

**ASSESSMENT OF ADOPTION OF INFORMATION AND COMMUNICATION
TECHNOLOGY AMONG SMALL AND MEDIUM-SIZED ENTERPRISES IN
THARAKA NITHI COUNTY, KENYA**

BY

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DECLARATION

This research project is my original work and has not been submitted for an award of any degree in any University

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DEDICATION

I dedicate this work to my wife Faith Kaari and daughter Norah, who supported me throughout this period and to my parents Mr. Romano Kanyaru and the Late Domenica Ciaacu for sending me to school having never seen a classroom door themselves.

TABLE OF CONTENTS

DECLARATION	2
ACKNOWLEDGMENT	3
DEDICATION	4
LIST OF FIGURES	9
LIST OF TABLES	10
ABBREVIATIONS AND ACRONYMS	11
OPERATIONAL DEFINITION OF TERMS	12
ABSTRACT	13
CHAPTER ONE	14
INTRODUCTION	14
1.1. Background of the Study	14
1.1.1. Small and Medium-Sized Enterprises in Tharaka Nithi County	17
1.2. Statement of the Problem	18
1.3. Objectives of the Study	Error! Bookmark not defined.
1.3.1. General Objective	20
1.3.2. Specific Objectives	20
1.4. Research Questions	21
1.5. Significance of the Study	21
1.6. Scope of the study	22
1.7. Assumptions of the Study.....	23
1.8. Limitations of the Study	23
1.9. Organization of the Study.....	23

CHAPTER TWO	24
LITERATURE REVIEW	24
2.1. Introduction	24
2.2. Theoretical Review	24
2.2.1. Technology Acceptance Model (TAM)	24
2.2.2. Technology, Organisation and Environment Model.....	25
2.2.3. Theory of Reasoned Action.....	26
2.3. Empirical Review.....	27
2.3.1. ICT Security	28
2.3.2. ICT Infrastructure	29
2.3.3. Management Support	31
2.3.4. Employee ICT Skills.....	32
2.4. Summary of Literature Review and Research Gaps	33
2.5. Conceptual Framework	34
CHAPTER THREE	36
RESEARCH METHODOLOGY	36
3.1. Introduction	36
3.2. Research Design	36
3.3. Target Population.....	36
3.4. Sampling and Sample Size	37
3.5. Data Collection Instruments	38
3.5.1. Validity of Instrument	40
3.5.2. Reliability of Instrument	40

3.6. Data Collection Procedure.....	40
3.7. Data Analysis and Presentation	41
3.8. Ethical Considerations	42
CHAPTER FOUR.....	43
RESEARCH FINDINGS AND DISCUSSIONS	43
4.1. Introduction	43
4.2. Response Rate	43
4.3. Background Information	44
4.3.1. The Age of the Respondents	44
4.3.2. The Gender of the Respondents	45
4.3.3: The Education Level of Respodents.....	46
4.3.4. Number of years respondents had worked in the organisation	47
4.3.5: Business Category.....	48
4.3.6. Validity of the Instrument.....	49
4.3.7. Reliability Test	49
4.4. Descriptive statistics	50
4.4.1. ICT Security.....	50
4.4.2. ICT Infrastructure.....	53
4.4.3. Management Support.....	55
4.4.4. Employee ICT Skills	57
4.3.5. Adoption of ICT	59
4.5. Regression analysis.....	61
CHAPTER FIVE.....	65

SUMMARY, CONCLUSION AND RECOMMENDATIONS.	65
5.1. Introduction.	65
5.2: Summary	66
5.3. Conclusion.....	68
5.4. Recommendations.....	69
5.5. Suggestion for Further Research	69
REFERENCES.....	70
APPENDICES.....	76
Appendix I: Introduction Letter	76
Appendix II: Survey Questionnaire.....	77

LIST OF FIGURES

Figure 2.1: Conceptual Framework.....	21
Figure 4.1: Response Rate.....	30

LIST OF TABLES

Table 3.1: Target Population and Sample Size.....	24
Table 4.1: Age of Respondents.....	30
Table 4.2: Gender of Respondents.....	31
Table 4.3: Education Level of Respondents.....	32
Table 4.4: Number of Years Respondent had Worked in the Organisation.....	33
Table 4.5: Business Category.....	34
Table 4.6: Reliability Test.....	35
Table 4.7: ICT Security.....	37
Table 4.8: ICT Security as a Serious Threat	38
Table 4.9: ICT Infrastructure.....	39
Table 4.10: Management Support.....	41
Table 4.11: Employee ICT Skills.....	43
Table 4.12: Adoption of ICT.....	45
Table 4.13: Model Summary.....	47
Table 4.14: ANOVA Table.....	47
Table 4.15: Regression Coefficients.....	48

ABBREVIATIONS AND ACRONYMS

GOK: Government of Kenya

ICT: Information and communication technology

SME: Small and Medium Scale Enterprises

SPSS: Statistical Package for Social Sciences

OPERATIONAL DEFINITION OF TERMS

Adoption of ICT:-	This is the dependent variable with attributes; technology use in transactions and use of computers in administration operations
Employee ICT Skills:-	The independent variable with attributes: Competence, experience and Training level
ICT Information Security:-	This is the independent variable with the following attributes: information theft, viruses, worms, Trojans, hackers and insider job threats
ICT infrastructure:-	The independent variable with the following attributes: Hardware and software, databases, networks and internet
Information and Communication Technology (ICT):-	A range of technologies that include communication devices and applications. It includes stand-alone softwares like Ms Office to sophisticated ones like ERP. It also encompasses devices like computers, cellular phones, TVs and satellites
Management Support:-	This is the independent variable with the following attributes: monitoring, staff training, strategic planning and allocation of resources
Medium Enterprises:-	They are enterprises consisting of 51- 100 employees
Small and Medium-sized Enterprises:-	This is a business enterprise that has a given limit of employees
Small Enterprises:-	They are consisting of 11 -50 employees

ABSTRACT

The advent of 20th century has seen many organisations embrace the use of technology to enhance performance. Research has indicated that ICT is a driver for any firm to achieve its goals. ICT has been on the forefront in enhancing globalisation of services and organisation's functions. Various inventions have been made in the ICT field and this has helped organisations to fasten their service delivery. Although the uptake of ICT among SMES in developed countries has been cited to be around forty eight percent, the ICT adoption rate among SMES in developing country is still low averaging at around fifteen percent. The purpose of this study is to investigate the factors that affect ICT adoption among SMEs in Tharaka Nithi County, Kenya. Specifically, the study sought to investigate the impact of ICT information security, ICT infrastructure, management support and employee ICT skills on the adoption of ICT among SMEs. The research utilised descriptive design and was limited to a population of 1700 SMEs in Tharaka Nithi County. The study adopted a stratified random sampling where the population was grouped into stratus according to sectors that SMEs belong to. The study utilised a formula that was proposed by Mugenda and Mugenda where ten percent of SMEs was taken from each stratum and their manager used as a respondent to constitute a study sample size of 170 respondents. In this regard, the respondents were the managers of these SMEs. The study utilised primary data that was gathered using semi-structured questionnaire that contained open as well as closed-ended questions. Content validity of the data collection instrument was assessed by the researcher and the supervisor reviewing the items and adopting it from a similar study. On the other hand, the reliability was assessed by use of Chronbach's alpha coefficient test. The investigator administered questionnaires to the respondents and in cases where the respondent was not available, drop and pick later method was adopted. The study used inferential and descriptive statistics in the analysis of the data, which included mean, standard deviation and distribution tables. The presentation of the results was done in various forms, including charts, graphs, and tables. The findings of the study indicated that the independent variables (ICT information security, ICT infrastructure, and management support and employee ICT skills) were significant and that there was an association between them and ICT adoption (the dependent variable). The value of adjusted R squared in the final model (0.801) shows that the 80.1 percent of variation of the adoption of ICT can be explained by the combination of the four variables. The research established that there was a significant effect of ICT security, ICT infrastructure, management support and employee ICT skills on ICT adoption by SMEs. Both empirical and statistical evidence proved that a relationship existed between these variables and ICT adoption by SMEs. The study recommends that county governments and management should support ICT adoption by SMEs, as well as the central government implement policies and laws that enhance ICT security.

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

The adoption of information and communication technology (ICT) by small and medium-sized enterprises (SMEs) is important as it is considered as a way of enabling the business to compete globally, improve efficiency, as well as, develop closer relationships between the business and its customers (Anoop, Ajjan, & Ashok, 2015). According to Ghobakhloo, Arias-Aranda, and Benitez-Amado (2011), the current business world is being overly affected by ICT, and therefore, its adoption by SMEs would increase their competitive advantage. Thus, it is agreeable that SMEs need to consider adopting ICT so as to take advantage of competitiveness in the globalized market.

Currently, ICT adoption is rapidly changing the business models of enterprises, production processes, and consumption patterns. Thus, adoption of ICT has a critical role in helping to generate business opportunities as well as to deal with competition pressures. A few decades ago, information and communication technology (ICT) was limited to information technology industry, system engineers, and information technology managers. This has changed significantly as of late ICT has become a vital part of mainstream business. ICT is currently utilised in almost all business and government functions and the number of organisations that are adopting ICT are on the increase. Therefore, ICT is no longer a subsection of an organisation, but it is among the main components that support the functioning of an SME. Adoption of ICT has been found to introduce numerous benefits for an SME. The increasing level of demand for ICT products in Kenya demonstrates the levels of infiltration of ICT in Kenya. The benefits associated with the adoption of information

technology include reduced costs, increased efficiency, reduced errors, and time saving (Alam, Ali & Jani, 2011).

Thulani, Tofara and Langton(2010) argue that adoption of ICT is one of the tools that can drive an SME towards achievement of its goals. According to Mitchel (2012), ICT is a driver for any SME to achieve its goals. The authors further argue that ICT has enabled to flatten organisations thus eliminating bureaucracy, enhanced communication both internal and external, and automated processes thus enhancing efficiency. ICT technology has been on the forefront in enhancing globalisation of services and organisation's functions. Various inventions have been made in the ICT field and this has helped SMEs to fasten their service delivery. Thulani et al (2010) posits that almost 100% of SMEs in UK and USA have embraced ICT in their dealings. Thulani et al(2010) further argue that this has majorly helped these SMEs improve their performance. Further, he indicates that there is 79% probability of an SME that has embraced technology to be more competitive than those that have given ICT a blind eye. Therefore, ICT has been instrumental in many firms across the world. ICT has made functions and service delivery faster and even made working easier. Clients can now be served from their comfort of their homes. According to Oyelaran-Oyeyinka and Adeya (2010), ICT has the potential to enhance communication within an entity, and thus providing better and efficient way to manage people and resources. In addition, ICT applications like ERP provide an SME with a viable platform to store and manage acquired business knowledge.

