems and applications on adoption of ICTs behaviour by SMEs seeking respondent views on profitability, productivity, improved business processes, communication within the company and with customers.

Table 4.6 shows that when an ICT system is perceived to improve productivity it enhances the adoption of the system by the SMEs ($r= 0.271^{**}$, $p< 0.002$, $N=123$). The study also shows that an ICT system that is perceived to positively impact companies profitability enhances the adoption of the system ($r= 0.684^{**}$, $p< 0.000$, $N=123$). The table also shows when a system is perceived to improve business processes it enhances the adoption of the system ($r= 0.273^{**}$, $p< 0.002$, $N=123$).

Also ICT systems that are perceived to improve communication within the organization enhance the adoption of the system by the SME ($r= 0.269^{**}$, $p< 0.003$, $N=123$). The table also shows that when a system is perceived to improve customer communication and relations it enhances the adoption of the system ($r= 0.255^{**}$, $p< 0.004$, $N=123$).

Table 4.6: Perceived usefulness

Question		Adoption of ICT systems by SMEs
Improved productivity	-Pearson Correlation	.271**
	-Sig. (2-tailed)	.002
	N	123
Positive impact on companies profitability	-Pearson Correlation	.684**
	-Sig. (2-tailed)	.000
	N	123
Work flow and improved business processes	-Pearson Correlation	.273**
	Sig. (2-tailed)	.002
	N	123
Communication within the organization	-Pearson Correlation	.269**
	-Sig. (2-tailed)	.003
	N	123
Communication with customers	-Pearson Correlation	.255**
	Sig. (2-tailed)	.004
	N	123
**. Correlation is significant at the 0.01 level (2-tailed).		

4.4 Perceived ease of use of ICT on Adoption by SMEs

The study assessed the impact of perceived ease of use of ICT systems and applications on adoption of ICTs behaviour by SMEs seeking respondent views on accessibility, reliability, availability, and usability. Table 4.7 shows that when an ICT system is perceived to always available it enhances the adoption of the system by the SMEs ($r= 0.373^{**}$, $p< 0.000$, $N=123$). The study also shows that an ICT system that is perceived to reliable it enhances the adoption of the system ($r= 0.379^{**}$, $p< 0.000$, $N=123$). The table also shows when a system is perceived to be easily accessible it enhances the adoption of the system ($r= 0.373^{**}$, $p< 0.002$, $N=123$). Also ICT systems that are perceived to user friendly enhance the adoption of the system by the SME ($r= 0.361^{**}$, $p< 0.000$, $N=123$).

Table 4.7: Perceived ease of use

Questions		Adoption of ICT systems by SMEs
Always available	-Pearson Correlation	.373**
	-Sig. (2-tailed)	.000
	N	123
Easy for employees to use in performing their duties	-Pearson Correlation	.361**
	-Sig. (2-tailed)	.000
	N	123
Easily accessible	-Pearson Correlation	.337**
	Sig. (2-tailed)	.000
	N	123
Organization are reliable	-Pearson Correlation	.379**
	-Sig. (2-tailed)	.000
	N	123

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

4.5 Perceived Cost of Deploying ICT on Adoption by SMEs

The study assessed the impact of perceived cost of deployment of ICT systems and applications on adoption of ICTs behaviour by SMEs seeking respondent views on ICT budgets and funding. Table 4.8 shows that when a company has an ICT budget it enhances the adoption of ICT systems by the SMEs ($r= 0.607^{**}$, $p< 0.000$, $N=123$). The study also shows that when ICT projects are easily funded it enhances the adoption of the system ($r= 0.3646^{**}$, $p< 0.000$, $N=123$).

Table 4.8: Perceived cost of deployment

Questions		Adoption of ICT systems
ICT budget	-Pearson Correlation	.607**
	-Sig. (2-tailed)	.000
	N	123
Are easily funded in your organization	-Pearson Correlation	.646**
	-Sig. (2-tailed)	.000
	N	123

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

4.6 Owner and Top Management Support of ICT on Adoption by SMEs

The study assessed the impact of owner and management support of ICT systems and applications on adoption of ICTs behaviour by SMEs seeking respondent views.

Table 4.9 shows that when management views ICT as a strategic resource it enhances the adoption of the ICT by the SMEs ($r= 0.658^{**}$, $p< 0.002$, $N=123$). The study also shows that when management allocate resources for ICT development it enhances the adoption of ICT by the company ($r= 0.653^{**}$, $p< 0.000$, $N=123$). The table also shows when management reward employees for championing ICT innovation it enhances the adoption of the system ($r= 0.466^{**}$, $p< 0.000$, $N=123$). Also management that encourage employees to be ICT champions enhance the adoption of the ICTs by the SME ($r= 0.568^{**}$, $p< 0.003$, $N=123$). The table also management that encourages employees to get certified in ICT proficiency enhances the adoption of ICT system ($r= 0.509^{**}$, $p< 0.004$, $N=123$).

