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**ADOPTION OF INFORMATION COMMUNICATION TECHNOLOGIES (ICTs) IN  
KENYAN SMALL AND MEDIUM ENTERPRISES (SMEs)**

**BY**

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**21228914**

**Submitted in accordance with the requirements for the degree of**

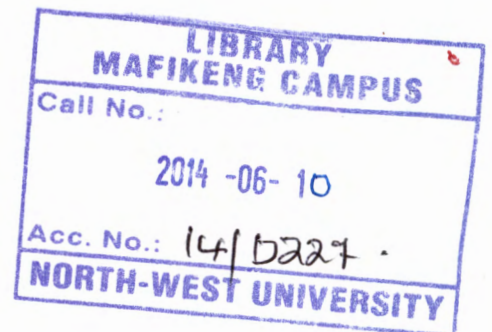
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**At the**

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**PROMOTER: PROFESSOR S. O. MIGIRO**

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**DECLARATION**

**STUDENT NUMBER 21228914**

I, Henry Ongori, declare that the PhD thesis entitled "*Adoption of Information Communication Technologies by Kenyan Small and Medium Enterprises (SMEs)*" is my original work and that all sources I have used in the thesis have been indicated and acknowledged. This thesis has not been previously submitted for the award of any other academic degree qualification at any other academic institution.

Henry Ongori (21228914)  Date 25/2/2014

## ABSTRACT

Small and Medium Enterprises (SMEs) play a significant role in both the developing and developed economies in job and wealth creation. However, SMEs face multiple challenges such as lack of infrastructure, market intelligence information, managerial skills, financial resources which are all related to non-adoption of information communication technologies (ICTs). The present study examines the adoption of information communication technologies in Kenyan SMEs. The study investigates factors that influence the process of ICTs adoption, barriers to ICTs adoption, benefits of adopting ICTs, and strategies to mitigate against the ICTs adoption challenges. The study also investigates the role of government in supporting SMEs in the adoption of ICTs. The study employs a cross sectional survey research design, and uses the questionnaire as the main research instrument. The target population of the study were SMEs owners/managers. The SMEs selected for the study are Furniture-Wood and Metal and Fabrication sub-sectors of the industry. Stratified random sampling was used to identify SMEs for inclusion in the survey. Data collected was analysed with the use of SPSS in which descriptive statistics were generated for interpretation. Findings of the study showed that pressure from competitors influenced ICT adoption in SMEs. The ICTs commonly used by SMEs was the Mobile Phone and that external barriers inhibit the adoptions of ICTs by SMEs in contrast to internal barriers. Findings showed that the major benefit of ICTs adoption was the facilitation of quick flow of information within and outside the SMEs for decision making. The study contributes to the body of knowledge by enabling policy makers to appreciate the importance of ICTs in the development and sustainability of SMEs. A conceptual framework of ICTs adoption by SMEs in developing and developed countries has also been proposed. The study recommends that Information Resources Centres should be located in urban and rural areas in order to disseminate necessary information to SMEs owners/managers on the potential benefits of ICTs adoption in business.

## **PUBLICATIONS IN REFEREED JOURNALS**

1. Ongori, H. & Migiro, S. (2011). Understanding the Drivers of Information and Communication Technologies Adoption by Kenyan Small and Medium Enterprises. *International Journal of Management Research and Review*, 1(1):1-16.
2. Ongori, H. & Migiro, S. (2011). Usage of ICTs adoption by Kenyan Small Medium Enterprises: Theoretical Arguments and Empirical Evidence. *International Journal of Information Systems Management Research and Development*, 1(1):8-24
3. Ongori, H. & Migiro, S. (2011). Factors affecting MSE Information Communication Technologies Adoption in Kenya. *Botswana Journal of Business*, 4(1):59-69.
4. Ongori, H. & Migiro, S. (2010). Information Communication Technologies adoption in SMEs. Literature Review. *Emerald, Journal of Chinese Entrepreneurship*, 2(1):93-104.

## **Conference Papers Presented**

1. Ongori, H & Migiro, S. (2011). Enhancing SMEs competitiveness: Strategies to lessen barriers to ICTs adoption by SMEs. Proceedings of the 1<sup>st</sup> International conference on Business Innovation and Growth held on 13-15<sup>th</sup> July 2011 at the Faculty of Business, University of Botswana, Gaborone, Botswana.
2. Ongori, H. & Migiro, S.O. (2010). Adoption and Assimilation of Information Communication Technologies in Kenyan SMEs. Paper presented at the 1<sup>st</sup> International Conference on Leadership and Management for Sustainable Development held on 6-8<sup>th</sup> October, 2010 at the UNISA Graduate School of Business Leadership (SBL), South Africa.

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## **DEDICATION**

I dedicate this thesis to my wife, Mokeira, and to my children, Alex, Alvin and Allan who stood by me during my absence. The thesis is also dedicated to my parents Ongori Mabiria and Paustina Kwamboka who took me to school.

## TABLE OF CONTENTS

DECLARATION .....	ii
ABSTRACT .....	iii
PUBLICATIONS IN REFEREED JOURNALS .....	iv
ACKNOWLEDGEMENT .....	v
DEDICATION .....	vi
TABLE OF CONTENTS .....	vii
LIST OF TABLES .....	xii
LIST OF FIGURES .....	xiii
LIST OF ABBREVIATIONS .....	xiv
CHAPTER 1 .....	1
BACKGROUND INFORMATION .....	1
1. Introduction .....	1
1.1 Background to the Study .....	1
1.1.1 Nature of SMEs .....	1
1.1.2 Characteristics of SMEs .....	2
1.1.3 Role of SMEs .....	2
1.1.4 Small and Medium Business Enterprises in Kenya .....	4
1.1.5 Challenges facing SMEs Development and Competitiveness .....	5
1.2 Potential Use of Information and Communication Technologies (ICTs) by SMEs .....	11
1.3 ICT Status in Kenya .....	12
1.4 ICT Performance in Kenya .....	13
1.5 Statement of the Problem .....	14
1.6 Justification of the Study .....	16
1.7 Aim of the study .....	17
1.7.1 Specific objectives .....	17
1.8 Research Questions .....	18
1.9 Scope of the Study .....	18
1.10 Significance of the Study .....	20
1.11 Conceptual Clarifications .....	20
1.12 Organisation of the thesis .....	22
1.13 Summary .....	23
CHAPTER 2 .....	24
THEORETICAL FRAMEWORK .....	24

- 2.1 Introduction.....24
- 2.2 The Technology Acceptance Model (TAM).....24
- 2.3 The Organisational Theory (TOT).....26
- 2.4 The Diffusion of Innovation Theory (DOI). ....26
- 2.5 Unified Theory of Acceptance and Use of Technology (UTAUT) .....31
- 2.6 Task Technology Fit (TTF) Theory .....32
- 2.7 Socio-Technical Theory.....34
- 2.8 Theory of Reasoned Action (TRA).....36
- 2.9 Theory of Planned Behaviour (TPB) .....38
- 2.10 Decomposed Theory of Planned Behaviour (DTPB) .....39
- 2.11 Conceptual Framework Model .....42
- 2.12 Summary .....43
- CHAPTER 3 .....44
- LITERATURE REVIEW .....44
- 3.1 Introduction.....44
- 3.2 Drivers of ICTs Adoption by SMEs .....44
  - 3.2.1 External Drivers of ICTs Adoption by SMEs .....45
  - 3.2.2 Internal Drivers of ICTs Adoption by SMEs.....46
- 3.3 ICT Tools .....49
- 3.4 Barriers to ICTs Adoption by SMEs.....52
  - 3.4.1 External Barriers to ICTs Adoption in SMEs.....53
  - 3.4.2 Internal Barriers to ICTs Adoption.....61
- 3.5 Strategies to Lessen Barriers to ICTs Adoption by SMEs.....64
- 3.6 Benefits of ICTs Adoption by SMEs .....68
- 3.7 The Role of Government Support to SMEs.....72
- 3.8 Kenya National Information and Communication Technologies (ICTs) Policy .....75
  - 3.8.1 Challenges of ICT in National Development .....76
- 3.9 Summary .....78
- CHAPTER 4 .....80
- RESEARCH DESIGN AND METHODOLOGY .....80

4.1 Introduction.....	80
4.2 Research Design.....	80
4.2.1 Research Philosophy.....	81
4.2.2 Research Approach.....	82
4.2.3 Research Strategy.....	84
4.3 Research Methods.....	85
4.3.1 Secondary Data Collection.....	85
4.3.2 Primary Data Collection Methods.....	86
4.3.2.1 Observation Method.....	86
4.3.2.2 Interview Method.....	86
4.3.2.3 Focus groups Interview.....	87
4.3.2.4 The Survey Instrument.....	87
4.3.3 Target Population.....	89
4.3.4 Sampling Design.....	89
4.3.5 Determination of the Sample Size.....	90
4.4 Reliability and validity of data.....	93
4.4.1 Face validity.....	93
4.4.2 Convergent Validity.....	94
4.5 Data Analysis.....	94
4.5.1 Factor Analysis.....	94
4.5.2 Regression.....	95
4.5.3 Analysis of Variance (ANOVA).....	96
4.6 Research Ethics.....	96
4.7 Summary.....	97
CHAPTER 5.....	98
PRESENTATION OF FINDINGS.....	98
5.1 Introduction.....	98
5.2 Demographics of Respondents and Response Rate.....	98
5.3 Business Profile.....	100