There are innumerable studies done in other countries to assess ICT adoption by SMEs. Ina research done by Apulu, Latham, and Moreton (2013) in Lagos, Nigeria, various factors were identified that affected the ICT use and adoption by SMEs in the region. The researchers indicated that user ICT skills, management support, information security, cost of equipments,

infrastructure and government policy are a number of the major factors, which influenced ICT adoption. The research showed that although there were numerous benefits linked to ICT adoption, many SMEs in Lagos still had not adopted ICT at the time of their research. In another research done in Jordan, Al-Shboul, Rababah, Al-Shboul, Ghnemat, and Al-Saqqa (2014) agreed with the earlier study done by Apulu et al (2013) that ICT adoption by SMEs is affected by various factors, including user skills, management support and cost of ICT equipments. Further, Al-Shboul et al (2014) pointed out that several other factors influence ICT adoption and research should not only be restricted to the only mentioned factors. In Ghana, Obiri-Yeboah, Owusu, Kyere-Djan (2013) examined factors affecting ICT adoption in tertiary institutions. They found that employee attitudes, lack of administration support, resistance to change and information security fears constitute factors that affect adoption of ICT in organisations. They further argued that cost of ICT equipments and government policy are also factors that affect adoption of ICT. Obiri-Yeboah et al (2013) reviewed literature from various developing countries with respect to the adoption of ICT.

According to various researches, SMEs have faced a number of challenges ranging from neglects and poor public image as well as aggravation from government agencies and authorities in their quest to adopt and use ICT. However, in the recent past, the government has been in the forefront in availing funds and policies to boost SMEs developments and growth and an example of this is UWEZO fund (Gikenye, 2014). However, most of the activities of SMEs are still vulnerable due to being self-reliant and thus they lack sufficient funds to invest in robust ICT policies and infrastructure to boost their ICT adoption chances. Therefore, due to lack of a robust ICT framework, most SMEs continue lagging behind in terms of productivity, profitability and general performance (Apulu, 2012). Owing to the importance of ICT incorporation in any business, SMEs' lack of enough funds, information, skills and interest in the ICT innovations continues to keep the income and profits of these

SMEs low and thus making them unable to fight the competition in the market and thus are not able to grow and become large and global organisations (Djatikusumo, 2014).

A research done by Pelgrum (2010) on sample of schools from twenty six countries showed that ICT adoption obstacles are many and prevalent thus making ICT adoption difficult. Pelgrum indicated that poor ICT infrastructure, lack of expertise and skills in employees, fears of information security, lack of management support among others are specific impediments to ICT adoption by many SMEs. Additionally, Anoop, Ajjan and Ashok (2015) in their study conducted at Kerala-India, posit that inadequate skills, lack of management support, and lack of interest among others have hindered the adoption of ICT among SMEs. Further, Kwacha (2007) in his study conducted in Nigeria argues that some of the common constraints that have blocked the full adoption of ICT by SMEs are lack of proper skilled personnel, high cost of implementation and maintenance, poor attitude of management, poor and sometimes lack of power supply especially in rural areas. With the world moving towards improved integration due to advancements in ICT technology, SMEs will derive particular opportunities from ICT adoption and their capability to be involved in international and regional markets. Therefore, it is startling that evidence from previous literature show a slow response to ICT adoption. The expectations that SMEs would adopt ICT and progress like big firms have not been achieved yet (Oyelaran-Oyeyinka & Adey, 2010).

1.1.1. Small and Medium-Sized Enterprises in Tharaka Nithi County

SMEs have received credit for their contribution in the development and growth of numerous economies in the world (Thulani et al., 2010). Studies have shown that the role of SMEs in economic growth of countries especially in developing countries of Africa cannot be underestimated. According to Thulani et al (2010), SMEs represent over 50% of all employment opportunities and business enterprises in developed countries. A large number of

studies in Africa on SMEs have also shown that they have created a large number of employment opportunities.

There are more than a thousand SMEs in Tharaka Nithi County. These SMEs are spread across the county both in major towns and market places (Waweru & Wangechi, 2015). Some of the major towns that host SMEs include Chogoria, Chuka, Kathwana and Marimanti. Other market places that SMEs are situated include Gatunga, Mukothima, and Nkondi. The SMEs in this county operate in various sectors including health, hotel, entertainment and computer and electronics. However, majority of the SMEs are in the traditional sectors of Hotel and Food sector (31%), computer and technology (16%), real estate (15%) and entertainment (9%). The SMEs in the county face almost similar challenges to other SMEs in other parts of the world. In order to prepare for the global market and avert competition, SMEs in Tharaka Nithi County continually engage in activities that improve their efficiency and performance (Wangechi & Waweru, 2015). Although a few SMEs in this county have adopted ICT, majority of them have not yet adopted ICT. Owing to the numerous benefits related to the adoption and utilization of ICT, challenges such as poor ICT infrastructure in the county may have affected adoption and utilisation of ICT by SMEs.

1.2. Statement of the Problem

Recent studies including the one done by Anoop, Ajjan, and Ashok (2015) have indicated that ICT adoption has various benefits. However, most studies have focussed on enterprises in developed economies. The high level of dynamism between economic environment in developed and developing countries limits the applicability of adoption of ICT in organisations in developed and in developing economies. Other studies have further indicated that the adoption rate of ICT in enterprises that operate in developed countries is higher than that in developing countries (Antlova, 2013; Chairael, Widyarto, & Pujani, 2015).

Various studies including a study done by Mokaya (2012) have indicated that despite SMEs being the backbone of growth in the global context, ICT adoption and utilization by SMEs in Kenya is low and thus cannot cope with competition from larger organisations in delivering services. More so, ICT adoption has been documented largely based on benefits, growth and constraints by many researchers.

Research has shown that SMEs in developing economies have no choice, but to adopt and use ICT in their functions. There has been frequent calls for ICT adoption as well as integration by SMEs in Kenya so as to enable achieve vision 2030 (Government of Kenya, 2007). According to Ardjouman (2014), managers of SMEs are central to ICT adoption and utilization. It is paramount in this case to investigate the barriers hindering ICT adoption and utilization by SMEs. In studies done in the UK, Netherlands, and South Africa, there was an indication that owners of SMEs require facilities, funds and infrastructure in order to be able to optimise ICT adoption and utilization in the administration of SMEs. On this note, the application of ICT in the management of SMEs is a way of modernising the management and improving the performance of these SMEs.

In spite of the importance placed on the SMEs' ICT adoption and utilization in their daily activities, a research done by Ardjouman (2014) indicated that a majority of SMEs in developing countries have not adopted ICT in their activities. Although many countries in Africa have an adoption rate of ICT at 48% among SMEs, the Kenyan rate of ICT adoption and utilization remains low with only an average of 15% adopting ICT (Nduati, Ombui, & Kagiri, 2015). They argue that though there are numerous benefits of ICT adoption by SMEs, there has been little or no ICT adoption by SMEs in developing countries especially Kenya. The ICT adoption rate by SMEs in Kenya is therefore, comparatively low at 15%.

Despite the importance placed on ICT, a report by the ICT department of Tharaka Nithi County Government showed that out of over 1700 SMEs in the county, less than 14% have adopted ICT (ICT Department, 2016). This scenario shows that the adoption level of ICT by SMEs in the county is still low, and therefore, there must be a reason why the adoption rate has remained low. Based on this background, this study sought to investigate the factors that influence ICT adoption by SMEs in Tharaka-Nithi County, Kenya.

1.3. Research Objectives

1.3.1. General Objective

To examine the factors affecting the adoption of information and communication technology among small and medium-sized enterprises in Tharaka-Nithi County, Kenya

1.3.2. Specific Objectives

This study was guided by the following specific objectives:

- i. To establish the effect of ICT security on the adoption of ICT among SMEs in Tharaka-Nithi County, Kenya
- ii. To assess how ICT infrastructure affect the adoption of ICT among SMEs in Tharaka-Nithi County, Kenya
- iii. To determine the effect of management support on the adoption of ICT among SMEs in Tharaka-Nithi County, Kenya
- iv. To evaluate the effect of employee ICT skills on the adoption of ICT among SMEs Tharaka-Nithi County, Kenya

1.4. Research Questions

The study aimed at answering the following research questions.

- i. What is the impact of ICT security on the adoption of ICT among SMEs Tharaka-Nithi County, Kenya?
- ii. What is the influence of infrastructure on ICT adoption among SMEs in Tharaka-Nithi County, Kenya?
- iii. How does management support influence ICT adoption among SMEs in Tharaka-Nithi County, Kenya?
- iv. How do employee ICT skills influence ICT adoption among SMEs in Tharaka-Nithi County, Kenya?

1.5. Significance of the Study

Firstly, the results of this research study will be significant to the running of SMEs in Tharaka Nithi County as it will offer the barriers to adoption and use of ICT to improve performance. Using such information, managers of SMEs in Tharaka Nithi County will be able to formulate policies that facilitate ICT growth and integration into their operations. Moreover, this study is significant to all the leadership of SMEs in Kenya that are involved in initiatives aimed at introducing ICT in their operations as well as those that are focused in expanding the scope of ICT applications in their operations. The findings of this research will assist managers of SMEs in Tharaka-Nithi County to achieve success in transitioning their SMEs from conventional to ICT-based service delivery through providing viable solutions to the current barriers to adoption and utilization of ICT.

This research will contribute to theory, practice, and policy. This study is an effort towards developing a better understanding of ICT benefits and the barriers to adoption in SMEs with specific focus on Tharaka Nithi County. Therefore, this study will be of benefit to ICT adoption by SMEs in Tharaka Nithi County to improve their performance. Moreover, this research study is among the limited empirical investigations into ICT adoption and utilization by SMEs in counties in Kenya. This study therefore enriches the existing literature on the adoption of innovations by concentrating on ICT to enhance the current knowledge about and understanding of the processes that are used by SMEs in ICT adoption. This study will also enrich theory via evaluating the applicability of various theories related to the adoption of innovations that were developed based on studies conducted in the Western world to explore an issue in sub-Saharan Africa. More so, this study is of significance to theory because it will be founded on a comprehensive conceptual framework, which incorporates factors from varied theoretical views to present an all-inclusive view point of ICT adoption barriers in SMEs in Kenya.

1.6. Scope of the study

This study examined the factors affecting ICT adoption by SMEs in Tharaka Nithi County, Kenya. These factors are ICT information security, ICT infrastructure, management support and employee ICT skills. The study was confined to Tharaka Nithi County geographic region where the target population will be 1700 SMEs. The researcher targeted the SMEs that were situated at Chogoria town, Chuka, Kathwana, Marimanti, Gatunga, Mukothima and Nkondi market due to transport logistics at the time of this research.