Table 4.9: owner, management support

Questions		Adoption of ICT systems by SMEs
ICT as a strategic resource	Pearson Correlation	.658**
	Sig. (2-tailed)	.000
	N	123
allocates a budget for ICT development	-Pearson Correlation	.653**
	-Sig. (2-tailed)	.000
	N	123
reward employees who use ICT to solve business problems	-Pearson Correlation	.466**
	-Sig. (2-tailed)	.000
	N	123
encourages employees to be ICT champions	-Pearson Correlation	.568**
	-Sig. (2-tailed)	.000
	N	123
encourages employees to get certification in ICT proficiency	-Pearson Correlation	.509**
	-Sig. (2-tailed)	.000
	N	123

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

4.7 Employee knowledge and skills of ICT on Adoption by SMEs

The study assessed the impact of employee knowledge and skill on adoption of ICTs behaviour by SMEs seeking respondent views. Table 4.10 shows that there is no significant correlation between employee knowledge and skills of ICT on adoption of ICT by the SMEs. All N values are greater than 0.01 showing no significant relationship between the variables.

Table 4.10: Employee ICT knowledge and skills

Questions		Adoption of ICT systems by SMEs
easily adopt new ICT Systems deployed	-Pearson Correlation	-0.248
	-Sig. (2- tailed)	.016
	N	123
have done basic training in IT (ICDL)	-Pearson Correlation	-.164
	-Sig. (2- tailed)	.070
	N	123
technology savvy	-Pearson Correlation	-.120
	-Sig. (2- tailed)	.185
	N	123
a technical background in ICT	-Pearson Correlation	-.089
	-Sig. (2- tailed)	.330
	N	123

Correlation is significant at the 0.01 level

4.8 Model Summary

In regression analysis, we use model summary and coefficient. Model summary is employed to compare the value of a given variable to another variable and find out whether a prediction can be made. In this case, the variable being predicted is called the dependent variable or sometimes the outcome variable. The variable being used to predict the other variable's value is called the independent variable (Hair, 1995).

Table 4.11: Model summary

Model Summary					
-Independent Variable-	R	R Square	Adj R Square	Std. Error	Sig. F Change
-H1. Perceived Usefulness of ICT-	0.343 ^a	.118	.080	1.02024	.011
-H2. Perceived ease of Use of ICT-	0.450 ^b	.202	.139	.98721	.022
-H3. Perceived Cost of deploying ICT-	-0.755	.570	.527	.73123	.000
-H4. Owner/Top management support	0.815 ^d	.665	.621	.65437	.000
-H5. Employee' ICT knowledge and skill-	0.825 ^e	.681	.626	.65061	.270

The data was analyzed using multiple linear regression analysis following the guidelines established by Hair (1995). Regression analysis main function is to find relationship between a dependent variable to a set of independent variables (Mendenhal and Sincich, 1993). Table 4.11 present the result of predictors of ICT adoption. The regression coefficient of independent variables on ICT adoption was estimated. The overall model is significant at the 1% level.

Of the independent variables, perceived usefulness of ICT, perceived ease of use and owner top management support are predictors statistically different from zero and had a positive significant and direct effect on ICT adoption intention. The remaining perceived cost of deployment had a negative significant and direct effect on ICT adoption, this means that the more expensive a system is perceived to be the lower the likelihood that an SME will adopt the system. Employee ICT skill and knowledge had no significant direct effect on ICT adoption intention according to the research findings.

There is a significant relationship between H1 perceived usefulness of ICT and intention to adopt ICT with Sig $P \leq 0.05$, $P = 0.011$. This shows that there is a positive correlation between perceived usefulness of ICT and intention to implement ICT. The data shows that There is a significant relationship between H2 perceived ease of use ICT and intention to adopt ICT with Sig $P \leq 0.05$, $P = 0.022$. This shows that there is a positive correlation between perceived

ease of use and intention to implement ICT. There is a significant relationship between H3 perceived cost of deploying ICT and intention to adopt ICT with Sig $P \leq 0.05$, $P = 0.0001$. This indicates that there is a negative correlation between cost of deployment and intention to implement ICT. There is a significant relationship between H4 owner/management support and intention to adopt ICT with Sig $P \leq 0.05$, $P = 0.0001$. This indicates that there is a positive correlation between cost of deployment and intention to implement ICT. The data shows that there is no significant relationship between H5 and intention to adopt ICT. As Sig $P \leq 0.05$, $P = 0.270$. This indicates that there was no correlation between employee ICT Knowledge and intention to implement ICT.

4.8.1 Structural Model

To assess the structural model quality, the study tested the model for the statistical significance of the estimated model's path coefficients and the ability of the model to explain the variance in the dependent variables (R^2). This was done using linear regression.

Figure 2 shows that perceived usefulness and ease of use have a positive influence on adoption of ICT; they have R^2 of 0.11 and 0.20 respectively. These R^2 values surpass Falk and Miller's (1992) recommendation that R^2 should be greater than or equal to 10% as an indication of substantive explanatory influence. Effect of Management support on adoption of ICT was 0.615 indicating approximately 61.5% of the variance in adoption of ICT is due to Management support. Of the four factors, only Perceived cost had a significant negative effect on Usage ($= -0.57$ significant at $p < 0$).