5.4 Extent of ICT Readiness by Kenyan SMEs.....	102
5.4.1 Perception of Owners/Managers on Drivers of ICTs Adoption by SMEs .....	103
5.4.2 Usage of ICT Tools .....	106
5.4.3 Benefits of ICTs Adoption by SMEs.....	108
5.5 Barriers to ICTs Adoption by Kenyan SMEs .....	112
5.6 Strategies Used to Lessen the Barriers to ICTs Adoption by Kenyan SMEs .....	116
5.7 The Role of Government in Promoting the Use of ICTs by SMEs .....	120
5.8 Testing of Proposed Conceptual Framework Model on ICTs Adoption by SMEs .....	121
5.9 Summary .....	125
CHAPTER 6 .....	127
DISCUSSION OF FINDINGS .....	127
6.1 Introduction.....	127
6.2 Demographics of Respondents .....	127
6.3 Business Profile .....	128
6.4 Drivers of ICTs Adoption by SMEs .....	129
6.5 ICT Tools Used in SMEs.....	132
6.6 Benefits of ICTs Adoption by SMEs.....	133
6.7 Barriers to ICTs Adoption by SMEs.....	135
6.8 Strategies to Lessen Barriers to ICTs Adoption by SMEs.....	137
6.9 Role of Government Support to SMEs .....	140
6.10 Testing of the constructs in the Proposed Conceptual Framework Model .....	141
6.11 Summary .....	142
CHAPTER 7 .....	144
CONCLUSION AND RECOMMENDATIONS .....	144
7.1 Introduction.....	144
7.2 Summary of key findings.....	144
7.2.1 Drivers of ICTs adoption by SMEs .....	144
7.2.2 ICT Tools and Benefits of ICTs adoption .....	144
7.2.3 Barriers to ICTs adoption .....	145
7.2.4 Strategies to enhance ICTs adoption by SMEs .....	145

7.2.5 The Role of Government in ICTs adoption by SMEs. ....	145
7.2.6 Testing of relationship of the constructs in the Conceptual Framework Model .....	146
7.3 Conclusion .....	146
7.4 Contribution of the Study.....	147
7.4.1 Contributions to theory.....	147
7.4.2 Contribution to Methodology .....	149
7.4.3 Contributions for Policy and Practice.....	150
7.4.3.1 Policy Makers.....	150
7.4.3.2 Owners/Managers of SMEs.....	150
7.4.3.3 Institution of Higher Learning and other Tertiary Institutions .....	151
7.4.3.4 Financial Institutions .....	151
7.4.3.5 Non-Governmental Organisations.....	152
7.4.3.6 Training Consultants.....	152
7.5 Recommendations.....	152
7.6 Limitations of the Study.....	155
7.7 Directions of Future Research .....	156
7.8 Summary .....	157
REFERENCES .....	158
APPENDIX 1: QUESTIONNAIRE .....	180
APPENDIX 2: RESEARCH PERMIT .....	188
APPENDIX 3: RESEARCH AUTHORISATION, NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY, KENYA.....	189
APPENDIX 4: RESEARCH AUTHORISATION, Office of the President, Nakuru, Kenya	190
APPENDIX 5: RESEARCH AUTHORISATION, Ministry of Education, Nakuru, Kenya ..	191
APPENDIX 6: RESEARCH AUTHORISATION, Office of the President, Kisumu, Kenya	192
APPENDIX 7: RESEARCH AUTHORISATION, Ministry of Education, Kisumu, Kenya .	193

## LIST OF TABLES

Table 5.1	Demographics of the Respondents	100
Table 5.2	Business Profile	101
Table 5.3	Results of an Exploratory Factor Analysis on Drivers of ICTs Adoption by SMEs	103
Table 5.4	Results of owners/ Managers perceptions on Drivers of ICTs Adoption by SMEs	105
Table 5.5	Ownership, Age of Business and Drivers to ICTs Adoption by SMEs	106
Table 5.6	ICT tools used by SMEs	107
Table 5.7	Ownership, Age of Business and ICT tools	108
Table 5.8	Results on the Inter-Item correlation on Benefits of ICTs Adoption by SMEs	109
Table 5.9	Results on perceptions on Benefits of ICTs Adoption by SMEs	111
Table 5.10	Ownership, Age of Business and effect of Benefits of ICTs Adoption by SMEs	112
Table 5.11	Results of an Explanatory Factor Analysis on Barriers of ICTs Adoption by SMEs	113
Table 5.12	Results on perception of Owners/Managers on Barriers to ICTs Adoption by SMEs	115
Table 5.13	Ownership, Age of Business and Barriers of ICTs Adoption by SMEs	116
Table 5.14	Results on Inter-Item Correlation of Strategies to Lessen Barriers to ICTs Adoption by SMEs	117
Table 5.15	Results on perceptions of owners/Managers on Strategies to Resolve Barriers to ICTs adoption by SMEs	119
Table 5.16	Ownership, Age of Business and Strategies to ICTs Adoption by SMEs	120
Table 5.17	Role of Government support to SMEs	121
Table 5.18	Regression Results on the Impact of Drivers and Barriers on Usage of ICT tools	123
Table 5.19	Regression Results on the Impact of Usage of ICT tools on Benefits	125

## LIST OF FIGURES

Figure 1.1	Map of Kenya indicating the provinces of Kenya	19
Figure 2.1	Technology Acceptance Model	25
Figure 2.2	Roger's Theory	27
Figure 2.3	Unified Theory of Acceptance and Use of Technology	32
Figure 2.4	Task Technology Fit	34
Figure 2.5	Socio-Technical Theory	35
Figure 2.6	Theory of Reasoned Action	37
Figure 2.7	Theory of Planned Behaviour	39
Figure 2.8	Decomposed theory of Planned Behaviour (DTP)	41
Figure 2.9	Conceptual Framework Model	43
Figure 3.1	Drivers of ICTs adoption in SMEs	44
Figure 3.2	ICT tools	52
Figure 3.3	Barriers to ICTs adoption in SMEs	53
Figure 3.4	Strategies to lessen barriers to ICTs adoption in SMEs	64
Figure 3.5	Benefits of ICTs adoption in SMEs	68
Figure 4.1	The onion research process	80
Figure 4.2	Inductive approach	83
Figure 4.3	Deductive approach	84
Figure 7.1	Conceptual Framework ICTs Model	148

## LIST OF ABBREVIATIONS

ICTs	Information Communication Technologies
SMEs	Small and Medium Enterprises
KICT	Kenya Information Communication and Technologies
NICT	National Information Communication and Technologies
ISPs	Internet Service Providers
KCSE	Kenya Certificate of Secondary Education
KCPE	Kenya Certificate of Primary Education
PU	Perceived Usefulness
PEOU	Perceived Ease of Use
TAM	Technology Acceptance Model
TFT	Task Fit Technology
TRA	Theory of Reasoned Action
DOI	Diffusion of Innovation Theory
UTAUT	Unified Theory of Acceptance and Use of Technology
TOT	The Organisation Theory
OECD	Organisation for Economic Cooperation and Development
GDP	Gross Domestic Product
UNDP	United Nations of Development Policy
VAT	Value Added Tax
HIV	Human immunodeficiency Virus
AIDS	Acquired Immune Deficiency Syndrome
NCST	National Council of Science and Technology
KIRDI	Kenya Industrial Research Development Institute
KIE	Kenya Industrial Estate
PCK	Productivity Centre of Kenya
NYS	National Youth Service
KBS	Kenya Bureau of Standards
EAC	East African community
KP&TC	Kenya Posts and Telecommunications
MFTF	Micro Finance Trust Fund
MESPT	Micro Enterprise Support Programme Trust
CCK	Communications Commission of Kenya
NCS	National Communication Secretarial services
TOL	Temporary Occupancy Licenses

## CHAPTER 1

### BACKGROUND INFORMATION

#### 1. Introduction

The study focuses on the “Adoption of Information Communication Technologies in Kenyan SMEs”. This first chapter is divided into the following sub-sections: background of the study which covers the nature of SMEs, characteristics of SMEs, role of SMEs, challenges, potential use of ICTs by SMEs, ICT status and performance in Kenya. The chapter also provides the statement of the problem, justification of the study, aim of the study, research questions, scope of the study, significance of the study, conceptual clarifications, organisation of the thesis and summary.

#### 1.1 Background to the Study

##### 1.1.1 Nature of SMEs

There is no universally acknowledged definition of Small and Medium-sized Enterprises-SMEs (Mutula and Brakel, 2006:403; Mbogo, 2011). The definition of SMEs varies from country to country. However, the definition is often based on employment and assets, or a combination of the two. For instance, the Organisation for Economic Co-operation and Development (OECD) defines SMEs as enterprises that have less than 500 employees (OECD, 2004). Countries such as USA, Britain, and Canada define SMEs in terms of annual turnover and the number of paid employees. In Britain, SMEs are defined as enterprises with an annual turnover of 2 million pounds or less and with fewer than 200 paid employees. In Japan, SMEs are defined as those in manufacturing with 100 million yen paid-up capital and 300 employees, and those in the retail and services trade with 10 million Yen paid up capital and 50 employees. In Australia, SMEs are defined as enterprises with 5 to 199 employees (Kotey and Folker, 2007), whereas in Indonesia SMEs are business enterprises with 5 to 99

employees (Mira, 2006:72). In Kenya, SMEs are defined as those enterprises that employ 11 to 100 workers (Moyi, 2003:223; Migiro and Wallis, 2006; Kimwele, Mwangi and Kimani, 2010; Wanjau, Gakure and Kahiri, 2010; Nganga, Onyango and Kerre, 2011 and Mokaya, 2012). For the purpose of this study, the last definition will be used.

### **1.1.2 Characteristics of SMEs**

SMEs are generally distinguished by the nature of their production and management arrangements, trading relations, financial practices, and internal competence. SMEs are not a homogeneous set of businesses; they are a heterogeneous set of businesses usually operating in service, trade, agri-business, and manufacturing sectors. SMEs include a wide range of firms such as village handcraft makers, small machine shops and computer software firms (Lukacs, 2005:3). They vary in size, age, sector, motivation, mode of organization, ethnic background, location, knowledge base, power and control of resources and innovative capacity (Vivienne and Roberts, 2005:522; MacGregor and Vrazalic, 2006).