1.7. Assumptions of the Study

The assumption of this research is that the sampled respondents provided truthful and honest responses.

1.8. Limitations of the Study

The researcher sometimes failed to get the correct respondent to give the required information. However, the researcher in this case dropped the questionnaire and picked later when the respondent filled it. In cases where the respondents were unwilling to provide the required information, the researcher instilled confidence on the respondents as well as assured them of confidentiality of all the information they gave.

1.9. Organization of the Study

This research is structured into five chapters where chapter one discusses the background of the study, the statement of the problem, objectives of the study, significance of the study, limitations and research questions. Next, chapter two reviews the previous literature. This chapter presents both the theoretical review, and the empirical review in relation to the objectives and variables of this study. Additionally, the chapter gives the conceptual framework that illustrates the associations between the dependent and independent variables. Chapter three presents the research methodology adopted by the researcher. The chapter provides a description of the sample size, target population, research design, sampling technique, instrument utilized in data collection, methods of data collection, and the technique of analyzing the data. Chapter four presents data analysis, discussion and presentation. Lastly, chapter five provides conclusions, summary of results, and the study's recommendations

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

This chapter offers insights into the literature related to the issues of ICT adoption among SMEs. The chapter will review theories that underpin the study as well as present an empirical review of the variables of the study.

2.2. Theoretical Review

As a technological innovation, ICT adoption can be explained using theoretical frameworks. Therefore, it is essential to describe an overview of the theories that will guide the investigation of the barriers to ICT adoption and use by SMEs in Tharaka Nithi County, Kenya. Various theories are utilised in explaining innovation adoption in organisations including the technology acceptance model, theory of reasoned action, and technology-organisation-environment framework.

2.2.1. Technology Acceptance Model (TAM)

This theory elucidates processes related to the adoption/acceptance and utilization of technological infrastructure by users. This theory proposes that following the presentation of

a new technology to a user, various factors affect the user's decision related to when and how to utilize the technology, including its perceived usefulness as well as perceived ease of use. Davis (2009) argues that perceived ease of use of an ICT infrastructure directly impacts its perceived usefulness, determines the attitude of the consumer towards utilization, and results in behavioural intent to utilize the technology, and the actual utilization of the technology. Therefore, this model is a useful model for this research paper because it gives an overview of ICT adoption as well as the consumers' perception of the technology. Research has indicated that ICT adoption is influenced by various factors, such as infrastructure and employee skills. Ghobakhloo, Hong, Sabouri and Zulkifli (2012) argued that in organisations that have limited resources, adoption of ICT is unlikely because they may not have resource power to lay down the infrastructure requirement for ICT adoption. Regarding this, it is in order to argue that management of such organisations may therefore fail to adopt ICT. Ghobakhloo et al (2012) further stated that in many organisations with employees who are not computer literates, acceptance of ICT may be resisted by such employees. This model is therefore important to this study as it explains how ICT infrastructure and employee skills may influence ICT adoption and its acceptance in SMEs.

2.2.2. Technology, Organisation and Environment Model

This theory emphasises external and internal characteristics of organisation as influencing organizations to adopt technology. It constitutes the environment situation that covers both opportunities and constraints to organisations in technology implementation. The theory posits that organisation factors, including informal and formal linking communication processes and structures within the organisation affect the readiness to implement technology. Additionally, environmental factors, such as technology support infrastructures and governmental regulations determine the swiftness of technology adoption by enterprises. The

availability of technology and cost affects the way technology is implemented by enterprises (Rahman, Almoawi, & Mahmood, 2011). This theory was considered to be most applicable to the proposed study because it highlights the major issues that this research study intends to explore (Oliveira & Martins, 2011). Research has shown that many enterprises are afraid of adopting ICT because of the security threats to the information. Bearing in mind that organisations do not operate in a vacuum, there is a serious threat to sensitive data that can bring down the entire enterprise. Most recently, it was reported that the servers of National Youth Service were hacked and irregular payments done (Picoto, Bélanger, & Reis, 2014). This is a real case that explains the background of this theory and the subsequent fear of SMEs in adopting ICT in their functions. Therefore, this theory has indicated that the internal as well as external environment of an organisation may hinder the adoption of ICT due to government policy, poor infrastructure and cost of securing information systems. As such, the theory will help to assess the effect of information security and ICT infrastructure on ICT adoption by the SMEs in Tharaka Nithi County.

2.2.3. Theory of Reasoned Action

This theoretical model has been utilized in providing descriptions of the psychological processes behind the conscious behaviour of people by explaining behavioural determinants. This model argues that an individual's behavioural intent affects the performance of a behaviour. The key factors determining an individual's behavioural intent include the attitudes towards the behaviour and the subjective norms associated with that behaviour (Alkailani & Kumar, 2011). Behavioural intention refers to degree to which an individual has the willingness to try and the quantity of effort planned to be exerted in performing the behaviour. This model contends that an individual's behavioural intention positively influences behavioural performance.

An individual's subjective norms are influenced by normative beliefs concerning the practicality of that behaviour, as assessed by referent individuals, and the inclination to adhere to those beliefs. This theory also presumes that external factors, including an individual's characteristics have an indirect influence on their behaviour by influencing the attitudes and subjective norms. In line with this theory, individuals who view that performing a behaviour will lead to positive outcomes, will have a positive attitude towards that behavioural performance. However, individuals who view negative outcomes from performing the behaviour are highly likely to have negative attitudes towards behavioural performance. From the perspective of information technology, this theoretical model theorises an individual's subjective norms and attitude mediates the effect of external variables on an individual's intent to utilize information technologies. One would argue that this theory well explains the technological factors as a determinant of ICT adoption. From the perspective of management, the theory suggests that cost of the technology, relative advantage as well as risks associated with the adoption of ICT is considered. Therefore, this theory will help in explaining the effect of technological factors on the adoption of ICT by SMEs Tharaka Nithi County.

Even though researchers have found this theory's capability of this theory in envisaging individuals' behaviour to implement technologies, the theory is criticised for its failure to elucidate behaviours beyond the individuals' control (Alam et al., 2011). This is associated with the view that the theory concentrates on elucidating individuals' voluntary and volition behaviours.

2.3. Empirical Review

This section will discuss various studies that have discussed various factors affection adoption of ICT including ICT information security, ICT infrastructure, management support

and employee ICT skills. The various studies that have discussed these factors will be reviewed in this section.

2.3.1. ICT Adoption

According to various studies including the one done by Chairuel, Widyarto, and Pujani (2015), adoption of ICT has been found to introduce numerous benefits for an organisation. The increasing level of demand for information and communication technological products in Kenya demonstrates the levels of infiltration of ICT in Kenya. The benefits associated with the adoption of information technology include reduced costs, increased efficiency, reduced errors, and access to new operational technology (Alam, Ali & Jani, 2011). Information communication technology plays an important role in the functioning of an organisation. The use of ICT at organisational level range from personal to mainframe computers, simple applications such as word processors to sophisticated systems that play an important role in organisations (Ghobakhloo *et al.*, 2011). Recent research has established some of the factors that affect ICT adoption by SMEs, which include ICT security, ICT infrastructure, management support and employee ICT skills (Alam *et al.*, 2011). A research done by Ardjouman (2014) indicated that most SMEs in developing countries have not adopted ICT. Further, Nduati *et al* (2015), in their research showed that the adoption rate of ICT in Kenyan SMEs remained low at only 15%.

2.3.2. ICT Security and ICT Adoption

Research indicates that the use and integration of ICT into business or any entity has revolutionised the way things are normally done. These types of changes that must affect the corporate culture of doing things are not easy to be implemented. Researchers say that it can take several years before a simple technology is accepted. There has been argument and

rightly so, that the use of ICT has adverse effects when it comes to information security (Featherman, Miyazak, & Sprott, 2010). Additionally, it has been argued that most corporate management are fearful of these security threats (Featherman et al., 2010). It is noted that ICT ranges from technologies that can be implemented as standalone systems to those that are shared over a network. The issue of viruses, worms, eavesdropping and information theft is what has been seen as holding most SMEs back. A study conducted by Oyelaran-Oyeyinka and Adeya (2010) indicated that most financial banks in Kenya had lost money to fraudsters worth 100 billion. This leaves a question of how then will the SMEs be secure with the ICT technology implemented. The authors also indicated that the destruction of sensitive information or disclosure of sensitive information is also a serious threat that has impeded adoption of ICT in many SMEs in Kenya (Oyelaran-Oyeyinka & Adeya, 2010).

According to Sarkar (2010), deliberate actions by people whether insiders or outsiders, pose a serious security threat to the information of an enterprise. Sarkar notes that although some of these actions may be accidental, the damage can be detrimental. Sarkar gives a case where an employee accidentally deletes an important data or an outsider gains access to the enterprise sensitive information through malicious actions. He argues that these actions could see the downfall of the organisation. More so, other problems could be purely malfunctioning of the systems, which could cause real havoc in the enterprise running of daily activities. Some of these can be hardware failure, system crashing, software proms like bugs (Kannabiran & Dharmalingam, 2012).

2.3.3. ICT Infrastructure and ICT Adoption

Beckinsale, Ram, and Theodorakopoulos (2010) described ICT infrastructure as the facilitating foundation of information technology capabilities that are shared and depended on by businesses. They perceived ICT infrastructure as the part of the ICT architecture that is

shared. Madsen (2010) describe ICT infrastructure as the technological foundation of basic, data, communications, and computer systems. Madsen (2010) perceives ICT infrastructure as the technology structure guiding the organisation to satisfy its management and business needs. Duffy (2010) describes the ICT infrastructure as the set of IT resources, which ensure the feasibility of innovations and the ongoing enhancements of IT systems.

Although it is typically claimed that ICT investments are cost-effective, and the ongoing decline in the prices of ICT, the whole costs of ICT possession, including skill acquisition, development, maintenance, upgrading, hardware, and software is still high (Oyelaran-Oyeyinka & Adeya, 2010). Investment in ICT for enterprises may be viewed as an added cost, and supporting considerable implementation of ICT implementation is a challenge that many organizations and systems in developing countries experience. Research has indicated that many enterprises even in developed countries have had problems adopting ICT because of the cost of hardware, software infrastructure (Duncan, 2010).

Resource constraints are recognized as barriers to ICT adoption. The technological, financial, and human resources are critical to new technology adoption. The large organisations commonly have the resources and infrastructure for facilitating new technology implementation. Conversely, the smaller enterprises are incapable to implement the ICT since due to the lack of resources (Alamro & Tarawneh, 2011). With regard to small enterprises, the leadership might view implementing ICT as being vital but they might lack adequate resources to adopt the technologies. Because cultural, structural, human, and technological factors are critical to facilitating ICT adoption, the insufficiency of such resources causes difficulties for governments to adopt the new technologies. Unlike the larger organisations, SMEs have encountered challenges in trying to obtain finances to lay down the infrastructure required (Kim, Xu & Gupta, 2012). Masoud (2012) identifies cost increment related to

adoption as one of the obstacles to ICT adoption. Additionally, Mokaya (2012) showed that the costs of ICT adoption are commonly regarded as being very high by SMEs. Specific costs related to ICT adoption includes; acquiring technological equipment, and the costs associated with the development of information platforms.