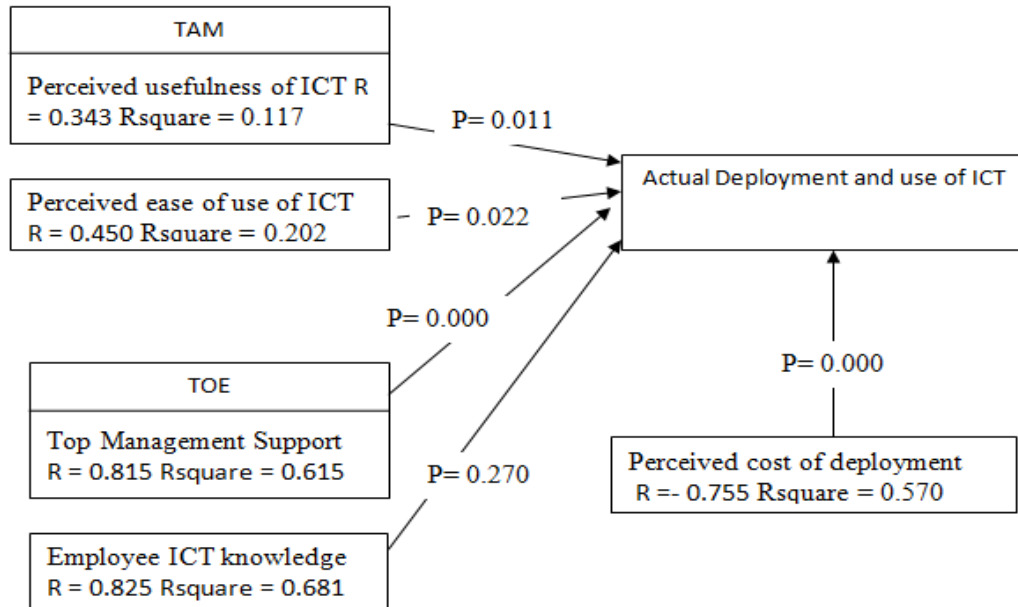


Figure 2 structural model

4.9 Chapter Summary

Chapter four was concerned with representation of results and findings of the data that was collected from participants through the use of data collection instrument, specifically the questionnaire. The chapter provided analysis on the background information, perceived usefulness of ICT systems and applications, perceived cost of deployment of ICT systems, perceived ease of use, management support and employee knowledge and skills in regards to ICT adoptions behavior.

CHAPTER 5

5.0 DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter is the final part of the study. In this chapter the author will discuss the findings described in the previous chapter, the conclusions derived from the data analysis and recommendations for further studies. The chapter is arranged into different sections: 5.2 will cover the summary. Section 5.3 is about discussions while section 5.4 contains the conclusions of the study and lastly, section 5.5 demonstrates the study recommendations.

5.2 Summary

This research study set out to examine the factors that influence adoption of ICT systems and applications by SMEs in Kenya. To achieve the purpose, the study aimed at examining the relationship between perceived usefulness of ICT applications and ICT adoption behavior by SMEs based in Nairobi, the relationship between perceived ease of use of ICT applications and ICT adoption behavior by SMEs based in Nairobi, relationship between perceived cost of deployment of ICT applications and ICT adoption behavior by SMEs based in Nairobi, relationship between owner and management support of ICT and ICT adoption behavior by SMEs based in Nairobi and the relationship between employee knowledge and skill of ICT and ICT adoption behavior by SMEs based in Nairobi.

The researcher used descriptive survey design to make sure that the research problem was well structured and understood. Descriptive survey is usually employed, to study a population by selecting a sample of the population to find and analyze a phenomenon at a particular point in time. The researcher employed the use of questionnaires to get collect data from participants. The study focused on a sample size of 153 SMEs who were given questionnaires to fill which 135 returned their questionnaires. The researcher used sampling techniques discussed in previous chapters to create a sample size of respondents who provided the data used in the study. The study conducted a pilot study to test the validity and viability of the data collection instrument, from which data was analysed using descriptive and inferential statistics and presented using tables.

From the study, it was found that more SMEs are likely to adopt ICT that they perceive to improve productivity, positively impact profitability, improve business processes and improve communication within the organization and with customers. This is done when the ICT system or application, has wide market acceptance, and proven track record and customer support by the developers.

The study found that SMEs are likely to adopt ICT that they perceive to be reliable, accessible, user friendly and available. This makes the SMEs receptive to adoption of the system as they are not intimidated by its adoption and use. The study found that SMEs are likely to adopt ICT when they have a set budget for ICT development and when management see the value of ICT and avail funding for ICT projects.

From the study, it was found that more SMEs are likely to adopt ICT when management views ICT as a strategic resource, when management allocate resources for ICT development, management reward employees for championing ICT innovation and when management encourages employees to be ICT champions. This is done when management sees the strategic value of implementing ICT systems and applications in their companies. The study also showed that there was no significant relationship between employee knowledge and skills of ICT and adoption of ICT by the SMEs.