Some studies (Sharma and Bhagwat, 2006; Bunker and MacGregor, 2000) have examined the differences in the management style between large businesses and SMEs. These studies have shown that, among other characteristics, SMEs tend to have a small management team (often one or two individuals). In addition, the management style of SMEs is strongly influenced by the owner and the owner's idiosyncrasies. SMEs owners/managers have little control over the business environment although they desire to remain independent (Dennis, 2000:289; Drakokoplon-Dodd, Jack and Anderson, 2002:212).

### **1.1.3 Role of SMEs**

Small and Medium Enterprises (SMEs) play an important role in all the economies of the world (Mira, 2006:70; Wolcott, Mehrnaz and Qureshi, 2008; 616 and Nganga *et al.*, 2011). In

developing countries, SMEs are the major sources of income, a breeding ground for entrepreneurs and a provider of employment (Thurik and Wennekers, 2004; Hashim, 2007; Berisha-Namani, 2009; Mbogo, 2011; Nganga *et al.*, 2011 and Okpara, 2011). The SMEs contribute to job creation, income generation and distribution (Temtime and Pansiri, 2006:55; Machacha, 2002:277; Lange, Ottens and Taylor, 2000:6; Apulu and Ige, 2011).

In India, for instance, SMEs have been consistently out-performing large companies on crucial parameters such as growth in production and employment; the sector accounts for 40 percent of the industrial production, 35 percent of the total exports and provides about 80 percent of employment in the industrial sector in the country (Sharma and Bhagwat, 2006). In Botswana, SMEs have contributed greatly in job creation and in promoting social economic development (Mutula and Brakel, 2006:403).

Other countries where SMEs have created jobs include Singapore, Hong Kong, Malaysia and Turkey. In Singapore, 51 percent of the total workforce is employed in the small and medium-scale sector, and in particular, SMEs in the manufacturing sector account for 15 percent of Gross Domestic Product (Lukacs, 2005:4). In Hong Kong, SMEs are the largest employers with over 1.4 million people while in Japan 81 percent of the employment are in SMEs sector (Lukacs, 2005:2). In Turkey, SMEs have created jobs to the tune of 79.7 percent of the total employment and 38 percent of the total value added tax is contributed by SMEs (Coskun and Altunsik, 2002). Similarly, SMEs have contributed in improving the adaptability of the economy by changing the market conditions and forces. In addition, SMEs supply the necessary raw materials, semi manufactured materials to large firms, and in return, SMEs get money which assists SMEs in the adoption of new technologies. In Malaysia, SMEs account for more than 80% of total manufacturing establishments and also account for about 35% of the total workforce employed in the manufacturing sector (Hashim, 2007). Currently, SMEs in Malaysia employ about 5.6 million people; contribute 32% to Malaysian

gross domestic product and 19% of the total exports of the nation (Selemat, Jaffer and Abd Kadir, 2011).

In Africa, there is the impetus for the creation of strong small business sectors as engines of economic growth, and this impetus is supported by international lending agencies (Mutula and Brakel, 2006:403). SMEs employ more than 40 percent of all new entrants to the labour force because they tend to be more labour intensive than large firms and thus better placed to alleviate unemployment (Muuka, 2002:2). In South Africa, specifically, SMEs undertakings create about 80 percent of all new jobs (Moodley, 2001 and Modimogale and Kroeze, 2011).

#### **1.1.4 Small and Medium Business Enterprises in Kenya**

A baseline survey conducted in Kenya in 1999 indicated that SMEs employed 2.4 million people, constituting 18 percent of the total workforce (Lukacs, 2005). In 2003, the sector employed 5.1 million people, accounting for 74 percent of total employment in Kenya. Similarly, in 2009, small and medium enterprises sector contributed 18 percent of Gross Domestic Product (GDP) of the economy (Kenya, 2009). In addition, this sector contributed 87 percent of all the new jobs created and it employed 77 percent of the total number of the workforce.

SMEs in Kenya contribute a lot in terms of gross domestic product, income distribution and creation of employment (Mbogo, 2011). Further, SMEs are also considered as seedbeds for medium and large entrepreneurs; contribute more to balanced socio-economic development especially in supplying products and services previously not available in the market place (Mokaya, 2012). Despite all these contributions SMEs are faced with many challenges like inaccessibility to financial services, deficiencies in technical and management skills, dilapidated infrastructure, and an increasingly volatile input and output market (Kenya, 2009; Bowen, Morara and Mureithi, 2009). In addition, Kenyan SMEs operate in an environment

characterised by fragmented and incomplete information, where awareness of markets, technology, policy regulations and finance is limited (Mokaya, 2012). In recognition of the importance of the sector, in 2003 the Kenyan government created SMEs policy framework. The framework placed the development of SMEs to be in line with the national economic growth goals, employment creation, income generation, and poverty reduction. The SMEs in Kenya are therefore important in the national economic framework in Kenya.

### **1.1.5 Challenges facing SMEs Development and Competitiveness**

The challenges faced by SMEs include limited access to manufactured inputs, especially high quality imported goods, and lack of skilled human capital to exploit and improve ICTs within the business (Mutula and Brakel, 2006:403; UNDP, 2006:1). In addition, lack of managerial skills, lack of finance, lack of market information and commercial intelligence gathering have been identified in the continuum of challenges facing SMEs (Qiang, Clarke and Hakewood, 2006; Zhang and Morrison, 2007:277; Coskun and Altunisk, 2002:273). SMEs are also faced with problems of small markets, inadequate regional integration, poor infrastructure, bad governance, legal and administrative hindrances and failure to access credit (Bowen *et al.*, 2009:22).

Although SMEs contribute significantly to the Kenyan economy, the Kenyan SMEs have continued to experience challenges which perhaps make SMEs not to contribute enormously to the economy (Kenya, 2005). These challenges include poor access to the market network, lack of financial services, unfavourable policy, legal and regulatory framework, and HIV and AIDs pandemic, among others.

One of the challenges is lack of managerial training and experience. Most owners/managers lack managerial training and experience in business which is critical in the survival and growth of SMEs in the era of globalisation. Lack of managerial experience in business and

entrepreneurship has negatively impacted on the survival of SMEs in Kenya (Kenya, 2005). Owners/managers need to have necessary managerial skills so that they would be in a position to formulate strategies of the business. In addition, owners/managers need to understand how to motivate their employees.

Secondly, SMEs lack credit and financial services. Lack of credit facilities has brought about failure to adopt information communication technologies (ICTs) in their business processes. This has encouraged SMEs to continue using inappropriate technology in their business processes, thus making them not to be strategically positioned in this era of competition (Wanjau, Macharia, and Ayodo, 2012; Wolcott *et al.*, 2008). Credit facilities are considered an enabling factor in SMEs in the use of modern technologies in their business.

There are other financial challenges faced by SMEs, especially the high cost of credit, high bank charges and exorbitant commitment fees. These challenges inhibit SMEs strategic competitiveness especially in product development, training of human capital and gathering of market intelligence information. Furthermore, there is no structured institutional mechanism to facilitate the flow of financial resources from the financial sector to SMEs. The need for collateral which is usually demanded by financial institutions to secure loans has further compounded the problems of securing financial resources. Adequate financial resource is critical for the sustainability, growth and development of SMEs (Okpara and Pamela, 2007; Kenya, 2005).

A third challenge is poor infrastructure. Poor infrastructure is a critical factor that constrains businesses in the Kenyan environment, especially SMEs. The road network in Kenya is in bad shape which makes the cost of production, manufacturing, and services high. The poor infrastructure limits SMEs from fair competition with other businesses, especially those with cheap imported substitutes. In addition to this, SMEs have problems in accessing land,

workspace, feeder roads, electricity and utilities which are considered essential conditions of good business environment (Kenya, 2005). These infrastructural facilities are critical for the growth and development of SMEs.

Additionally, SMEs have a limited access to markets. Access to markets and marketing intelligence is a major driver for the survival, growth and development of SMEs in a competitive environment. Kenyan SMEs are faced with competition for the limited market available caused by dumping of goods from developed countries. In addition, there is an over-production of goods without conducting comprehensive market research or gathering of market intelligence information to justify market needs.

Market intelligence information enables SMEs to understand consumer needs and to try to satisfy these needs without misuse of the scarce resources. Market intelligence information also aids SMEs owners/managers to have a holistic understanding of competitor's policies and strategies in the business environment. These strategies can enable SMEs to penetrate the market with the right approaches using the right market intelligence information and to develop their own new strategies to counter the competitors. SMEs are also faced with the problem of gathering intelligence information on market dynamics and this makes SMEs to be ill-prepared to compete in liberalised markets and dynamic business environment (Kenya, 2005 and Mbogo, 2011).

A further challenge facing SMEs is the limited access to and under utilization of information. Lack of sufficient information poses a great challenge to SMEs. SMEs are not in a position to compete with large enterprises globally because of lack of acquisition of information and capacity to interpret and effectively utilise the information to benefit SMEs in sustainability and development. Failure to access timely, simplified, relevant information on market opportunities, production technology and government regulations affect SMEs such that they

are not in a position to survive and compete with other businesses in the hyper turbulent environment (Kenya, 2005). One essential area where limited access to information inhibits SMEs owners/managers' decision-making is with regard to either adopting or not to adopting ICTs in their business. The managers may not be aware of the benefits of ICTs adoption in their business process. Adequacy of information accessibility would enable SMEs owners/managers to make informed decisions whether to adopt or not to adopt ICTs in their business.