2.3.4. Management Support and ICT Adoption

Effective leadership positively influences ICT implementation in institutions and systems. As crucial leaders of organisational transformation, organisational leaders can enable and support ICT implementation in their organisations. To attain this, organisational leaders have to acknowledge that, the notion of ICT implementation is about ICT utilization and also the transformation of organisational operations and management (Erumban& De Jong, 2010).

The management's level of ICT knowledge coupled with positive attitude to ICT increases the level of ICT adoption as suggested by Harrigan et al (2010). Consequently, this is not the case as the owners of SMEs who most of the times double as the senior managers have little knowledge of ICT which is a serious barrier to its adoption. According to Zaid (2011), management of SMEs shy away from investing in various ICT technologies as well as training their staff on matters of ICT. He argues that most of the managers fear takeover of their positions by subordinate staff. Although infrastructure, employee skills and security have been cited as the most important factors influencing ICT adoption by SMEs, support by the top management is paramount as they are central to decision-making in these enterprises. A manager who accepts and uses technology in his/her daily running of the organisation is likely to influence the employees he/she manages to use similar technology on their work (Zaid, 2011).

2.3.5. Employee ICT Skills and ICT Adoption

The literature recognises the lack of knowledge and awareness on the adoption of technology as one of the important obstacles to its adoption. SMEs such as those in Kenya lack technology-qualified personnel for spearheading ICT adoption (Bagchi & Udo, 2010). Employees' knowledge concerning ICT is positively associated with the SME's ICT adoption (Apulu & Ige, 2011). Research has shown that if employees perceive ICT as either fulfilling their own requirements or those of their customers, their likelihood of accepting it in their organization is high (Apulu, Latham, & Moreton, 2011). On a similar note, Ongori and Migiro (2011) also cited employees' lack of proficient ICT skills as being one of the relevant hindrances in the acceptance of ICT in SMEs globally.

Research suggests employee's skills, adequacy, beliefs, and attitudes affect successful adoption of ICT in enterprises. This is attributed to the necessity of changes in the employees' qualifications and workplace attitudes during the adoption of new technologies. It also requires changes in employees' degree of knowledge on the ICT technology itself and performance levels. In a study conducted at ICT Centre in Iran, the findings established that the slow or lack of adoption of ICT is associated with the lack of cognizance concerning the opportunities or advantages provided by ICT adoption (Khalil Moghaddam & Khatoun-Abadi, 2013). The authors also point out to poor ICT skills in employees that hinder adoption of ICT as they fear being phased out. Further, Khalil et al (2013) clearly state that employees' knowledge and their readiness to utilize ICT technologies influence its adoption.

The literature also recognizes the deficiency of technology-qualified personnel as one of the barriers to ICT adoption. The rapid pace associated with technology development is an implication that enterprises need new personnel, and this is a relevant obstacle to ICT adoption (Costello, Jackson, & Moreton, 2013). They argue that one of the key reasons for the

failure of small organisations to adopt ICT is the lack of internal expertise. Most SMEs have been stuck in their initiatives to implement the ICT or other new technologies, pending the acquisition of adequate internal expertise. Thus, when an organization's employees possess certain knowledge on ICT, the SME is better positioned to implement ICT. In their study, Costello et al (2013) attribute the unhurried pace of ICT adoption to the deficiency of technical resources and expertise for ICT implementation. Further, they posit that the deficiency of technical ICT knowledge and skills among the employees has considerably influenced ICT adoption. According to (Chairoel, Widyarto, & Pujani, 2015), the difficulties faced by many enterprises in getting the qualified persons with the requisite skills and knowledge as well as the possibility of dissipation of the particular knowledge of the organisation is a considerable challenge to ICT adoption.

2.4. Summary of Literature Review and Research Gaps

This section has reviewed various theories that underpin the research study. In particular, technology acceptance model, theory of reasoned action and technology-organisation-environment framework have been reviewed. More so, this section has given a summary of the several factors affecting the ICT adoption among SMEs. These factors are ICT information security, Employee ICT Skills, ICT infrastructure, and Management support. Each of these variables will be summarised and aligned to the subject of the study. The literature has shown that most of the studies on the adoption of ICT have been focussed on developed countries, whereas research in developing countries on factors affecting ICT adoption are still limited by the time of this study. This study will try to appraise these factors from the perspective of ICT adoption by SMEs, and therefore, the study will fill this gap by positioning these determinants that influence ICT adoption among SMEs in Tharaka Nithi County. This will be essential in enriching and incorporating the missing literature.

2.5. Conceptual Framework

The conceptual framework gives a clear understanding and holistic view of the independent variables that affect ICT adoption by SMEs in Tharaka-Nithi County as discussed in the empirical review section. These variables are ICT information security, Employees ICT skills, Management support, and ICT infrastructure. The dependent variable of the study was adoption of ICT.

Independent variables

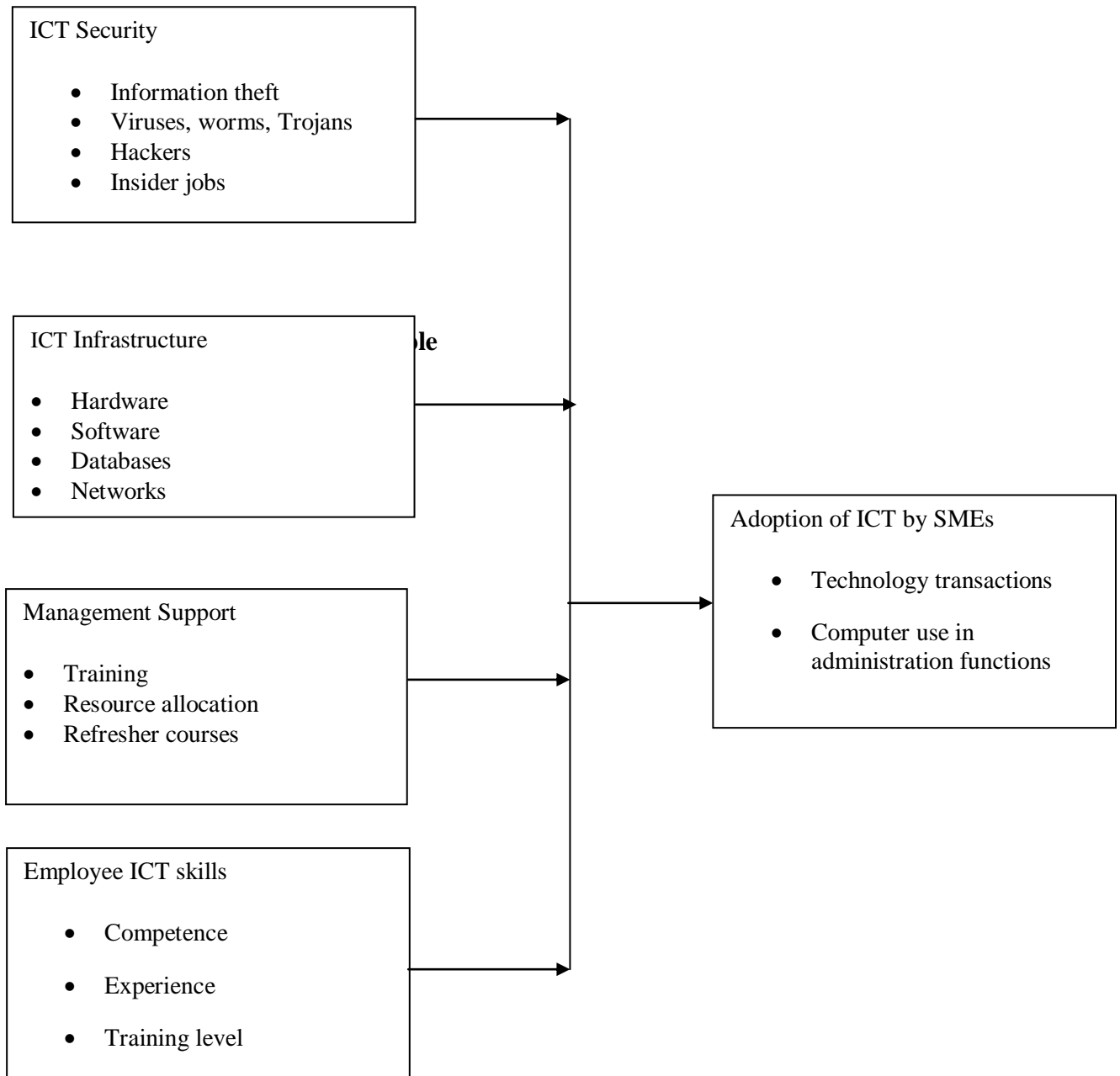


Figure 2.1: Conceptual Framework

Source: Author (2016)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

This chapter focused on describing the methodology that was employed in this study. Therefore, this chapter presented the research design as well as the population of the study, sample size, sampling technique and procedure. Furthermore, it described the data collection instruments, data analysis procedure, research validity and reliability, and ethical issues.

3.2. Research Design

According to Kothari (2008), research design is the plan enabling the researcher to arrive at solutions to problems and also guides the researcher through the several phases of the study. This research adopted descriptive research design. According to Robson (2002), descriptive design looks to explore and explain as well as add more information on a topic by portraying a precise profile of situations, events, and persons. Therefore, the descriptive design was suitable for this research because it helped to respond to the questions of the present condition/status and described the nature of the current conditions of the phenomenon under study. More so, the descriptive design helped in describing the characteristics, attitude and behaviour of the subject under study. Besides, the descriptive design explored and explained as well as added more information on a topic.

3.3. Target Population

Mugenda and Mugenda (2003) defined a population as the whole cohort of objects or individuals with common or similar characteristics. This research targeted the 1700 SMEs in

Tharaka Nithi County as documented by the county government (2015). The respondents were the managers or the owners of the SMEs.

3.4. Sampling and Sample Size

According to Kothari (2008), a sample refers to the proportion of the entire population, which is used to characterise the population in the study. He further notes that sampling is the procedure or technique used to choose the sample that will participate in the study. This in essence means that it is a process by which the respondents a research are selected.

In Kumar' (2007) study, it was emphasised that selecting the sample is important together with a stringent criteria for ensuring that the correct participants are chosen for a study. An appropriate sampling technique allows for the accuracy of the gathered information and data along with helping to save costs and time. This not only helped in getting the correct participants for this study, but also improved the biasedness in choosing those participants.