5.3 Discussion

5.3.1 Perceived Usefulness of ICT and Adoption by SMEs

The study analyzed the influence of perceived usefulness of ICT systems and applications on adoption of ICT by SMES, thereby finding that SMEs would adopt ICT systems that they perceive would improve productivity, positively impact profitability, improve business processes and improve communication within the organization and with customers.

Lu, Liu, Yu and Yao (2003) research supports the findings as they posit that Perceived usefulness defines user's perception that using a specific application improves output and processes. It provides insight into how actual use and intention to use are influenced. Several studies have shown that the adoption of desktops and laptops, the use of e-mails (Limayem et

al., 1997), the increase in online business (Limayem et al., 1997) and the adoption of web applications (Chang and Cheung, 2001) depend on their perceived usefulness by users before they adopt them. According to the theory of diffusion of innovations (Rogers, 1995), the diffusion cycle of ICT within a population depends on the factors stated earlier in the literature review, including their relative advantage, which means that the individual perceives the new technology as better than the one that it replaced (Davis, 1986).

As the results of the study show, the acceptance of ICT is influenced by the perception of their potential users. The more they are convinced that their use is improving their performance, the more they adopt and incorporate them in their work. This theory of the positive impact of perceived usefulness of ICT on their use has been verified in many studies (Bukhari, 2008), confirming that perceived usefulness is a determinant of adoption and use of technologies, that the pre-adoption attitude of users is based on the perceptions of the utility of the technology, and that more than sixty percent of the explanatory power of the technology acceptance model is due to the perceived usefulness (Venkatesh et al., 2000). More recently, King and Marks (2008) showed that the use and adoption of knowledge management systems was feasible only if their users perceive them as useful. Based on this analysis, it is clear that perceived usefulness has a positive effect on adoption behavior of companies in regards to ICT. This allows us to conclude that perceived usefulness of ICT has a positive influence on the adoption and use of ICTs.

Theory of self-efficacy supports the findings of the research as it's based on the beliefs that an individual can control their own motivation, behavior and environment supports the results from the research (Bandura, 1982) it is also seen as one of the major influencers of adoption of technology by an individual. Users who consider ICT systems to complicated and believe that they won't be able to use them in their activities usually avoid adopting ICT systems (Ajzen, 1999). Hausser and Simmie (1981) in their research also found that self-efficacy is an influential factor, which determines individual motivation and effort persistence by an individual. The connection between self-efficacy and perceived usefulness is meant to present the effects of self-efficacy on the motivation of the user in adopting ICT.

The results of the research support these views as participants of the research were more likely to adopt ICT in their organization if they were made aware or were shown the benefits and usefulness of ICT to them and to their organization. The short-term results are synonymous with factors of Perceived Usefulness; and the long-term consequences refer to consequential results in one's career or social image, which reflects Rogers (1995) most important motivation for adoption of innovation.

5.3.2 Perceived ease of use of ICT and Adoption by SMEs

The study analyzed the influence of perceived ease of use of ICT systems and applications on adoption of ICT by SMES, thereby finding that SMEs would adopt ICT systems adopt ICT that they perceive to be reliable, accessible, available and user friendly. This makes the SMEs receptive to adoption of the system as they are not intimidated by its adoption and use.

The study is in agreement with Davis (1993) who stated that Perceived ease of use measures the prospective user's assessment of the effort required to utilize ICT systems and applications. Mental effortlessness demanded by users of ICT applications influence the intention to adopt and use ICTs thus, applications and systems that are perceived to be complex and that have steep learning curve are thought risky to adopt (Opia, 2008).

Researchers of Information systems adoption have defined control as ICT self-efficacy, this is a user's belief their ability to perform a given function using an ICT technology (Caldeira and ward, 2002). There is empirical evidence supporting the flow from individual ICT self-efficacy to ICT system perceived ease of use (Venkatesh et al., 1996). According to Caldeira et al. (2002) the research results are verified by the argument that, since there will be a lack of knowledge about a new system, the individuals confidence in their ability to learn will determine whether they will perceive the system as easy to use.

Ease of use is shown to be a significant determinant of adoption and acceptance of ICT in SMEs who participated in this research. A positive correlation between perceived ease of use of ICT and intention to implement ICT supports this premise. The results from the research show that effortlessness demanded by users of ICT applications attracts more adoption behavior; thus, innovations with perceived complexities of user interface and steep learning

curve are thought risky to adopt (Opia, 2008). Perceived ease of use is a distinct but related construct to perceived usefulness. It impacts on near term usefulness, since improvement in it contributes positively to outcomes and ultimately defines perceived usefulness.

ICT users in companies will develop generic perceptions of external control based on prior ICT systems adopted by the organization. Prior to direct experience with the new system environment, such general perceptions of external control are essentially independent of the technology and serve as situational factors in the development of perceived ease of use of the new system (Beckinsale and Ram, 1990). Studies undertaken by scholars to assess observed usefulness and ease of use trade off and to determine the impacts of external variables on these two mental determinants show mixed findings (Chau, 1996, Davis, 1993). Nevertheless, empirical findings confirm the positive relationships between ease of use and attitude towards use (Venkatesh and Davis, 2000) and show that ease of use is a proven key determinant of users' intention to accept the adoption and use of technology.