SMEs also face an unfavourable taxation policy. Development and growth of SMEs in Kenya is constrained by the existing taxation policy. For instance, taxes from Value Added Tax (VAT) increase transaction costs in the process making SMEs products and services costly and as an effect, lowering profit margins. Furthermore, the delay in import and export clearance of SMEs' products reduces the productivity and competitiveness of SMEs in the country (Kenya, 2005).

Moreover, another inhibiting challenge is inadequate access to skills and technology. Most SMEs in Kenya are characterised by restricted levels of technology, inappropriate technology and inadequate institutional capacity to support infusion of modern technology in their business processes. SMEs are also faced with the problem of lack of information to aid this industry in accessing international markets to sell their products. SMEs owners/ managers lack technical services to advise SMEs on the importance of ICTs adoption in their business. A number of researchers concur with the idea that ICTs adoption by SMEs will aid SMEs to gather adequate and relevant market intelligence information which would facilitate new ways of managing and organising business activities (Tan, Chong, Lin and Eze, 2010 and Kenya, 2005).

The HIV and AIDS is also a major challenge to SMEs. The HIV (Human immunodeficiency Virus) and AIDS (Acquired Immune Deficiency Syndrome) pandemic has really affected many business enterprises in different ways. For instance, HIV and AIDS has had adverse effects on SMEs in terms of productivity, skilled manpower, and economic burden which have led to skewed concentration of resources against productive activities. These negatively affect the operation of SMEs especially when it is noted that SMEs have inadequate financial resources. HIV and AIDS has led to high mortality rates of employees, high labour costs as a result of high absenteeism, inability of affected enterprises to meet their daily business obligations. Furthermore, these problems are complicated by lack of medical facilities to treat the affected employees.

Along the same lines of argument, it is worth noting that human capital attraction and retention in any business is one of the critical factors for SMEs survival, growth and development. The natural attrition of employees of SMEs by this calamity affects the operation of SMEs. Although, the government and SMEs management have done a lot to create awareness of HIV and AIDS, SMEs are still highly affected by the pandemic in Kenya (Kenya, 2005). Human capital retention is critical for ICTs adoption in SMEs. For instance, owners/managers may decide to adopt ICTs in their business processes but lack of human capital with ICTs related skills may impede the process of ICTs adoption.

May be due to their small nature, SMEs are faced with challenges emanating from technological changes. Many SMEs have been affected by changes in technology. Firstly, many SMEs appear to be unfamiliar with new technologies. Secondly, even where SMEs know about the existence of new technology, this technology may not be locally available or it may be unaffordable and unsuitable to local conditions of SMEs. Perhaps, this makes SMEs not to adopt ICTs in their business process (Esselaar, Stork, Ndiwalana and Deen-

Swarray, 2007 and Kenya, 2005). The changes of technology have, therefore, brought many challenges to SMEs.

Penultimately, SMEs face an unfavourable policy environment. Lack of favourable policy environment has affected the operations of Kenyan SMEs. The major issue is the inappropriate policy design and implementation. Most policies are formulated without proper consultation by owners/managers of Kenyan SMEs. Lack of consultation with other stakeholders might lead to failure in the implementation process. It would be argued that most policies fail to take off because they do not address specific needs of SMEs. There is also lack of ownership of policy implementation because initially SMEs owners/managers were not consulted. This problem is further compounded by lack of follow-ups in the implementation and a lack of role clarity with other stakeholders. In addition, there is poor coordination of activities and sub-optimisation of the main purpose of the policies in SMEs.

Finally, one other challenge facing SMEs is the inhibition as a result of the legal and regulatory environment. The legal and regulatory environment is critical for the growth and development of SMEs. SMEs play an important role in the economy especially in job creation and poverty eradication. Nevertheless, SMEs are operating in an unfavourable legal and regulatory environment. Most of the by-laws applied by local authorities in Kenya are not standardised and to some degree, would appear punitive to the SMEs sector (Kenya, 2005). Similarly, the role played by provincial administrations tends to conflict with the local authorities. The issue of centralisation of most activities in the capital city tend to disadvantage some of the SMEs which are in the rural areas. As a result most of the entrepreneurs operate their businesses informally.

## **1.2 Potential Use of Information and Communication Technologies (ICTs) by SMEs**

The term Information and Communication Technologies (ICTs) is defined in a broad sense as technologies dedicated to information storage, processing and communication (Rao, 2004:262). According to Martyn, Amanda, and James, (2003:307), ICTs constitute a range of software, hardware, telecommunication and information management technologies, applications and devices that are used to create, analyse, package, distribute, retrieve, store and transform information. Thus, ICTs are organized communication networks and data resource that collect, transform and disseminate information within and among organizations (Seyal, Rahim, and Rahim, 2000; Sharma and Bhagwat, 2006; Apulu and Latham, 2012).

Adoption of Information and Communication Technologies (ICTs) provides many benefits across a wide range of intra- and inter-firm business processes and transactions. ICTs adoption improves information and knowledge management inside the firm and can reduce transaction costs and increase the speed and reliability of transactions for both business-to-business (B2B) and business-to-consumer (B2C) transactions. In addition, ICTs are effective tools for improving external communications and quality services for established and new customers (OECD, 2004:1).

ICTs infrastructure can enable SMEs to engage in electronic commerce. Electronic commerce will assist SMEs in increasing their efficiency in day-to-day business operations and sustain their business growth through the opening of new market channels.

Access to information is a critical factor for the success and survival of SMEs in the global market (Rasmussen, 1997). Through the effective use of ICTs tools, SMEs are then able to sell their products to international markets and favourably compete with large corporations (Ramsay, Ibbotson, Bell and Gray, 2003). Thus, information and communication

technologies can be used as a strategic weapon to underpin the business strategy of SMEs (Maguire, Koh and Magrys, 2007).

ICTs enhance SMEs efficiency, reduce costs, and broaden market reach, both locally and globally. Since the SME sector plays a major role in national economies, these factors collectively translate into positive results in the form of job creation, revenue generation and overall national competitiveness. Governments, therefore, have an interest in the promotion of access to and use of ICTs by SMEs (Mutula and Brakel, 2006).

The adoption of ICTs in SMEs has immense benefits for SMEs. However, a number of factors hinder SMEs from fully realising the benefits of ICTs, including lack of knowledge, resources and trust in using ICTs. There are a number of other challenges faced by SMEs in different countries. For instance, Kenyan SMEs are faced with problems of limited access to markets, finance and e-commerce technologies (Migiro, 2006). It can easily be concluded that the productivity of Kenyan SMEs has remained low over the years due to multiple challenges such as lack of awareness, inaccessibility to global markets due to fragmented and incomplete information, technology, policy regulations and lack of a strategic vision (Migiro, 2006; Moyi, 2003; Martin and Matlay, 2001; Miller and Besser, 2000).

### **1.3 ICT Status in Kenya**

Countries that have harnessed the potential use of ICTs have attained significant growth in social and economic development (Kenya, 2006). The Kenyan government has recognised the need for ICTs sector development as one of the interventions for social and economic development in the era of globalisation.

The ICTs sector in Kenya is relatively young. In 1999, the government of Kenya liberalised the telecommunication sector after realising the need for the ICT sector as an intervention for Kenya's development. Recently, Kenya witnessed significant growth in the ICT sector

(Kenya, 2006). This has been demonstrated by the growth of telephone lines, Internet Service Providers (ISPs), the number of internet users, broadcasting stations. Furthermore, the government has liberalised the mobile cellular market and, as of 2011, there were four mobile cellular operators in Kenya. The available statistics as per the National Information Communication Telecommunications (NICT) policy, (Kenya, 2006) indicated that by June 2006, Kenya had 260,000 fixed telephone line subscribers and 3 million mobile subscribers, 73 registered internet service providers (ISPs). 16 of the ISPs are active, with approximately 1,030,000 users and over 1000 cyber cafes and telephone bureaus, 16 television stations, and several FM radio stations which are operational. An estimated 60 percent of the population have access to television, while 90 percent have access to the radio station (Kenya, 2006).

#### **1.4 ICT Performance in Kenya**

From the year 1999, the fixed-line telephony sector in Kenya has grown steadily due to the liberalisation of the telecommunication sector. This intervention was used by the Kenyan government to ensure that the fixed-line telephony sector is enhanced. For instance, in the year 2005-2006 financial year the number of fixed telephone subscribers increased from 278,867 in June 2005 to 303,905 in June 2006. The number of telephone lines increased because of the liberation approach used by the government. Similarly, the numbers of Telkom subscribers was projected to increase due to the recent launch of Telkom Wireless (Kenya, 2005).

The mobile cellular sector has experienced phenomenal growth in the past four years. In the year 2006, there were two mobile cellular operators in the Kenyan market. These cellular operators were Safaricom Ltd. and Celtel (Zain) international. But from 1999, the two companies experienced a growth rate of 27.5 percent per year. Currently, there are four cellular operators namely Safaricom Ltd, Airtel, Orange and Yu (Essalar Telecom). Thus, the mobile cellular industry is expected to continue experiencing high growth (Kenya, 2005).

The number of mobile subscribers has for example increased from 9.3 million in 2007 to 12.9 million in 2008 (Tilvawala *et al.*, 2009).

As of 2011, there were 73 licensed internet service providers (ISPs) with an estimated customer base of one million users. The internet penetration within Kenya remains low, compared to the global benchmarks; similarly the internet growth sector in Kenya is constrained due to lack of adequate infrastructure (Kenya, 2005; Kariuki, 2009). The International Telecommunication union estimated in the year 2001 that Kenya had 175,000 computers. This clearly demonstrated that the demand for computers keeps increasing. However, the government encouraged the use of computers by withdrawing customs duty on personal computers (PCs), thereby making them affordable. This led to the increase of PCs to 520,000 by the year 2004. Similarly, poor rural electrification has contributed negatively to the low levels of usage of personal computers and internet penetration in Kenya especially in rural areas. Internet users in 2008 were 3,000,000 as compared to 200,000 in 2000 (Tilvawala *et al.*, 2009).