The SMEs in Tharaka Nithi County fall under various sectors such as Hotel, computer and technology, real estate, entertainment, fashion, building and construction, travel and tourism and consultancy, thus making them heterogeneous. The stratified random sampling was utilized to take care of the heterogeneity of the population. The categorization of strata was guided by the category of business that each SME falls. After the strata were in place, the research then utilised Mugenda and Mugenda (2003) formula whereby a 10% of the population in each stratum was used. Simple random sampling was utilised to select participants from each strata. The questionnaires were given to manager/owner of these SMEs. This made a total of 170 respondents as described in table 3.1.

Table 3.1: Sample Size

SME Industry	Population	Sample Size(10% of Stratum)	% of Total Sample Size
Hotel and food industry	530	53	31%
Computer and Technology	272	27	16%
Real Estate	250	25	15%
Entertainment	150	15	9%
Fashion industry	89	9	5%
Building &Construction	150	15	9%
Consultancy	120	12	7%
Travel and tourism	139	14	8%
Total	1700	170	100%

Source: Tharaka Nithi County Government (2016)

3.5. Data Collection Instruments

This study utilized a questionnaire with relevant, unambiguous, and clear questions to collect primary data. The research used semi-structured questionnaires where the respondents selected answers that reflected their views in closed questions, as well as, give their opinions in the open-ended questions. The rationale for using semi-structured questionnaire was that the researcher was able to gather standardised responses for meaningful comparison as well as get respondent's opinions on the variables of the study. Second, closed questions provided data that could easily be coded, computerised, and analysed as it collected quantitative data. On the other hand, the open-ended questions allowed the researcher to gather qualitative data.

The questionnaire was separated into six sections with each part containing guidelines on the process to be used by the respondents to fill them.

The initial section (A) contained questions for acquiring the respondents' basic information, particularly demographic data. This included educational level, gender, and frequency of computer use, age, and computer proficiency. The other sections (B-F) contained questions for exploring the barriers of ICT adoption, and the current status of ICT adoption by the SME. The survey had questions on the perceived barriers of ICT adoption in relation to technology, organizational, and external factors affecting ICT adoption by SMEs in Tharaka Nithi County.

The scales used in this research were adapted from previous literature. The scale was utilized for measuring the study's items with the exception of demographic or firm characteristics. The utilization of this scale was associated with its suitability in responding to the research questions. Specifically, the Likert scale was the most appropriate interval scale in this study. The Likert scale had 5 points such that strongly disagree=1, disagree=2, 3=neutral, agree=4, and strongly agree=5. This scale allowed the respondents to answer the items in the survey with greater specificity.

Both open and closed questions were utilized in the design of the questionnaire for the collection of relevant data to attain the purpose of this study. The questionnaire's design was semi-structured because the respondents were anticipated to answer closed questions with determined answers study's topic, as well as, give their opinions on the open questions. With regard to the categories of information examined in this study, the questionnaire aimed to gather the management demographic attributes, as well as, factors hindering ICT adoption, opinions or attitudes concerning the barriers of ICT adoption, knowledge about ICT applications in the SMEs in Tharaka Nithi, and behaviours associated with using ICT at

work. The questionnaire had questions that measured both the independent and dependent variables in this research. These questions were developed from previous studies. To ensure the data collected addressed the research issue, the concept of validity and reliability of the study have been explored.

3.5.1. Validity of Instrument

The term validity refers the degree to which the instrument of data collection measures the constructs under study. So as to ensure the instrument is valid, its contents should relevant to the need and gap identified in the study (Saunders, Lewis, & Thornhill, 2007). The questionnaire's content validity was ensured through discussing with the supervisor. All important aspects of the phenomenon were covered and tested. To add to validity, the questionnaire was adopted from a similar study by Hashim (2007).

3.5.2. Reliability of Instrument

This is the extent to which the findings of a research study are constant if a repeat study is performed (Cohen et al, 2011). The internal consistency of this study instrument was measured through Cronbach's alpha (α) coefficient of greater than 0.7, which implies greater reliability (Yates, 2010). The coefficient ranges between 0 and 1 (Cronbach, 1951).

If the Cronbach's alpha coefficient is closer to 1.0 the reliability of the items in the scale is greater. Therefore, the internal consistency will underline the degree to which all the items in this case variables measure similar construct or concept (Tavakol & Dennick, 2011).

3.6. Data Collection Procedure

Data collection has been defined as the methodology as well as the instruments that a researcher uses to collect data (Kothari, 2008). The researcher sought to gather data from the

ICT managers in the targeted SMEs. A preliminary letter for this procedure of data gathered was acquired from the University first and additional appointments were made with the relevant respondents.

The researcher administered the survey questionnaire to the respondents himself. However, in cases, where the study's respondents were unable to complete the questionnaires instantly or were busy, the researcher dropped and picked the filled questionnaires later. A deadline was set for the filling of these questionnaires so that time wastage can be avoided.

3.7. Data Analysis and Presentation

The qualitative data which was produced from open-ended questions was categorised into themes in line with study objectives and described in narrative form. The quantitative data was analysed using inferential and descriptive statistics. The researcher performed the analysis of the data assisted by the statistical Package for Social Sciences (SPSS) version 21 by conducting various statistical tests. The findings of the analysis were presented utilizing graphs, pie charts, and tables. The descriptive statistics included measures of relative frequencies, standard deviation (measure of variability), the mean (measure of central tendency) and frequency distribution tables

The inferential statistics comprised of a linear regression model. This model was utilised to determine the effect of the independent variables on the dependent variable. The form that will be taken by the multiple linear regression equation is as below.

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$$

From the equation, $Y = \text{Adoption of ICT by SMEs}$, $X_1 = \text{ICT information security}$, $X_2 = \text{ICT infrastructure}$, $X_3 = \text{Management support}$, $X_4 = \text{employee ICT skills}$, while β_1 , β_2 , β_3 and β_4 are the regression coefficient and ε is the error term.

3.8. Ethical Considerations

Ethical considerations are an important part of any research study that directly involves human participants. Research ethics in most cases deals with consent, confidentiality and anonymity (Yin, 2011). Consent involves the participants' voluntary decision to be part of the research study. Before the participants provide their consent, they will be fully briefed of all relevant information about the study and its undertakings. The information that was relayed to the participants includes the uses of the information collected, requirements of the study participants, risks, as well as research objectives. Informed consent is composed of understanding of all relevant information, provision of accurate information and voluntariness. Thus, the participants were selected from groups of persons with the ability of comprehending all the information linked to this investigation. This was necessary for the process of making voluntary decisions to take part in the research study. In particular, the investigation used informed consent documents in ensuring that involvement in this research is voluntary. The forms were emailed to the participants prior to the data collection date.

Confidentiality involves all processes that enhance non-disclosure of all the information provided by the participants to the researcher. This was achieved through direct communication with the participants on levels of confidentiality of the questionnaires as the participants are not directly identified in the report. Thus, the data reported in this paper was collective and not individualised. Ensuring the files are kept in safe places and destroyed once the report was fully compiled to prevent unauthorised access to raw data.

Anonymity is the process that ensures the identity of the participants is protected. This was

very important for the quantitative part of the study. To achieve anonymity, the participants were coded and pseudonyms used in the process of developing the research report.

CHAPTER FOUR

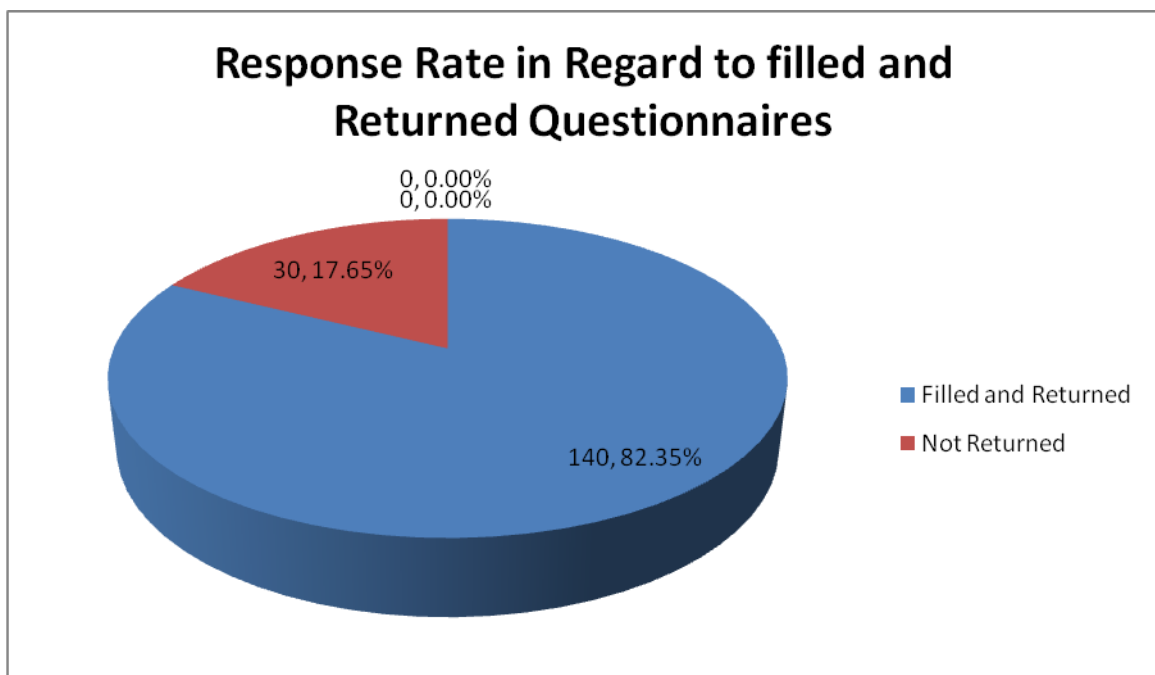
RESEARCH FINDINGS AND DISCUSSIONS

4.1. Introduction

This chapter presents the data analysed in responding to the study objectives for the topic under investigation. The section involves several sections that include demographic and the specific research objectives. The response indicates that the respondents were positive in providing their opinions.

4.2. Response Rate

Figure 4.1: Response Rate



The sample size for this study was 170 participants. Out of the one hundred and seventy, only one hundred and forty returned filled questionnaires. This amounted to a response rate of 82.35%. This response rate was adequate for this study as evidenced by Fincham (2014), who says that a response rate of above 60 % is adequate for any study.

4.3. Background Information

The researcher collected this information to determine the demographic details of the respondents. This information includes the respondents' age, working experience, educational level, and age brackets.

4.3.1. The Age of the Respondents

The research collected data to determine the age of the respondents from whom the information on the subject of study was sought. The findings are presented in table 4.1.