5.3.3 Perceived cost of deploying ICT and Adoption by SMEs

The study analyzed the influence of perceived cost of deploying ICT systems and applications on adoption of ICT by SMES, thereby finding that SMEs would adopt ICT systems when they have set budget for ICT development and when management see the value of ICT and avail funding for ICT projects.

Extant research agrees with the findings of the study, by revealing that Cost related to deployment of ICT system is a factor that influences SMEs behaviour of adoption. The cost factor of ICT adoption has been studied by various ICT based researchers (Seyal and Rahim, 2006), (Drury and Farhoomad, 1996), (Cox and Ghoneim, 1996) who have found a significant relationship between cost and adoption of technology. SMEs are more likely to adopt ICT systems that are perceived to have lower financial implications that those that do in other words, SMEs are less likely to adopt ICTs when their initial deployment costs are high (Dixon, Thompson and McAllister, 2002). Also research conducted by Poon and Swatman (1999) support the research findings as they found that SMEs often have challenges in acquiring finances to invest in ICT as they may have more pressing managerial commitments, and do not see the immediate need to invest . Also due to the scarce nature of

capital SMEs may find it hard to justify the need to spend money on ICT infrastructure and systems (Reynold, Savage and Williams, 1994).

Total Cost of Ownership (TCO) is a concept used to determine the entire cost of implementing and maintenance associated with ownership of an ICT asset (Seyal and Rahim, 2006). Reducing the cost of ownership of ICT assets will result in higher rate of ICT adoption and use. According to the Tan and Wu (2003), enterprises collectively spend millions of dollars annually on ICT systems and platforms. As competition grows so does the need to capitalize on the competitive advantage derived from employing ICT. Research has shown that the factors that influence the costs of adoption and maintenance of ICT systems are more complicated than just the cost of purchasing hardware; they incorporate both tangible and intangible factors (Reynold, Savage and Williams, 1994).

Tangible costs of ownership provide the most accessible basis for comparing ICT systems and infrastructure that an organization is looking to adopt and use (Reynold et al., 1994). The cost of purchasing ICT equipment, can only serve a basis to determine what entire cost of ownership will be. Only after both the tangible and intangible costs have been considered can an organization know the total cost of ICT system implementation. (Reynold et al., 1994). Organizations usually don't factor in intangible cost, due to their nature, they are usually hard to quantify and compare across different ICT systems. (Seyal and Rahim, 2006). An organization that can find a way to manage intangible costs in relation to ICT systems and infrastructure maintenance, can find great savings during the life span of the ICT systems and infrastructure that they have invested time and money on (Seyal and Rahim, 2006).

Cost of acquiring implementing and maintaining ICT application is a major deterrent to the adoption of ICT applications and systems. Research has also shown that small and medium sized firms encounter difficulties with respect to investing finance to adopt ICT applications and infrastructure, and this unfavorable situation often set back their efforts to adopt needed ICT innovations (Chapman et al., 2000). The research findings lead us to believe that this is the situation for most of the SMEs who took part in the study. Nairobi small and medium sized firms may lack required financial resources to enable them procure and adopt useful and relevant ICT business tools. Prior studies have shown that a lack of financial resources is one of the distinguishing characteristics setting smaller businesses apart from larger

enterprises (Thong, 1996). Tan and Wu (2003) showed that financial matters are vitally important to owners and managers, and such issues often influence the adoption of ICTs in SMEs.

5.3.4 Owner, Management Support of ICT and Adoption by SMEs

The study analyzed the influence of Owner, management Support of ICT systems and applications on adoption of ICT by SMES, thereby finding that more SMEs are likely to adopt ICT when management views ICT as a strategic resource, when management allocate resources for ICT development, management reward employees for championing ICT innovation and when management encourages employees to be ICT champions.

Small and medium sized organizations are known to have a less structured management hierarchy. Thus majority of the company's decisions on investments are usually under the purview of the owners and managers of the company the owner and managers usually make the final decision on the financial expenditure of the company. Due to this characteristics found in majority of SMEs, companies that have managers and owners who are knowledgeable on technological advancements in their industry, are more successful in implementing ICT systems. Research supports the belief that SMEs that are run and managed by owners and managers who perceive ICT as useful to their organization, and are ready to invest in ICT are more likely to adopt ICT systems (Poon and Swatman, 1999).

The Research findings have demonstrated that culture influences the acceptance and adoption of technology. This is in agreement with Duncombe et al., (1999) research. There have been a number of studies, that have touched on culture and how culture affects how organization conduct business, and in turn how culture can affect the adoption of new technology (Ez et al., 2011). Each country has a unique cultural set up that dictates individuals believes and actions, and this in turn influences organizational culture, but there are several traits that can be found across different African cultures that are unique to our continent. (Eze et al., 1998). Caldeira and Ward (2002) posit that there will be a higher adoption rate if the organizational culture of the adopting company are considered, rather than forcing the adoption of technology on the company or organization without considering organizational culture (Al-Qirim (2007).