### **1.5 Statement of the Problem**

Many SMEs fail to be competitive because of several factors. Such factors include: non-adoption of ICTs, finance, and lack of access to international markets, poor infrastructure, ill-defined legal framework and managerial skills.

Previous researchers (Tsiu-Auch, 2003; Martin and Matlay, 2001; Fallon and Moran, 2000) posit that dissemination and assimilation of ICTs in SMEs especially in Africa is lacking. Many of the innovative ideas, theories and perspectives pertaining to the understanding of ICTs use in SMEs ideally reflect the views of the West. Perhaps, this is partly because most of the Information Technology models have been developed in the west. Some of these theories were Technology Acceptance Model (TAM) (Davis, Bagozzi and Warsaw, 1989),

Diffusion of Innovation Theory (DOI) (Rogers,1995), The Organisation Theory (TOT) (Avgerou and Conford,1998), Unified Theory of Acceptance (UTUAT) (Venkatesh,Morris,Davis and Davis,2003), Task Technology Fit Theory (TTFT) (Goodhue and Thompson,1995), Social Technology Theory (STT) (Bostrom and Heinen,1977), Theory of Reasoned Action (TRA) (Ajzen,1991), The Theory of Planned Behaviour (TPB) (Fishbein and Ajzen,1975) and Decomposed Theory of Planned Behaviour (DTPB) (Taylor and Todd,1995). These theories assist in the prediction of ICTs adoption by businesses. Despite all these theories there is need for one to revise or modify or develop or extend these theories to assist in the prediction of ICTs adoption by SMEs in the developing countries context. Furthermore, other researchers have indicated that there is need to explore how ICTs could be used in SMEs to enhance their performance and competitiveness (Sharma and Bhagwat, 2006).

Information is a crucial resource in gaining sustainable competitive advantage for modern business enterprises (Obura, Majanja, Linda and Odongo, 2007; Stockdale and Standing, 2004). However, despite this importance, Kenyan SMEs still operate in a business environment characterized by fragmented and incomplete information, limited awareness of markets, policy regulations and access to finance (Moyi, 2003; Zhang and Morrison, 2007). Thus, many SMEs are struggling for survival, with more emphasis placed on short-term profits rather than on growth and long-term competitiveness (Helen, Ronab, and Dolores, 2003).

Ramsay *et al.*, (2003) state that analyses of ICTs use in SMEs is under researched, conceptually confused and widely generalised. Mira (2006) also suggests that there is need for a framework that will help SMEs to adopt ICTs. SMEs in developing countries have failed to adopt ICTs due to lack of research on strategies to overcome the adoption barriers (Kapurunbandara and Lawson, 2006:2). For this reason, this study focused on ICTs adoption

by Kenyan SMEs and suggests an appropriate framework to overcome the potential barriers to adoption.

### **1.6 Justification of the Study**

Although, a number of studies have been conducted on ICTs' adoption in SMEs in developed countries, few studies have been done in developing countries (Matambalya and Wolf, 2001; Moyi, 2003; Mutula and Brakel, 2006; Middleton and Byus, 2011). While many approaches have been developed in ICTs adoption over the last 20 years, all have been designed for large organisations and not for SMEs (Maguire *et al.*, 2007; Frederici, 2009). Most previous studies conducted are also concentrated in the West; SMEs in the less developed countries are under researched. In addition, the existing studies have concentrated on the reasons for adoption of ICTs rather than on the rejection of ICTs in SMEs. Also, the existing literature has highlighted the challenges faced by SMEs that need to be addressed. This study, therefore, envisages developing a framework of ICTs adoption that addresses the reasons for ICTs adoption and rejection in the less developed countries, particularly in Kenya.

Research indicates that there is a limited usage of internet in developing countries (Pavic *et al.*, 2007). This study was therefore undertaken to find out the causes of low usage of internet in developing countries compared to the usage of internet by SMEs in developed countries. Similarly, the study would recommend the necessary interventions to be pursued to promote the usage of internet by SMEs in developing countries.

ICTs contribution to business operations in general is high. However, studies in SMEs indicate that there are a large number of unsuccessful ICTs adoptions (Nguyen, 2009). There is a misconception too on the usage of ICTs and most of the SMEs owners/ managers are uncertain about the potential benefits of ICTs. The study proposes appropriate measures that

can be applied to enhance ICTs adoption by SMEs in developing countries. Furthermore, the study posits the benefits of ICTs adoption by SMEs.

Most studies have concentrated on the benefits of Information Communication Technologies adoption by SMEs (Mutula and Brakel, 2006; Chiware and Dick, 2008). However, a number of studies do not address the enablers and inhibitors of Information Communications Technologies in SMEs in developing countries, and specifically in Kenya. Therefore, this study addresses the contribution of the enablers and inhibitors of ICTs adoption in Kenyan SMEs.

### **1.7 Aim of the study**

The thesis is titled, "Adoption of Information Communication Technologies (ICTs) in Kenyan Small and Medium Enterprises (SMEs)". The general aim of the study was the assessment of ICTs adoption and assimilation in Small and Medium Enterprises in Kenya. This would enable the researcher in testing and verifying the conceptual framework developed. The aim of the study led to the development of five specific objectives.

#### **1.7.1 Specific objectives**

To achieve the general aim of this study, the following specific objectives were pursued:

1. To explore ICTs adoption readiness in Kenyan SMEs.
2. To investigate the barriers faced by SMEs in the adoption of ICTs in Kenya.
3. To identify strategies to reduce barriers facing SMEs in the adoption of ICTs, in Kenya.
4. To examine the role of government support on ICTs use by business enterprises in Kenya.
5. To test a proposed conceptual framework of the adoption of ICTs by SMEs.

## **1.8 Research Questions**

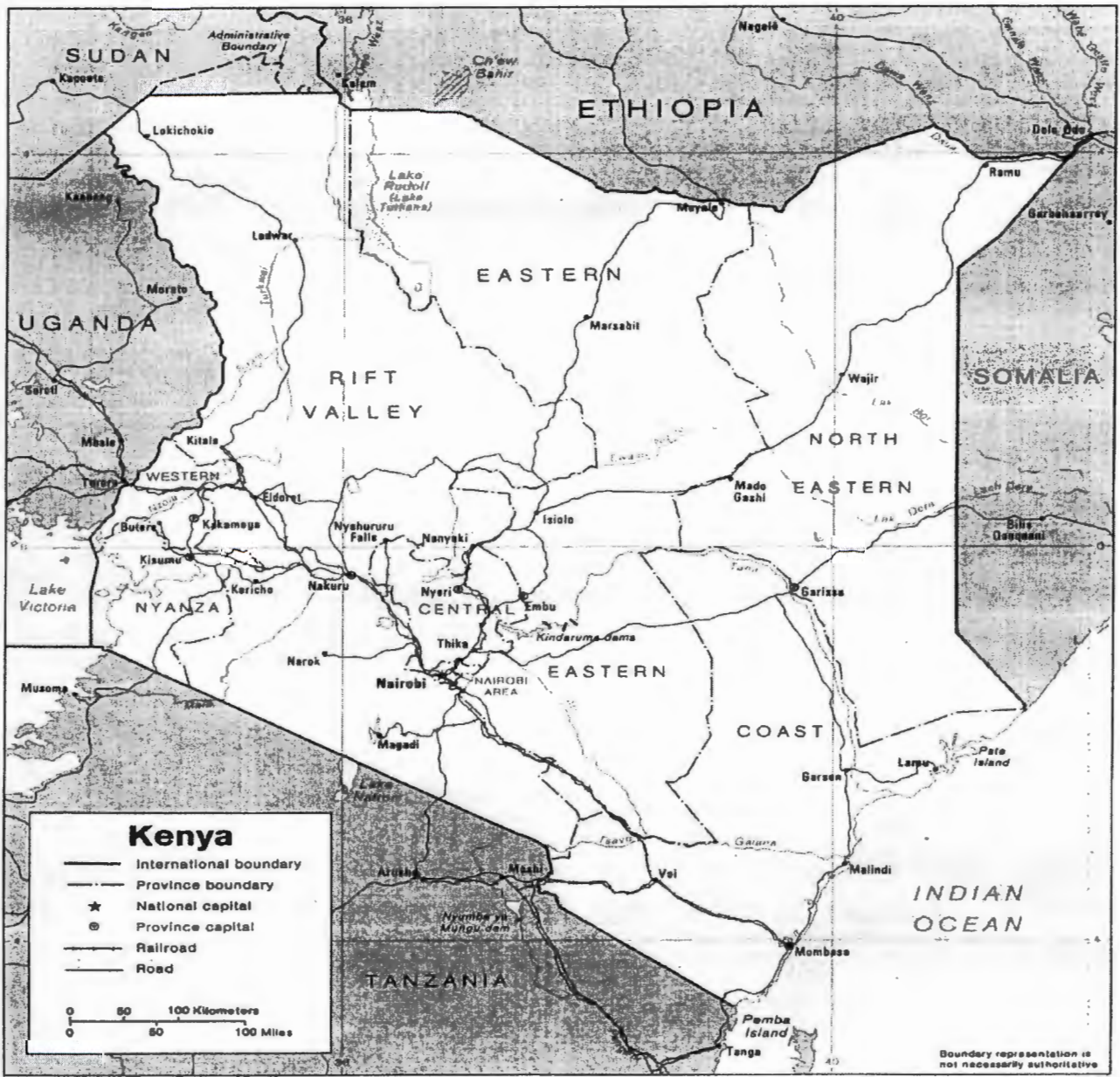
The research questions of the study were:

1. To what extent are SMEs in Kenya ready for ICTs adoption?
2. What are the barriers faced by SMEs in adopting ICTs in Kenya?
3. What strategies could be used to reduce barriers facing the adoption of ICTs in SMEs in Kenya?
4. What is the role of the government in promoting the use of ICTs by SMEs?
5. What is the relationship of various elements of ICTs adoption proposed in the conceptual framework of SMEs?