Table 4.1: Age of the Respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
less than 20 years	22	15.3	15.8	15.8
21 to 30 years old	40	27.8	28.8	44.6
31 to 40 years	54	37.5	38.8	83.5
Valid 41 to 50 years	11	7.6	7.9	91.4
more than 50 years	12	8.3	8.6	100.0
Total	140	100	100.0	
Missing System				

Total	140	100.0		
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Source: Survey Data, (2016)

A majority of the respondents were aged between 31 and 40 old with a proportion of 37.5 percent. The second largest group was between the ages of 21 to 30 years of age with a proportion of 20.7 percent while those with less than 20 years were 15.3 percent. Those with more than 50 years of age were 8.3 percent while those between 41 to 50 years were 7.6 percent of the respondents. The age is not particularly significant considering that most organisations in the modern management do not have age preference in their employment policies.

4.3.2. The Gender of the Respondents

The research sought to establish the respondents' gender composition who provided information on the subject of study. The findings are presented in table 4.2.

Table 4.2: Gender of Respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Male	76	52.8	54.3	54.3
Valid Female	64	44.4	45.7	100.0
Total	140	97.2	100.0	
Missing System	4	2.8		
Total	144	100.0		

Source: Survey Data, (2016)

The results shown in table 4.2 show that 52.8 percent of the respondents are male and 44.4 percent respondents were female. The findings presented signify that there is gender imbalance and inequality in the company though in the customer response brought no inequality and gender imbalance. However, gender is not particularly significant considering that most organisations in the modern management do not have gender preference in their employment policies, with both men and women playing the same roles.

4.3.3: The Education Level of Respondents

The study in this section sought to provide the researcher with insight of the respondents' educational level. The findings are presented in table 4.3.

Table 4.3: Education Level of Respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
Less than high school	19	13.2	13.6	13.6
High school graduate	29	20.1	20.7	34.3
Bachelor's degree	45	31.3	32.1	66.4
Master's degree	31	21.5	22.1	88.6
Doctoral degree	16	11.1	11.4	100.0
Total	140	97.2	100.0	
Missing System	4	2.8		
Total	144	100.0		

Source: Survey Data, (2016)

From the results, the highest proportion of the respondents has a bachelor's degree at 31.3 percent whereas the high school graduates were 20.1 percent of the respondents. 13.2 percent of the respondents on the hand have less than high school qualifications with the least proportion of the respondents having doctoral degree. The findings show that most of the respondents have good education which can enable them relate well to the concept of ICT adoption.

In assessing the implementation of information and communication technology in SMEs, the level of education is a critical variable that has to be put into consideration. There is also a close association between the level of education and the perception on the need to have ICT infrastructure in place. This was the reason why the study sought to determine this information.

4.3.4. Number of years respondents had worked in the organisation

The research sought to determine the period in which the respondent has been working in the organisation. The reason for seeking the information is because the longer one works in an organisation, the more they get informed about the ICT adoption.

Table 4.4: Number of years respondents had worked in the organisation

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Less than 5 years	30	20.8	21.4	21.4
5-10 years	36	25.0	25.7	47.1
11-15 years	60	41.7	42.9	90.0

16-20 years	11	7.6	7.9	97.9
Above 20 years	3	2.1	2.1	100.0
Total	140	97.2	100.0	
Missing System	4	2.8		
Total	144	100.0		

Source: Survey Data, (2016)

The results show that the highest percentage of respondents has worked in the organisation for between eleven to fifteen years. 25% of the respondents have worked in the organisation for 5 to 10 years, while 20.8 percent. Those that have worked for 16 to 20 represent 7.6% of the respondents while those that have worked for over 20 years are 2.1 percent of the respondents. Therefore, these results indicate that all the respondents had extensive understanding of the organisation and were in a good position to respond to the research questions.

4.3.5: Business Category

The study wanted to determine the kind of businesses that the respondents undertake. It is significant to appreciate that different business categories have different points of view in relation to ICT adoption in SMEs.

Table 4.5: Business category

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Hotel and Food Industry	14	9.7	10.0	10.0
Computer and Technology	41	28.5	29.3	39.3

	Real Estate	54	37.5	38.6	77.9
	Entertainment	8	5.6	5.7	83.6
	Fashion Industry	23	16.0	16.4	100.0
	Total	140	97.2	100.0	
Missing	System	4	2.8		
Total		144	100.0		

Source: Survey Data, (2016)

Results indicate that most of the respondents are in the real estate at 37.5 percent while computer and technology have a proportion of 28.5 percent. The fashion industry, on the other hand, had a respondent of 16 percent while hotel and industry business was represented by 9.7 percent of the respondents. Lastly, only 5.7 percent of the respondents were involved in the hospitality industry.

4.3.6. Validity of the Instrument

The validity of content of the questionnaire used to collect data for this study was ensured by discussing it with the supervisor. All the important aspects of the phenomenon under study were covered and tested. More so, the instrument was adopted from a previous similar study by Hashim (2007).

4.3.7. Reliability Test

The researcher established the reliability of the scale used by internal consistency test using Cronbach's alpha (α) coefficient (Yates, 2010).

Table 4.6: Reliability Test

Reliability Statistics		
Variable	Cronbach's Alpha	N of Items
ICT Security	0.749	5
Employee ICT skills	0.779	5
Adoption of ICT	0.728	5
Overall	0.752	5

Source: Survey Data, (2016)

According to Yates (2010), if the Cronbach's alpha coefficient is closer to 1.0, then the reliability of items is greater. The alpha value threshold is at above 0.7. From the results, employee ICT skills showed the greatest reliability ($\alpha= 0.779$). This was followed by ICT security: ($\alpha=0. 749$) and adoption of ICT ($\alpha=0.728$). The overall alpha (α) coefficient value is 0.752. This means that the study variables were reliable since they were within 0.7 threshold.

4.4. Descriptive statistics

4.4.1. ICT Security and ICT Adoption

The respondents rated a number of issues concerning the security of the ICT. The responses were recorded in the table 4.7. The respondents were asked whether they were aware of the security threat to the ICT. The mean was 3.8357 while the standard deviation was 0.64161. The results show that majority of the respondents agree that they are aware of the security threats to the ICT. Asked if all the computers are installed with softwares, most of the respondents agreed with a mean of 3.9571 with a standard deviation of 0.44675. This indicates that majority of the respondents agree that all computers in their organisations are installed with antivirus programs. Asked whether their computers have suffered threats

before, the mean is 4.0214 while the standard deviation is 0.61712, meaning majority of the respondents strongly agrees that computers in their firms have suffered security attacks. The standard deviation confirms this even more as the responses are spread near the mean. On whether the staff understands the importance of data security, the mean was 4.2714 while the standard deviation was 0.98801, showing that most of the respondents strongly agree with the assertion. The results indicate that staff members are aware and understand the importance of data security.

Table 4.7: ICT Security

Statements	N	Mini mum	Maxim um	Sum	Mean	Std. Deviati on	Varia nce
I am aware of ICT security threats	140	1.00	5.00	537.0 0	3.835 7	.64161	.412
All the computers are installed with antivirus soft wares	140	1.00	5.00	554.0 0	3.957 1	.44675	.200
Our computers have suffered one or all of the security threats: virus, hacking or insider jobs compromises	140	1.00	5.00	563.0 0	4.021 4	.61712	.381
Our staff understand the importance of information security	140	1.00	5.00	598.0 0	4.271 4	.98801	.976
We are afraid of digitalizing our functions due to fear of information security	140	1.00	5.00	571.0 0	4.078 6	.86555	.749

Valid N (list wise)	140						
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Source: Survey Data, (2016)

The respondents were asked whether they were afraid of ICT adoption due to security threats. Most of the respondents strongly agreed that they feared security threats with a mean of 4.0786 while the standard deviation is 0.8655.

These findings agree with those of Featherman et al. (2010) who argued that information security is one of the reasons why most organisations are reluctant to embrace digitalisation. These according to the authors could see the downfall of the organisation. More so, other problems could be purely malfunctioning of the systems, which could cause real havoc in the enterprise running of daily activities. Some of these can be hardware failure, system crashing, and software bugs like bugs.

Table 4.8: ICT security as a serious threat

Question	N	Minimum	Maximum	Mean	Std. Deviation
Do you think ICT security is a serious Threat to the adoption of ICT by SMEs?	140	1.00	2.00	1.0857	.28095
Valid N (list wise)	140				

Source: Survey Data, (2016)

Asked whether they thought that ICT security is a threat to the adoption of ICT, most of the respondents agreed that it was a threat, asked why they thought so; most of the respondents say that they were afraid of getting their organisational information compromised. Sarkar

(2010) asserts that a deliberate action by people whether insiders or outsiders poses a serious security threat to the information of an enterprise. He notes that although some of these actions may be accidental, the damage can be detrimental.

4.4.2. ICT Infrastructure and ICT Adoption

The study wanted to determine the opinion of the respondents on the infrastructure needed for ICT adoption in SMEs. The respondents had to select their responses as either strongly disagree, disagree, neutral, agree, or strongly agree.

Table 4.9: ICT Infrastructure

Statements	N	Minimum	Maximum	Mean	Std. Deviation
My organisation has adequate computer systems	140	1.00	6.00	3.8643	1.04027
The network and internet infrastructure is good in my organisation	140	1.00	5.00	3.7929	1.42686
Existing infrastructure supports ICT integration to business processes	140	1.00	5.00	3.1857	1.30072
The Software and other computer applications are readily available	140	1.00	5.00	3.8714	1.30766
Valid N (list wise)	140				

Source: Survey Data, (2016)

The respondents were asked whether their organisations have adequate computer systems, most agreed with a mean of 3.8643 with a standard deviation of 1.04027. This indicates that majority of the respondents agreed that their organisations have adequate computer systems. However, with the standard deviation being 1.04027, it shows that the responses were spread out away from the mean, an indication that some respondents may not have agreed with this assertion. Asked on whether the internet infrastructure was good, the mean was 3.7929 with a standard deviation of 1.426 to signify that most of the respondents were in agreement. The results, especially the standard deviation shows that the responses were spread out away from the mean. Therefore, this shows that there are many respondents who did not agree with this assertion and therefore, many of SMEs could be lacking internet infrastructure. Asked on the existing infrastructure and whether they support ICT integration to the business processes, most of the respondents agreed at a mean of 3.1857 and the standard deviation was 1.30072, an indication that the responses were spread away from the mean and therefore, many respondents could have disagreed with the assertion. Asked on whether the software and other computer applications are readily available the mean was 3.8714 and the standard deviation was 1.30766. This shows that although majority agreed there was software and applications are available, the responses were spread out away from the mean and this means that many respondents could have disagreed with the assertions. The findings agree with the work of Duncan (2010) who has indicated that many enterprises even in developed countries have had problems adopting ICT because of the cost of hardware, software infrastructure. The respondents were asked what they thought about ICT adoption in Tharaka Nithi County; most said that the adoption rate is still low amongst most business organisations.