The results show that owners and managers level of ICT knowledge and understanding of ICT benefits to them and their organization plays an important role in the decision to adopt ICT by the SMEs that participated in this research. Studies especially in developing economies have cited the importance of key managers and owners having basic knowledge of ICT (Silvius, 2004). In a study carried out in Indonesia, to ascertain the factors that drive adoption of ICT within SMEs, it was found that the level of ICT knowledge and attitude towards ICT of the owners of the companies, would determine whether that organization would be willing to adopt ICT (Utomo and Dodgson, 2001). In another study done by Caldeira and Ward (2002), the research found that companies that had found success in adopting ICT systems and infrastructure, had top management who were willing to adopt new systems to improve work output, or had partnered with an IT firm that offered consulting services and managed their ICT infrastructure. Majority of the companies surveyed are run by their owners and their attitude towards ICT greatly determine whether they will adopt ICT systems and applications.

5.3.5 Employee ICT knowledge and skill ICT and Adoption by SMEs

The study analyzed the influence of Employee ICT knowledge and skill of ICT systems and applications on adoption of ICT by SMES, thereby finding that showed that there was no significant relationship between employee knowledge and skills of ICT and adoption of ICT by the SMEs. The results from the research showed that SMEs who participated in the study didn't consider employee ICT knowledge in the decision to adopt ICT Systems and application, thus didn't consider that to deploy ICT systems the employees have to have basic ICT knowledge and skills to utilize ICT systems. This also indicated that majority of the SMEs didn't consider to offer employees training or financial support in developing competencies in ICT.

The study found that education levels correspondents to employee level of adopting new innovation. Beckinsale and Ram (2006) affirm the findings as they conclude that an individual's ability to find sustainable solutions explains why people who are more educated are more willing to adopt and use new technology to improve their work output, and therefore the relationship between education and both ability to learn and attitudes towards ICT systems and innovation suggest that organizations that have implemented and use ICT

systems are those that have more highly educated top management team (Sánchez, Martínez-Ruiz, and Jiménez-Zarco, 2007). For organizations to fully benefit from the adoption and use OF ICT, there also exist a need to invest in capacity building and skills training for their employees.

The study revealed that employee skill and knowledge can be improved by emphasizing the need for education advancements, to the employees and offering incentives for employees to take training and advanced courses to improve their level of education. Harindranath, Dyerson, and Barnes (2008) confirm the results as their research found that a work force that is highly educated is more likely to adopt and implement ICT initiatives in the organization. The result of Fishbein and Ajezen (2005) research on ICT adoption in Malaysian SMEs, indicate that 130 out of 180 companies didn't make it a priority to develop training programs for their employees this in turn resulted in employees with no ICT skills or knowledge tacking charge of ICT initiatives in the companies, which became a hindrance to ICT adoption and use.

Research has shown that when SMEs perceive, that they require specialized staff in order to adopt ICT, there is reluctance in adoption of the technology as they see it as a cost center and not an investment, in turn when the companies know that their employees have the skill and knowledge to use the technology and don't require further training, the company will be more willing and ready to adopt and use the technology (Reynolds, 1994). Other researchers such as MacGregor and bunker (1996) and Cragg and King (1993) found that employees and managers, of SMEs didn't have the needed knowledge and skill to utilize ICT even when these SMEs adopted them. This lack of skills may lead to low usage of the ICT system or application, and in turn the SME will not benefit from its adoption (Reynolds, 1994).

5.4 Conclusions

5.4.1 Perceived Usefulness of ICT and Adoption by SMEs

The study concluded that adoption of ICT by SMEs is influenced by many factors finding that perceived usefulness of ICT systems and applications enhanced the adoption process by SMEs of ICT systems and applications, also the study found that perceived improve

productivity, positively impact profitability, improve business processes and improve communication within the organization and with customers influenced the adoption behavior of the SMEs.

5.3.2 Perceived ease of use of ICT and Adoption by SMEs

The study established that perceived ease of use of ICT systems and applications enhanced the adoption process by SMEs of ICT systems and applications, also the study found that perceived reliable, accessible, available and user friendliness of the ICT system, Influenced the adoption behavior of the SMEs. This makes the SMEs receptive to adoption of the system as they are not intimidated by its adoption and use. Ease of use is shown to be a significant determinant of adoption and acceptance of ICT by SMEs.

5.4.3 Perceived cost of deploying ICT and Adoption by SMEs

From the study it was found that perceived cost of deploying ICT systems and applications influences the behavior of SMEs on adoption of ICT systems and applications, also the study found that when they have set budget for ICT development and when management see the value of ICT and avail funding for ICT projects it increases the rate of ICT adoption and acceptance by SMEs.