## **1.9 Scope of the Study**

This study covered SMEs located in three Kenyan provinces - Nairobi, Nyanza and Rift valley. The Provinces in Kenya are as indicated in figure 1.1. These provinces were selected for the study because of high concentration of SMEs. The study focuses on Manufacturing SMEs comprising furniture-wood, metal and fabrication sub-sectors. The SMEs selected in these provinces have also used ICTs in their business.

Figure 1.1 Map of Kenya showing the provinces.



Source: <http://www.Shorttravel.com/Kenyamap.html> (Accessed on 25/1/2008)

### **1.10 Significance of the Study**

This study will contribute to existing knowledge in ICTs usage through developing a conceptual framework model to be used by SMEs owners/managers in ICTs adoption. The framework would assist SMEs owners/managers to have a holistic understanding of core constructs which one needs to consider in the process of ICTs adoption. For instance, the framework is based on four key elements which are critical in understanding the process of ICTs adoption by SMEs. The key elements include: the drivers of ICTs adoption by SMEs, the barriers to ICTs adoption, ICT tools and benefits for adoption by SMEs. Furthermore, the framework would inspire owners/managers to holistically understand the drivers behind SMEs' adoption of ICTs. In addition, this framework will compel SMEs owners/managers to understand and appreciate the role of external drivers that influence the process of ICTs adoption. Similarly, the study would facilitate an understanding that the process of ICTs adoption in SMEs is faced by many challenges which impede the adoption process.

The challenges need to be understood by SMEs owners/managers in order for them to develop appropriate strategies to lessen barriers to ICTs adoption and enhance the degree of ICTs adoption by SMEs. Further, owners/managers need to understand and appreciate the importance of ICTs adoption in their business. One such importance is in relation to accessing international markets and gathering market intelligence to aid the SMEs owners / managers in making critical marketing decisions.

### **1.11 Conceptual Clarifications**

**Small and Medium Enterprises (SMEs):** "Micro enterprises" are those businesses in both formal and informal sectors which employ 10 or fewer workers. "Small enterprises" have employees from 11-50 and "Medium Enterprises" are those businesses which employ

between 51-100 people (Mwiti,Ofafa,and Jagongo, 2013). Therefore, SMEs are business enterprises which employ between 11-99 employees.

**Information Communication Technologies (ICTs)** - ICTs refers to the increasing range of new information and communication technologies which include telecommunication, computing and microelectronic (Opiyo and K'Akumu, 2006). In addition, the term includes information collection, manipulation, transmission, storage and presentation to the end users.

**E- Business** – E-business refers to a secure, flexible and integrated approach to delivering differentiated business value by combining systems and processes that own core business operations with simplicity and reach made possible by internet technology (Pavic, Koh, Simpson, Padmore, 2007). In addition, the term E-business means the use of internet technology and other ICTs tools to increase business and performance success.

**E –Commerce.**-E-commerce means the production, distribution, marketing sale or delivery of goods and services by electronic means (Kaynak, Tatoglu, and Kula, 2006). It also means the buying and selling of products and services by businesses and consumers over the internet.

**E-readiness** -This is an assessment of how ready the country is to participate in the networked world in order to become a knowledge society and economy. Thus, E-readiness is the sum of numerous factors or elements that determine the readiness in terms of areas deemed critical for ICTs adoption.

**Barriers** – Barriers are the factors that impede the process of ICTs adoption by SMEs. SMEs tend to adopt ICTs in their business process but they face many challenges which inhibit the process of ICTs adoption.

**Drivers** - These are factors which influence ICTs adoption by SMEs. SMEs are forced to adopt ICTs in their business processes because of the internal and external forces. For instance, an internal force includes internal organisation and an external force includes such aspects as technological change and government policy.

## **1.12 Organisation of the thesis**

The thesis is structured so as to provide an insight on the problem investigated. It includes background of the study, theoretical framework, research methodology, presentation of findings, discussion and interpretation of the findings and finally, the conclusion and recommendations of the study. The thesis comprises seven chapters.

**Chapter 1** deals with the background to the study which includes the statement of the problem, justification of the study, objectives of the study, research questions, and scope of the study, significance of the study, conceptual clarification and organisation of the thesis.

**Chapter 2** presents the theories which underpin the study and the theoretical framework suggested. The theories discussed in this chapter include: Technology Acceptance Model, Diffusion Innovation Theory, Task Technology Fit Theory, Social Technical Theory, Theory of Reasoned Action, and Theory of planned Behaviour, as well as the Decomposed Theory of Planned Behaviour.

**Chapter 3** presents a review of relevant literature as informed by the research objectives. The literature is analysed, synthesized, integrated and discussed.

**Chapter 4** outlines the design and methodology adopted for the study. The chapter covers the research design adopted for the study, the philosophy, research methods, target population, the sampling design, reliability and validity of data, data analysis and ethical considerations.

**Chapter 5** presents the results of data analysis based on the research objectives. The research objectives include the extent of ICTs readiness by Kenyan SMEs, barriers to ICTs adoption, strategies used to lessen barriers to ICTs adoption, the role of government in promoting the use of ICTs by SMEs. The chapter also considers testing the relationships of constructs in the ICTs adoption model by SMEs.

**Chapter 6** presents the discussion of the major findings of the study in the light of existing research.

**Chapter 7** provides the conclusion of the thesis based on the summary of major findings of the study. It highlights the contribution of the study. Finally, recommendations and the future research direction in the use and assimilation of ICTs by SMEs is presented.

### **1.13 Summary**

This chapter has highlighted the background of the study which includes the nature of SMEs, characteristics of SMEs, role of SMEs, challenges facing SMEs competitiveness, potential uses of ICTs in SMEs, ICTs status in Kenya and ICT performance in Kenya. Furthermore, the chapter has also discussed the statement of the problem, justifications, and the aim of the study, research objectives and questions of the study. The chapter has also explained the scope of the study, the conceptual clarifications and the organisation of the thesis. Chapter 2 that follows presents in detail the theories which underpin the study and the conceptual framework proposed that would help to understand the process of Information Communication Technologies adoption by SMEs.

## CHAPTER 2

### THEORETICAL FRAMEWORK

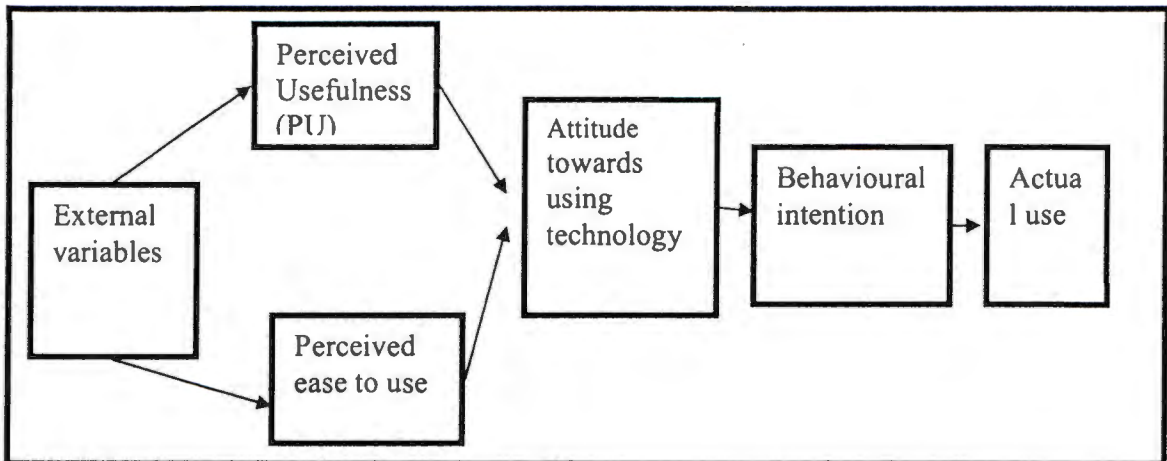
#### 2.1 Introduction

There are various theories and models in the literature that have informed studies on ICTs adoption by SMEs. These theories include: Diffusion of Innovation Theory (Rogers, 1995), Technology Acceptance Model (Davis *et al.*, (1989), The Organisational Theory (Avgerou and Conford, 1998), Unified Theory of Acceptance use of Technology (Venkatesh *et al.*,2003), Task and Technology Fit Theory (Goodhue and Thompson,1995),Socio-Technical Theory (Bostrom and Heinen,1977), Theory of Reasoned Action (Ajzen and Fishbein,1980), Theory of Planned Behaviour (Ajzen, 1985) and Decomposed Theory of Planned Behaviour (Taylor and Todd, 1995).

#### 2.2 The Technology Acceptance Model (TAM).

The Technology Acceptance model (TAM) is an information systems theory that explains how users come to accept and use technology in organisations as indicated in figure 2.1. The Technology Acceptance Model explains new innovation, acceptance of the innovation and the diagnosis of problems in advance before the users employ the own experiences. This model suggests that when a user is presented with new technology, a number of factors influence their decision regarding how and when they will use the innovation. For example, on one hand, perceived usefulness (PU) is defined by Davis (1989) as the degree to which the user believes that using a particular system would enhance his or her job performance. On the other hand, perceived ease of use (PEOU) is also defined by Davis (1989) as the degree to which a person believes that using a particular system would be free from effort (Davis, 1989).