4.4.3. Management Support and ICT Adoption

The study focused on obtaining the responses on management support as far as ICT adoption is concerned. The findings are illustrated in table 4.10. Most of the respondents agree that their organisations have enough ICT resources for learning, training, and capacity building with a mean of 2.6643 with a standard deviation of 1.1276. This means that majority of the respondents were neutral or not sure whether their organisations have enough ICT resources for training and learning. However, the standard deviation shows the responses were spread away from the mean, an indication that many respondents could have agreed or disagreed with the assertion.

Table 4.10: Management Support

Statements	N	Minimum	Maximum	Mean	Std. Deviation
My organisation has enough ICT resources for learning, training and capacity building	140	1.00	5.00	2.6643	1.12276
My organisation has budgeted for upgrading ICT resources	140	1.00	5.00	3.3786	1.49082
My organisation holds workshops and training seminars on ICT for our staff	140	1.00	5.00	3.0714	1.47713

There is a formal plan of monitoring and evaluating ICT resources by the management	140	1.00	5.00	3.5071	1.14110
The management attitude is positive about ICT integration in your organisation	140	1.00	5.00	2.8714	1.54008
Valid N (list wise)	140				

Source: Survey Data, (2016)

On the budget for upgrading the ICT resources, the mean was 3.3786 and a standard deviation of 1.47713. This indicates that majority agree with the assertion; however, the responses are spread away from the mean as shown by standard deviation. This could mean that some respondents disagreed with this assertion.

The respondents also agreed that the organisation holds seminars with a mean of 3.014 with a standard deviation of 1.4110, which indicates that responses were spread way from the mean. This means that some respondents disagreed with this assertion and thus there are no seminars and trainings held for staff.

Further, the respondents agreed that there is a framework for adopting the ICT with a mean of 3.5071 with a standard deviation of 1.14110. The results show that although majority agreed, the responses were spread away from the mean and therefore, show that some respondents disagreed with the assertion.

The management attitude was thought not to be positive with a mean of 2.8714 and a standard deviation of 1.54008 signifying that most of the respondents do not agree with the assertion. The findings agree with the research done by Zaied (2011) that indicated that management of SMEs shy away from investing in various ICT technologies as well as

training their staff on matters of ICT. He argues that most of the managers fear the takeover of their positions by subordinate staff.

4.4.4. Employee ICT Skills and ICT Adoption

The study wanted to determine whether the employees of the SMEs had ICT skills because they are necessary for ICT adoption in SMEs. The respondents had to select their responses as either strongly disagree, disagree, neutral, agree, or strongly agree. The results are shown in table 4.11.

Asked whether the staff have received enough training on the use of ICT the mean was 2.8714, and standard deviation of 1.54008, which indicates majority disagreed. However, the standard deviation shows that the responses were spread out away from the mean, which means some respondents agreed or were neutral. On whether the staffs have the right skills to use ICT, the mean is 2.6357 and a standard deviation of 1.11375, which shows majority, disagreed with this assertion. Further, the respondents were asked whether their staff were competent enough to use ICT and the responses had a mean of 3.0286 and standard deviation of 1.38825. This means that majority of the respondents were neutral and that responses are spread away from the mean. Thus, some respondents had agreed or disagreed with the assertion.

Table 4.11: Employee ICT Skills

Statements	N	Minimum	Maximum	Mean	Std. Deviation
Our staff have received enough training on the use of ICT	140	1.00	5.00	2.8714	1.54008

Our staff have the right skills to use ICT technologies in firm	140	1.00	5.00	2.6357	1.11375
Our staff are competent enough to use ICT in the organisation	140	1.00	5.00	3.0286	1.38825
Our staff receive regular refresher courses on ICT skills	140	1.00	5.00	3.2143	1.23955
Our staff understand various ICT technologies and apply them in our organisation	140	1.00	5.00	3.0357	1.20795
Valid N (list wise)	140				

Source: Survey Data, (2016)

Asked whether the staff receive regular refresher courses on ICT skills, an average mean of 3.2143 was obtained, which shows neutrality in their responses with a standard deviation of 1.23955. This standard deviation indicates that some respondents either agreed or disagreed and that is why the responses were spread away from the mean. On whether the staff understands various ICT technologies and applies them in the organisation; the mean was 3.0357 with a standard deviation of 1.20795, which suggests that most of respondents were neutral in their responses. The standard deviation implies that the responses were spread out

away from the mean and therefore, some respondents either agreed or disagreed with the assertion.

These findings were in agreement with a study done by Khalil et al (2013) who argues that employee ICT skills influence the adoption of ICT by SMEs. The authors argue that adoption of ICT require changes in the level of performance of employees and adequate skills in ICT skills. They further suggest that poor ICT skills by employees hinder the successful adoption of ICT by SMEs.

4.3.5. Adoption of ICT

This study wanted to determine the opinion of the respondents on the adoption level of ICT in small and medium size enterprises. The respondents had to select their responses as either strongly disagree, disagree, neutral, agree, or strongly agree.

Table 4.12: Adoption of ICT

Statements	N	Minimum	Maximum	Mean	Std. Deviation

I think we have adopted ICT in our organisation	140	1.00	5.00	3.2571	1.23131
We have good internet access in our organisation	140	1.00	5.00	3.1643	1.43748
We have enough computers in our firm	140	1.00	5.00	3.0214	1.34361
I think there is a problem in the uptake of ICT by SMEs in general	140	1.00	5.00	4.2643	.09025
Valid N (list wise)	140				

Source: Survey Data, (2016)

The respondents were asked whether they had adopted ICT in the organisation. The responses had a mean of 3.2571 with a standard deviation of 1.23131. This indicates a neutral response, which means they could not tell whether they had adopted ICT or not. On the internet access, the mean is 3.1643 and standard deviation of 1.43748. These results show that the respondents remained neutral on the internet issue, although the standard deviation indicates that responses were spread out away from the mean, indicating that some respondents agreed and others disagreed. On whether there are enough computers in the organisation, the mean was 3.0214 and a standard deviation of 1.34361, which shows neutrality in their responses. However, the standard deviation indicates a deviation from the mean, which means some respondents agreed and others disagreed with the assertion. Most of the respondents, however, think that there is a problem in the adoption of ICT with a mean of 4.2643 and standard deviation of 0.09025. This signifies that most of the respondents agree that there is a level of ICT adoption in their organisations although the level of adoption still remains low. As such, the responses indicated that although there was a bit of adoption of ICT by SMEs, the adoption level was still low and not to the expected levels.

These findings are in agreement with a research done by Ardjouman (2014) that indicated that most SMEs in developing countries have not adopted ICT. Further, the findings agree with a study done by Nduati *et al* (2015), which showed the adoption rate of ICT in Kenyan SMEs remained low at only 15%. Further, the findings agree with a report done by the Department of ICT of Tharaka Nithi County Government which showed that less than 14% of SMEs in the county have adopted ICT.

4.5. Regression analysis

The regression analysis method was used to come up with an explanation of the factors that influence ICT adoption by *SMEs*; the analysis was done with the use of SPSS analysis tool. The model equation is as shown below.

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$$

Where

Y = Adoption of ICT by SMEs

X₁ = ICT Security

X₂ = Infrastructure on ICT

X₃ = Management Support

X₄ = Employee ICT Skills

ε = Error term

Table 4.13: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.918 ^a	.843	.801	6.19999

Source: Survey data (2016)

a. Predictors: (Constant), Employee

ICT Skills,

Management Support, ICT Infrastructure, ICT Security

The value of the adjusted R squared in the final model (.801) shows that the 80.1 percent of variation of the adoption of ICT can be explained by the combination of the four variables; ICT Security, ICT infrastructure, management support and Employee ICT skills. The remaining 19.9 percent account for the unexplained variance, which means 19.9 percent of variability has not been accounted for.

Table 4.14: ANOVA Table

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3087.401	4	771.850	20.079	.000 ^b
	Residual	576.599	15	38.440		
	Total	3664.000	19			

Source: Survey Data, (2016)

a. Dependent Variable: Adoption of ICT

b. Predictors: (Constant), Employee ICT Skills, Management Support, ICT Infrastructure, ICT Security

The ANOVA analysis for individual factors affecting adoption of ICT by SMEs is presented in Table 4.14. The p-value of 0.000, which is less than 0.05 indicates that the overall model is significant. This means that at least one of the independent variables was a significant predictor of the dependent variable.

Table 4.15: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	49.322	9.908		4.978	.000
ICT Security	.939	.163	.670	5.773	.000
ICT Infrastructure	-.114	.064	-.198	-1.794	.000
Management Support	1.021	.255	.435	-3.997	.001
Employee ICT Skills	.043	.135	.037	.319	.000

Source: Survey data (2016)

a. Dependent Variable: Adoption of ICT

The coefficients for the four individual factors affecting adoption of ICT by SMEs are presented in Table 4.15. ICT Security ($p=0.000$), ICT Infrastructure ($p=0.000$), Management Support ($p=0.001$) and Employee ICT Skills ($p=0.000$) showed that all the four predictor variables were significant factors that affected the adoption of ICT by SMEs.

From the results, a unit increase in ICT security would result in a.939increase in ICT adoption by small and medium-sized enterprises. ICT security is a significant determinant of

ICT adoption as shown by the p-value of 0.000 that is <0.01 . Therefore, ICT security affects ICT adoption by SMEs. These findings agree with a study by Featherman et al (2010) who argued that information security is one of the reasons why most organisations are reluctant to embrace digitalisation. These according to the authors could see the downfall of the organisation. More so, other problems could be purely malfunctioning of the systems.

The results also show that a unit increase in ICT infrastructure would result in a 0.114 unit decrease in the adoption rate of ICT by SMEs in Tharaka Nithi County. ICT infrastructure is a significant determinant of ICT adoption as indicated by the p-value of 0.000. Therefore, this shows there is a negative significant relationship between ICT infrastructure and adoption of ICT by SMEs. This disagrees with a study by Duncan (2010), who suggested that many enterprises even in developed countries have had problems adopting ICT due to the cost of hardware and software infrastructure.

More so, the results show that a unit increase in the Management support would result in a 1.02 increase in ICT adoption by SMEs in Tharaka Nithi County. In this regard, management support is a significant predictor of adoption of ICT as shown by the p-value of 0.001 which is <0.01 . The p-value being less than 0.01 shows there exist a positive significant association, and thus management support affects adoption of ICT by SMEs. This agrees with Harrigan et al (2010) who posits that the management's level of ICT knowledge coupled with positive attitude towards ICT increases the level of ICT adoption. Harrigan also indicates that lack of support from management leads to low rate of ICT adoption by SMEs.