5.4.4 Owner, Management Support of ICT and Adoption by SMEs

The study concludes that Owner, management Support of ICT systems and applications influences the behavior of SMEs on adoption of ICT systems and applications. Also the study found that more SMEs are likely to adopt ICT when management views ICT as a strategic resource, when management allocate resources for ICT development, management reward employees for championing ICT innovation and when management encourages employees to be ICT champions.

5.4.5 Employee ICT knowledge and skill ICT and Adoption by SMEs

The study concluded that Employee ICT knowledge and skill of ICT systems and applications had no influence on adoption of ICT by SMES, thereby finding that there was no significant relationship between employee knowledge and skills of ICT and adoption of ICT by the SMEs.

5.5 Recommendations

5.5.1 Recommendation Increasing ICT adoption by SMEs

5.5.1.1 Improving Perceived Usefulness of ICT

The study recommends that the management of the companies which sell ICT systems and applications and offer support for these systems clearly show the impact of the systems on productivity, profitability, improved business processes and communication. From the study, adoption of ICT by SMEs is enhanced when the SME can easily perceive improved productivity, positive impact on profitability, improved business processes and improved communication within the organization and with customers when they adopt the ICT application.

5.5.1.2 Improving Perceived Ease of Use of ICT

The study also recommends that the management of companies that sell ICT systems and applications and offer support for these systems clearly demonstrate that the systems are reliable, accessible, available and user friendly. From the study SMEs would adopt ICT systems that they perceive to be reliable, accessible, user friendly and available.

5.5.1.3 Improving Perceived Cost of Deploying ICT

The study recommends that companies that are adopting ICT systems and applications should consider all cost centers, both tangible and intangible components of ICT implementations, as it will allow them to better create budgets of ICT initiatives and lower

the total cost of ownership. The study revealed that organizations that can manage their total cost of ownership lower the financial implication of ICT implementation and allows them to reap the benefits of ICT systems.

5.5.1.4 Improving Owner, Management Support of ICT

The study recommends that management of SMEs support ICT initiatives within the organization, this enhances the adoption of ICT by their companies. From the study more SMEs are likely to adopt ICT when management views ICT as a strategic resource, when management allocate resources for ICT development, management reward employees for championing ICT innovation and when management encourages employees to be ICT champions.

5.5.1.5 Improving Employee ICT Knowledge and Skill

The study also recommends that management of SMEs take into consideration their employees ICT knowledge and skills when they are making decisions on adoption of ICT systems and applications. The study showed that there was no significant relationship between employee knowledge and skills of ICT and adoption of ICT by the SMEs. These companies can benefit from employees who have ICT background in regards to implementation of ICT systems, these employees could aid in the smooth adoption and acceptance of new systems, champion system adoption and also be able to improve the quality of ICT systems adopted by helping these companies develop user requirements.

5.5.2 Recommendations further Study

Future research should focus on further testing and refinement of the new model to establish its external validity as well as testing whether the study findings results can be replicated in other contexts such as different technologies or economic sector. It is currently unknown how well the model and its findings will generalize beyond the specific conditions of this study. Future research should include a thorough testing of the proposed research model variables to determine whether the conceptual model proposed receives further empirical support.

Like most empirical research in a developing country, this research was limited by the small sample size of only 123 SMEs located with the capital city of Kenya, Nairobi. This is due to time and financial constraints. Most of the owners and managers of SMEs felt insecure divulging relevant information to us even with our assurance that such information is strictly for research purpose and will be treated with confidentiality. Future research needs to focus on a larger cross section and more diversified and larger random samples to verify the findings of this current study.

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APPENDIX 1: SAMPLE QUESTIONNAIRE

Academic Research Study on the Factors influencing ICT adoption and use by SMEs: Case of Nairobi based SMEs.

Dear Sir/Madam,

The purpose of this questionnaire is to collect user views on factors influencing ICT adoption by SMEs as part of my academic research study for the award of MBA at USIU-Africa. I appreciate your valued time in responding to the questions and assure you of confidentiality and privacy.

Andrew Paul Otieno.

Section one: General Information

Type of organization

- Sole proprietorship Partnership Limited liability company
 NGO Society Other, please specify_____

What industry is your company operating in:

- Manufacturing ICT Banking and Financial Services, Medical
 Education Hospitality If Other, Please specify_____

Years of operation

- 1-5 6- 10 11-15 16-20 over 20

Number of employees in your organization

- 1-10 11- 20 21-30 31-40 over 40

Annual revenue before ICT system deployed

- 100,000 – 2M 2M- 4M 4M-6M 6M-8M over 8M

Annual revenue after ICT systems Deployed

- 100,000 – 2M 2M- 4M 4M-6M 6M-8M over 8M

Section Two: Type of ICT system in use:

Does your organization have an ICT Department? Yes No

Does your organization have an ICT lead? Yes No

Does your organization have an ICT policy in place? Yes No

Does your organization have an ICT Strategic plan? Yes No

What types of ICT Systems are deployed in your organization?