**Figure 2.1 Technology Acceptance Model**



**Source:** Davis, Bagozi and Warsaw, (1989)

This theory is relevant to this study because it gives an overview of the benefits of ICTs adoption in SMEs. Further, the theory explains the factors (drivers) which influence the process of ICTs in business. These are the external variables. The theory also sheds light on the challenges and benefits of adoption of ICTs in business. Thus, lack of acceptance by the user is a significant impediment in the process of SMEs adoption of ICTs.

One of the criticisms of TAM theory is that there is a poor relationship between different constructs identified in Technology Acceptance Model (TAM). For instance, the theoretical strength of intention, actual use, link and the behaviour will not be considered as a terminal goal. Rather, behaviour should be considered as a more fundamental goal in ICTs adoption in business (Bagozi, 2007). Bagozi has further argued that TAM will be a deterministic model in the sense that while an individual's act would be assumed to be totally determined by his intention to act, the individual intentions could be subjected to evaluation and reflection, which might affect the person and make him reformulate his intention and even to take a different course of action. Hence, the TAM model is not suitable for explaining and predicting the new technology use in business (Gilbert, Balestrini and Littleboy, 2004).

Further, Technology Acceptance Model is criticised because it does not provide how user acceptance could be increased in a given situation.

### **2.3 The Organisational Theory (TOT)**

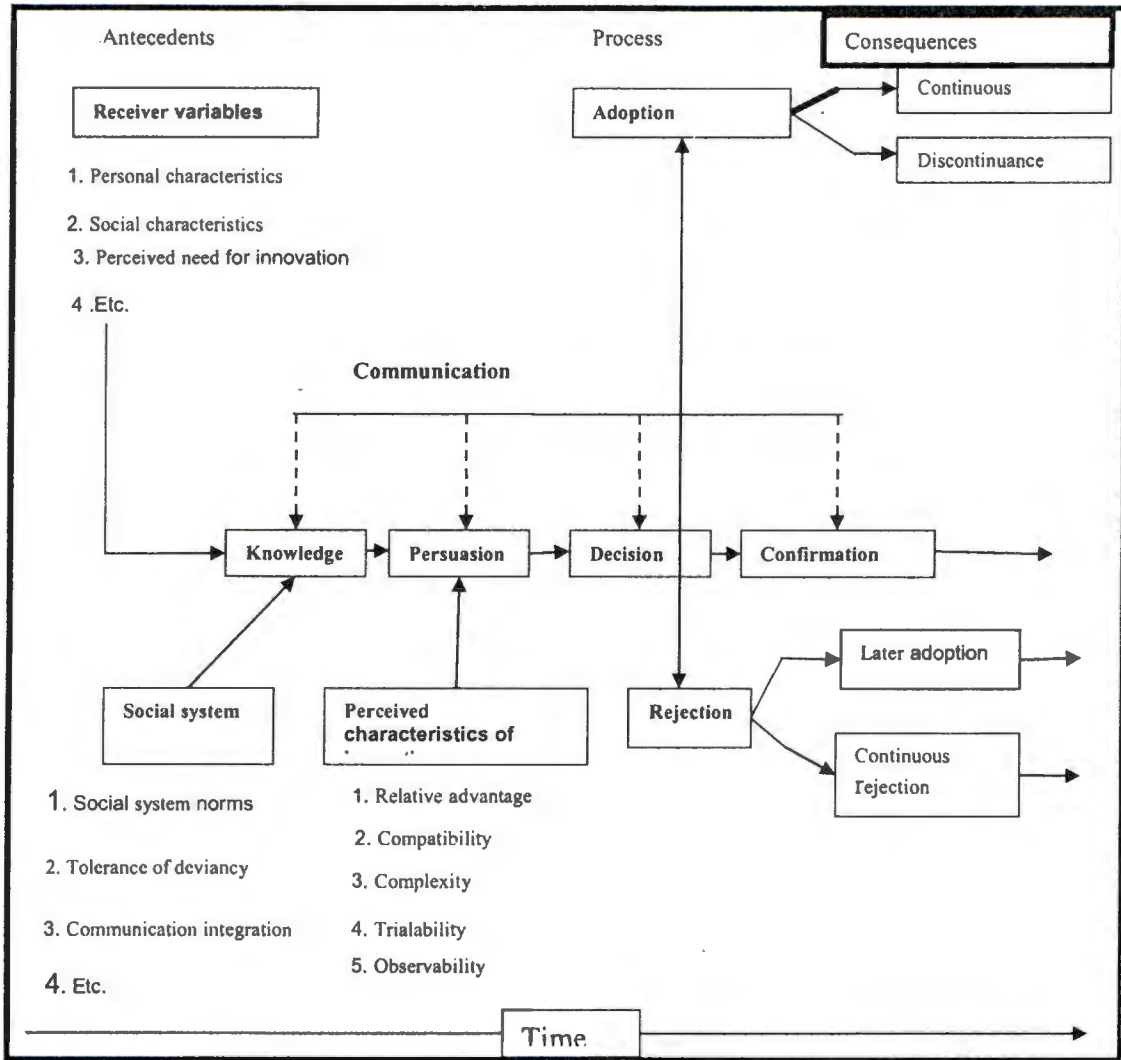
The organisational theory is designed to understand the nature of the organisations. Organisations would evaluate their overall performance by putting in place the right structures. The theory helps one to understand the management of processes such as change and decision making in organisations. Further, the theory states that the success of any innovation systems in an organisation depends largely on the effectiveness of management within an organisation (Avgerou and Conford, 1998). The theory explains that any change which takes place in an organisation must be supported by the Management. Therefore, the process of ICTs adoption in SMEs needs management support because management provides the necessary resources to ensure that change is successfully implemented in the organisation.

One criticism of the organisation theory is that it ignores the relationship between the organisation and its environment. However, the relationship is critical in understanding the external variables which affect the organisation in implementing any organisational change. Further, the theory ignores the differences in managers' and workers' views which are very critical in understanding how they implement any changes which take place in an organisation.

### **2.4 The Diffusion of Innovation Theory (DOI).**

This theory sheds light on how the ICTs inception idea is transformed to be viable and benefit the businesses processes if and when accepted by the end users. The relationship within the theory is indicated in figure 2.2.

**Figure 2.2 Diffusion of Innovation Theory**



**Source:** Rogers (1995)

The theory has its potential application to Information Communication Technologies (ICTs) adoption in business and it has been applied in a number of related studies (Lausen,1997 ; Ibbotson, 2000; Minish-Majanja and Kiplang'at, 2005). The theory is a social process where an idea is perceived and communicated through perceived channels (Rogers, 1983). This theory is built on concepts which are crucial in understanding the process of ICTs adoption by SMEs.

In Rogers's theory, diffusion is defined as a process of communication by which an innovation in the form of ideas, practices or products, is spread through certain channels, over time among the members of a social system (Rogers and Scott, 1997). This definition highlights four elements of ICTs diffusion process which are crucial in understanding ICTs adoption by SMEs. These elements are innovation, communication channel, time and social system.

Innovation refers to the elements which determine the rate of organisational changes. These elements are: 1) relative advantage, 2) compatibility, 3) complexity, 4) trialability and 5) observability to those people within the social system. Relative advantage refers to the degree to which an innovation is perceived as better. The degree of relative advantage can be measured in economic terms. What matters is whether an individual perceives innovation as advantageous to the organization or not. The more individuals perceive the relative advantage of an innovation, the more chances of adoption in their business processes. Similarly, when the users perceive that the innovations are not advantageous to the organisation, the chances of adopting the innovations become limited.

Compatibility refers to the degree to which an innovation is perceived as being consistent with existing values, past experiences, and needs of potential adopters. An idea which is incompatible with the values and norms of a social system will not be adopted as rapidly as innovation that is compatible. Complexity refers to the degree to which an innovation is perceived as difficult to understand and difficult to use. Some innovations which are understood by members of a social system will be adopted very fast while innovations which are not understood by the members of a social system will be adopted slowly because the innovation may require a lot of training of the members of the system. Thus, the new technology will be easily adopted as an innovation if it is understood by the existing employees.

Trialability refers to the degree to which an innovation may be experimented with on a limited basis. New ideas that can be tried on the instalment basis will generally be adapted more quickly than innovations which are not divisible and this may lead to resistance to adoption. Observability refers to the degree to which results of innovation are visible to others. Thus, when individuals see the results of an innovation, they are more likely to adopt it.

Communication channels refer to the means by which messages about innovation are transmitted among members of a social system (Rogers, 1995). Communication is the process by which participants create and share information with one another to reach a mutual understanding. A channel is the means by which messages are conveyed from one individual to another in an organisation. Mass media channels are more effective in creating knowledge of innovations whereas interpersonal channels are more effective in forming and changing attitudes toward a new idea, and influencing the decision on whether to adopt or reject a new idea.

Time of Diffusion focuses on three dimensions which are critical in the decision making process of ICTs adoption. First, decision making process dimension involves the introduction of the new idea and the decision to accept or reject the idea. An individual seeks information at various stages in the innovation-decision making process in order to decrease uncertainty about the adoption of the idea to the organisation. However, there are five stages involved in the process of ICTs adoption. These are: i) Knowledge where a person becomes aware of an innovation and has some idea of how it functions, ii) persuasion, a person forms positive or negative attitudes towards the innovation, iii) decision when a person engages in activities leading to a choice to adopt or reject the innovation, iv) implementation when a person puts an innovation into use and finally, v) confirmation where person evaluates the results of an innovation decision already made to be adopted by the business.

Second, individual innovativeness dimension refers to the degree to and rate at which individuals in a social system catch on to a new idea. Third, the rate of dimension of time refers to the relative speed at which a new idea is adopted and measured in terms of the number of members that adopt the new idea at a given time (Rogers and Scott, 1997).