On the employee ICT skills, a unit increase in the value of ICT skills would result in a .043 increase in the level of adoption of ICT by an SME, and vice versa. According to the results, ICT employee skills is a significant predictor of adoption of ICT. This is supported by a study done by Ongori and Migiro (2011) who argued that when employees are proficient in ICT

matters, the adoption rate increases. Also, a study done by Apulu and Ige, (2011) showed that the knowledge of the employees of an enterprise regarding ICT is positively related to the SME's ICT adoption. On a similar note, Ongori and Migiro (2011) also cited employees' lack of proficient ICT skills as being one of the major hindrances in the acceptance of ICT in SMEs globally.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Introduction.

This chapter provides the summary, conclusions, and recommendations. The research focussed on SMEs in Tharaka Nithi County with the effort of looking at the factors affecting adoption of ICT. Data was collected and analysed with the assistance of SPSS.

5.2: Summary

Despite the importance placed ICT adoption and utilization by SMEs, studies that were reviewed indicated that a majority of SMEs in developing countries have not adopted ICT in their activities. Although many countries in Africa have an adoption rate of ICT at 48 percent among SMEs, the Kenyan rate of ICT adoption and utilization remains low with only an average of 15 percent. This study focused on investigating the factors that affect ICT adoption by SMEs, with a particular focus on Tharaka Nithi County. A descriptive research design was adopted due to its appropriateness in portraying a precise profile of situations, events, and persons. The study targeted the 1700 SMEs in Tharaka Nithi County as documented by the county government, where the respondents were the managers. Stratified random sampling was used so as to take care of data heterogeneity. Ten percent from each stratum was used making a total of 170 respondents. Semi-structured questionnaires were utilized to gather primary data where drop and collect later method was used.

The research has shown how adoption of ICT is affected by various factors. The study has investigated how ICT security, ICT infrastructure, Management support and employee ICT skills affect ICT adoption by SMEs with a focus on Tharaka Nithi County.

5.2.1. ICT Security

ICT security is among the factors that affect ICT adoption by SMEs as it was shown that an increase in ICT security resulted in increased adoption of ICT. Additionally, it has been revealed that most corporate management are fearful of these security threats. The issue of viruses, worms, eavesdropping and information theft coupled with deliberate attacks is what many SMEs fear most.

5.2.2. ICT Infrastructure

The ICT infrastructure is another important factor that influences the adoption of ICT by SMEs. The results revealed a negative and significant association between this factor and ICT adoption, where increased ICT infrastructure would result to a decreased adoption of ICT by SMEs, which disagrees with many studies. Investments in ICT for enterprises may be viewed as a further cost, and supporting considerable ICT adoption is a challenge experienced by numerous organisations and systems in developing countries.

5.2.3. Management Support

The findings on management support also were seen to be affecting adoption of ICT by SMEs, which according to results showed a positive and significant relationship. As such, a unit increase in management support would lead to increased adoption of ICT by SME and vice versa. The study revealed that the management's level of ICT knowledge coupled with positive attitude towards ICT increases the level of ICT adoption. Consequently, this is not the case as the owners of SMEs who most of the times double as the senior managers have little knowledge of ICT, which is a serious barrier to its adoption. It was also revealed that the management of SMEs shy away from investing in various ICT technologies as well as training their staff on matters of ICT due to costs associated with it and ignorance of the associated benefits.

5.2.4. Employee ICT Skills

Lastly, employee ICT skills was also seen to affect ICT adoption by SMEs. The results showed that this factor is positively and significantly related to the adoption of ICT. It is therefore, apparent that a unit increase in employee ICT skills would increase the adoption of ICT by SMEs. Therefore, if employees view ICT as either fulfilling their own requirements or those of their customers, the likelihood of accepting ICT in the organization increases.

5.3. Conclusion

One of the objectives was to determine the influence of ICT security on the adoption of ICT by SMEs. This objective was achieved as a positive significant association existed between ICT security and ICT adoption. Specifically, the analysis established that a unit increase in the ICT security predicted increased in the adoption of ICT by SMEs.

The other objective was to assess how ICT infrastructure affected the ICT adoption by SMEs in Tharaka-Nithi County. The study concludes that ICT infrastructure was a significant predictor of ICT adoption by SMEs. However, the results of this predictor disagreed with previous studies. This means that ICT infrastructure is negatively and significantly related to ICT adoption.

On management support, the study showed that management support was a significant predictor of the adoption of ICT by SMEs. The results indicated that a unit increase in management support predicted an increased ICT adoption by SMEs. These results were in agreement with most of the studies regarding this variable.

On the employee ICT skills, the study revealed that it was a significant predictor of ICT adoption by SMEs in Tharaka-Nithi County. The results showed that an increase in employee ICT skills would lead to an increased adoption of ICT.

This study established the significant effects of ICT security, ICT infrastructure, management support and employee ICT skills on ICT adoption by SMEs. Both empirical and statistical evidence have proven these variables are significant predictors of ICT adoption by SMEs. Therefore, the study has demonstrated that for effective ICT adoption by SMEs, ICT security must be enhanced, improved ICT infrastructure, support from management, and employees should possess ICT skills.

5.4. Recommendations

The study recommends that the county governments to support the adoption of ICT by SMEs through enhancing and providing ICT infrastructure like internet access as a strategy of enticing SMEs to implement ICT.

The central government needs to implement policies and laws that are geared towards enhancing ICT security so as to eradicate the fear for information security, as the study has shown that improved ICT security would lead to increased adoption of ICT.

There is also need for employees of these SMEs to be trained on ICT usage and enrolled for refresher courses regularly to enhance their ICT skills, as the findings of the study have shown that increased employee ICT skills would lead to increased adoption of ICT by SMEs.

5.5. Suggestion for Further Research

Further research should be done geared towards establishing the relationship between ICT adoption and performance of SMEs. This was not covered in this study and therefore, it would be important to investigate whether adoption of ICT has any impact on performance of SMEs.

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APPENDICES

Appendix I: Introduction Letter

Dear Respondent;

I am a currently a student at Kenyatta University in the department of Business Administration. I am carrying out a research project that requires me to collect data on “**An Assessment of Adoption of Information and Communication Technology Among Small and Medium-Sized Enterprises in Tharaka Nithi County, Kenya.**”

I'm kindly requesting for your participation by accepting to answer the questions in all sections regarding your business as provided in this questionnaire. By doing this, you will be participating and facilitating the research study. Please not that there is no monetary benefits associated with your participation and that you will be doing it willingly without coercion of any kind.

The confidentiality of all the information you provide is highly guaranteed. Also, your identity will not be revealed and you will be treated as anonymous. Your responses will be used for academic purposes only

Your participation is highly appreciated.

Thank you.

Appendix II: Survey Questionnaire

Section A: Demographic Details

1. Age:

- a) Less than 20 years []
- b) 20-30 years []
- c) 31-40 years []
- d) 41-50 years []
- e) More than 50 years []

2. Gender:

- a) Male []
- b) Female []

3. Educational level:

- a) Less than high school []
- b) High school graduate []
- c) Bachelor's degree []
- d) Master's degree []
- e) Doctoral degree []

4. How many years have you worked in this organisation?

- a) Less than 5 years []
- b) 5-10 years []
- c) 11-15 years []
- d) 16-20 years []
- e) Above 20 years []

5. Please indicate your business category

- a). Hotel and Food Industry []
- b). Computer and Technology []
- c). Real Estate []
- d). Entertainment []
- e). Fashion Industry []
- f). Building & Construction []
- g). Consultancy []
- h). Travel and Tourism []

SECTION B: ICT SECURITY

Please provide your ratings about the following statements related to information security of ICT in the organisation using a scale with five scores, which are strongly disagree (1), disagree (2), Neutral (3), agree (4), and strongly agree (5)

Statement	1	2	3	4	5
I am aware of ICT security threats					
All the computers are installed with antivirus softwares					
Our computers have suffered one or all of the security threats: virus, hacking or insider jobs compromises					
Our staff understand the importance of information security					
We are afraid of digitalizing our functions due to fear of information security					

Do you think ICT security is a serious threat to the adoption of ICT by SMEs?

Yes No

If Yes, why do you think so?

SECTION C: ICT INFRASTRUCTURE

The following statements reflect your opinions regarding the status of ICT infrastructure in your organisation using a scale with five scores, namely, strongly disagree (1), disagree (2), Neutral (3), agree (4), and strongly agree (5). Please tick an appropriate response.

Statements	1	2	3	4	5
My organisation has adequate computer systems					
The network and internet infrastructure is good in my organisation					
Existing infrastructure supports ICT integration to business processes					
The Software and other computer applications are readily available					

What is your view of ICT infrastructure in the county?

SECTION D: MANAGEMENT SUPPORT

The following statements reflect your opinions regarding the status of ICT infrastructure in your organisation using a scale with five scores, namely, strongly disagree (1), disagree (2), Neutral (3), agree (4), and strongly agree (5). Please tick an appropriate response

Statements	1	2	3	4	5
My organisation has enough ICT resources for learning, training and capacity building					
My organisation has budget for upgrading ICT resources					
My organisation holds workshops and training seminars on ICT for our staff					
There is a formal plan of monitoring and evaluating ICT resources by the management					
The management attitude positive about ICT integration in your organisation					

In your opinion, is there enough support by management for SMEs to adopt ICT?

SECTION E: EMPLOYEE ICT SKILLS

How would you rate the ICT knowledge level of your staff members?

Excellent [] Good [] Average [] Poor []

Please provide your ratings about the following statements related to user skills of ICT in your organisation using a scale with five scores, which are strongly disagree (1), disagree (2), Neutral (3), agree (4), and strongly agree (5)

Statements	1	2	3	4	5
Our staff have received enough training on the use of ICT					
Our staff have the right skills to use ICT technologies in firm					
Our staff are competent enough to use ICT in the organisation					
Our staff receive regular refresher courses on ICT skills					
Our staff understand various ICT technologies and apply them in our organisation					

SECTION F: ADOPTION OF ICT

1. Do you think there is a problem in the uptake of information and communication technology by SMEs?

Please provide your ratings about the following statements related to adoption of ICT in your firm using a scale with five scores, which are strongly disagree (1), slightly disagree (2), no opinion (3), slightly agree (4), and strongly agree (5)

Statements	1	2	3	4	5
I think there is a problem in the uptake of ICT by SMEs in general					
We have enough computers in our firm					
We have good internet access in our organisation					
I think we have adopted ICT in our organisation					

2. What other technologies are available and being utilised in your firm?

3. Give recommendations on the adoption of ICT by SMEs