- HR system Accounting System Customer relation Managing system
 Enterprise resource planner LAN Setup Billing Systems
 Data recovery systems Others, please specify _____

Section Three: Factors affecting

Adoption:

<i>Strongly disagree</i>	<i>Somewhat disagree</i>	<i>Neither agree nor disagree</i>	<i>Somewhat agree</i>	<i>Strongly agree</i>
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Perceived usefulness:

ICT systems deployed have improved productivity

ICT systems deployed have improved have had a positive impact on companies profitability

ICT systems deployed have improved work flow and improved business processes

ICT systems deployed have improved communication within the organization

ICT systems deployed have improved communication with customers

Ease of use

The ICT systems in your organization are always available

The ICT systems in your organization are easily assessable

The ICT systems in my organization are easy for employees to use in performing their duties

The ICT systems in my organization are reliable.

<i>Strongly disagree</i>	<i>Somewhat disagree</i>	<i>Neither agree nor disagree</i>	<i>Somewhat agree</i>	<i>Strongly agree</i>
--------------------------	--------------------------	-----------------------------------	-----------------------	-----------------------

Cost of Deploying

Your organization has a set ICT budget
ICT projects are easily funded in your organization

<i>Strongly disagree</i>	<i>Somewhat disagree</i>	<i>Neither agree nor disagree</i>	<i>Somewhat agree</i>	<i>Strongly agree</i>
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Owner top management support

Management views ICT as a strategic resource

Management allocates a budget for ICT development

Management support ICT projects the organization

Managements reward employees who use ICT to solve business problems

Management encourages employees to be ICT champions

Management encourages employees to get certification in ICT proficiency

<i>Strongly disagree</i>	<i>Somewhat disagree</i>	<i>Neither agree nor disagree</i>	<i>Somewhat agree</i>	<i>Strongly agree</i>
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Employee knowledge and skills

Employees in the organization easily adopt new ICT Systems deployed
 A number of employees have done basic training in IT (ICDL)

<i>Strongly disagree</i>	<i>Somewhat disagree</i>	<i>Neither agree nor disagree</i>	<i>Somewhat agree</i>	<i>Strongly agree</i>
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Employees in your organization are technology savvy
 A number of employees have a technical background in ICT.

APPENDIX 11: FIGURES

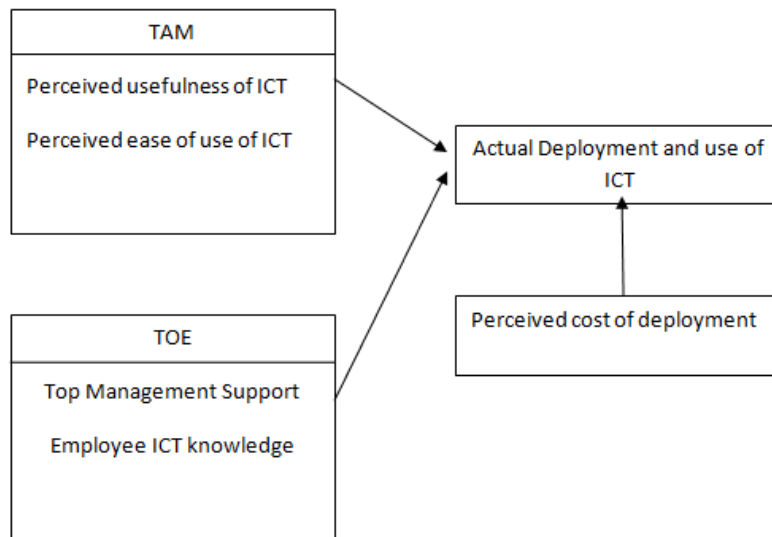


Figure 1: Proposed research Model (Authors Illustration)

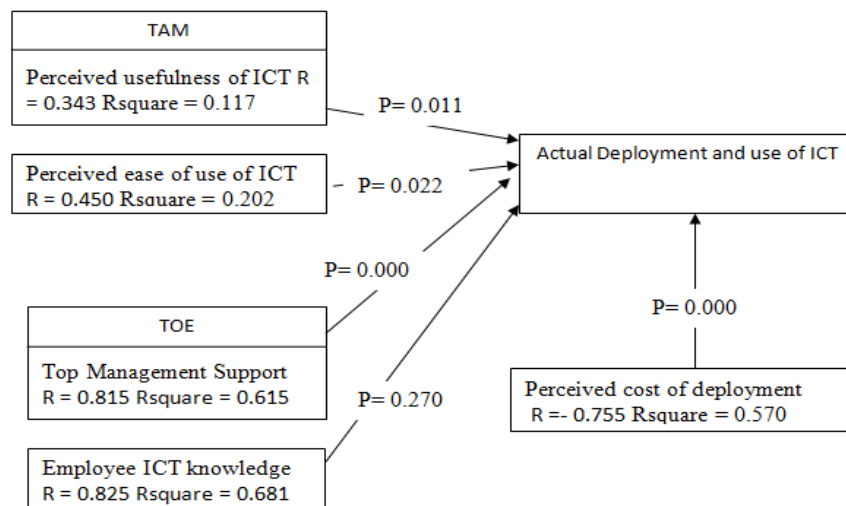


Figure 2 structural model

THANK YOU