A social system is defined as a set of interrelated units such as individuals groups, organisations, and subsystems that are engaged in joint problem-solving to accomplish a common goal (Rogers and Scott, 1997). Thus, members or units of a social system may be individuals, informal groups, organisations, and/or subsystems which are involved in the diffusion process.

Rogers's theory is relevant to this study because it focuses on the process of new technology adoption in any business enterprise. More importantly, all innovations must be transmitted through acceptable channels in organisations and analysed within a given time. Finally, the theory relates to the decision to be taken on whether to accept or reject the innovation by members of a social system.

A criticism of Diffusion Innovation Theory is that the theory fails to take into account the organisational factors which are critical in the process of Information Communication Technologies adoption. For instance, the theory does not consider management of the organisation as a major enabling factor in Information Communication Technologies adoption in business. Any change which takes place in an organisation must be supported by the management of the organisation. Furthermore, the theory does not also consider the availability of human resources in the organisation. The availability of human resource in organisation is very critical in the process of diffusion of new technology in business (Gilbert and Kelly, 2005).

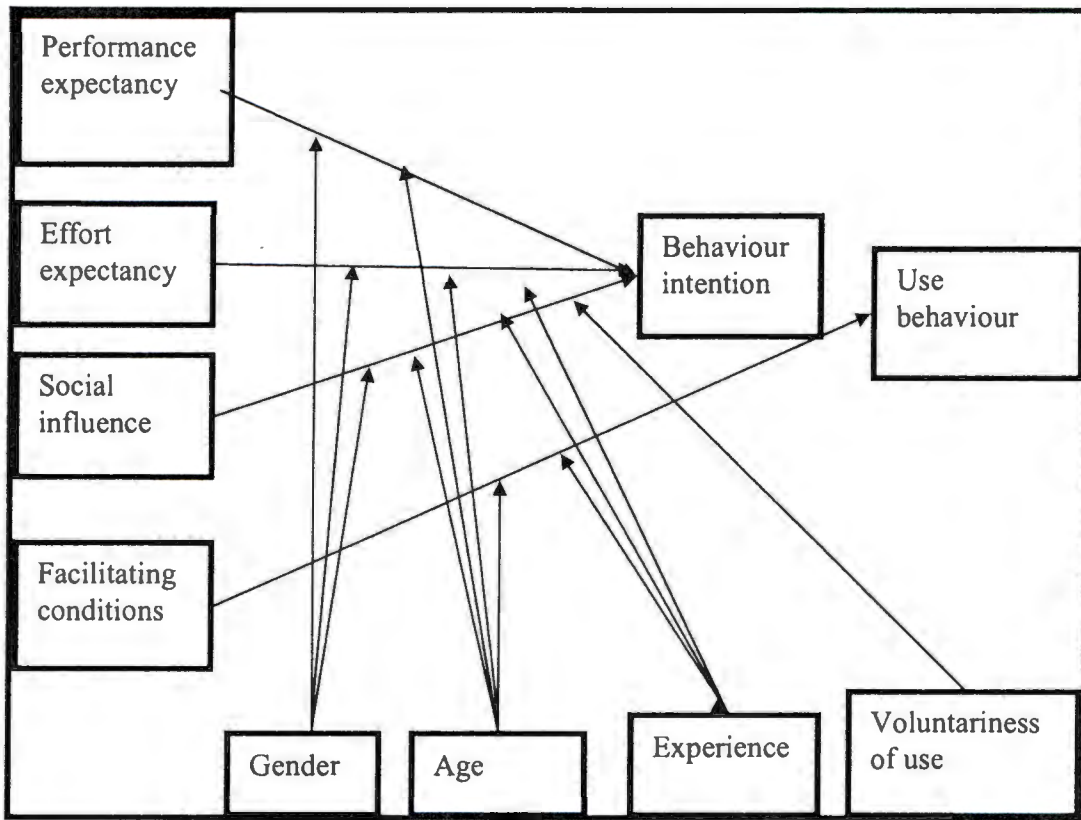
The next theory found to be useful in this study is the Unified Theory of Acceptance and Use of Technology.

## **2.5 Unified Theory of Acceptance and Use of Technology (UTAUT)**

The Unified Theory of Acceptance and Use of Technology (UTAUT theory explains how the user intends to use the technology or the information system and any subsequent usage behaviour. This theory is shown in Figure 2.3. The theory is based on four key constructs which are critical in making informed decisions on adoption of ICTs in businesses. These include constructs namely: performance expectancy, effort expectancy, social influence and facilitating conditions. The four constructs are the determinants of intention usage and behaviour of technology (Venkatesh, Morris, Davis and Davis, 2003). The issue of gender, age, experience and voluntariness of use mediate the impact of the key four constructs on the usage intention and behaviour. Thus, the theory emphasises the fact that the intention to use information technology will lead to ICTs adoption in any business.

The theory is relevant in this study because it highlights the reasons for ICTs adoption and the subsequent process of adoption by SMEs.

**Figure 2.3 Unified Theory of Acceptance and Use of Technology (UTUAT)**



**Source:** Venkatesh, Moris, Davis and Davis, (2003)

The theory of Task Technology Fit discussed in the subsequent paragraph highlights why SMEs adopt ICTs in their business.

### **2.6 Task Technology Fit (TTF) Theory**

Task Technology Fit (TTF) is defined as the degree to which technology assists an individual in performing his tasks (Goodhue, 1995). In addition, the technology adopted in business must be fit in terms of task requirements, individual abilities, functionality and the interface of the technology (Irick, 2008). In this theory technology refers to computer systems (such as hardware, software and data) while tasks refer to those actions or activities carried out by an individual in turning the inputs to outputs. Thus, for the technology to have a positive impact on the individual performance must be utilised and; it must be of good fit

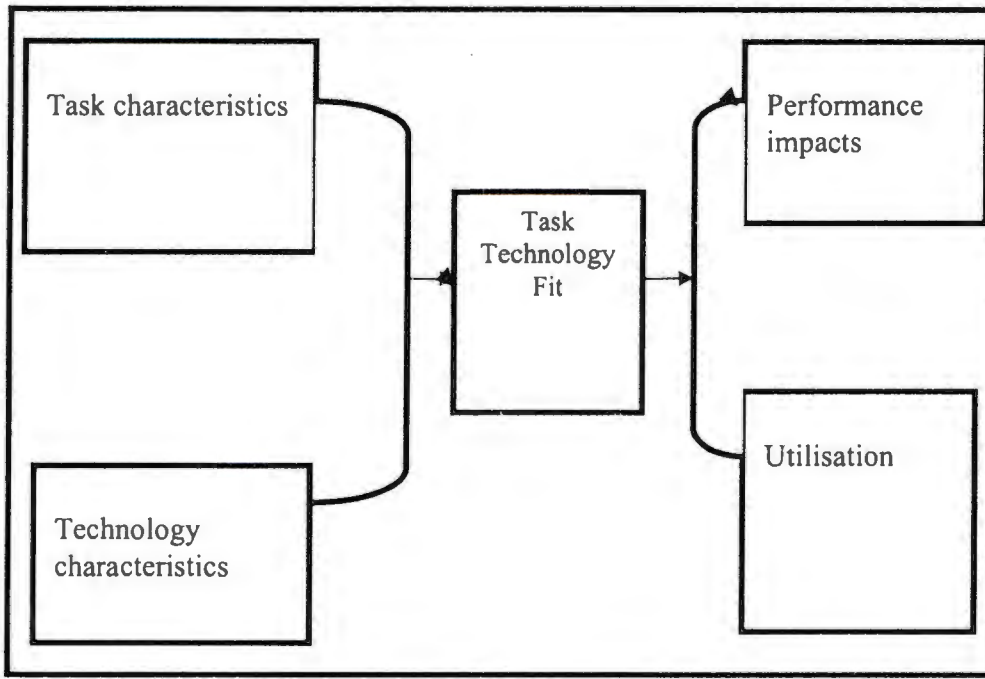
with the tasks the technology supports. Therefore, if the task of technology utilisation is lacking, the technology will not improve the performance. The Task Technology Fit (TTF) theory holds that Information Technology (IT) is more likely to have a positive impact on individual performance and could be used in the organisation if the capabilities of the IT match with the tasks that the user performs (Goodhue and Thompson, 1995) as illustrated in figure 2.4.

The TTF theory is based on main dependent constructs or factors which are critical in understanding the process of ICTs adoption by business. The relevant factors are the individual performance and system utilization. The main independent constructs are the Task and Technology characteristics which are also critical in making informed decision whether to adopt or not to adopt ICTs in the business. Goodhue and Thompson (1995) developed a measure of Task Technology Fit that consists of different factors namely: quality, locatability, authorisation, compatibility, ease of use/training, production timeliness, system reliability and relationship with users. Goodhue and Thompson (1995) argued that the TTF measure in conjunction with utilization is a significant predictor of ICTs adoption by business. Therefore, this theory emphasises that any technology adoption in any business process depends on the technology compatibility with business needs, performance impacts and utilisation in the business processes. Thus, this theory sheds light on factors which influence the process of Information Communication Technologies (ICTs) adoption by SMEs.

The criticisms of the theory include the fact that the Task Technology Fit theory assumes that the utilisation aspect of technology is always voluntary, However, but it ignores the fact that the utilisation of this technology is not always voluntary. For instance, a system may use the new technology because it is the only one available in the market and therefore, the user does

not have any choice but to use the available technology. In addition, the utilisation of the technology does not automatically lead to higher performance (Irick, 2008).

**Figure 2.4 Task Technology Fit Theory**



**Source:** Goodhue and Thompson, (1995)

Another theory considered in this study is the Socio-Technical Theory which discusses the elements of organisation which are critical in the process of implementing change successfully in organisation as expounded below.

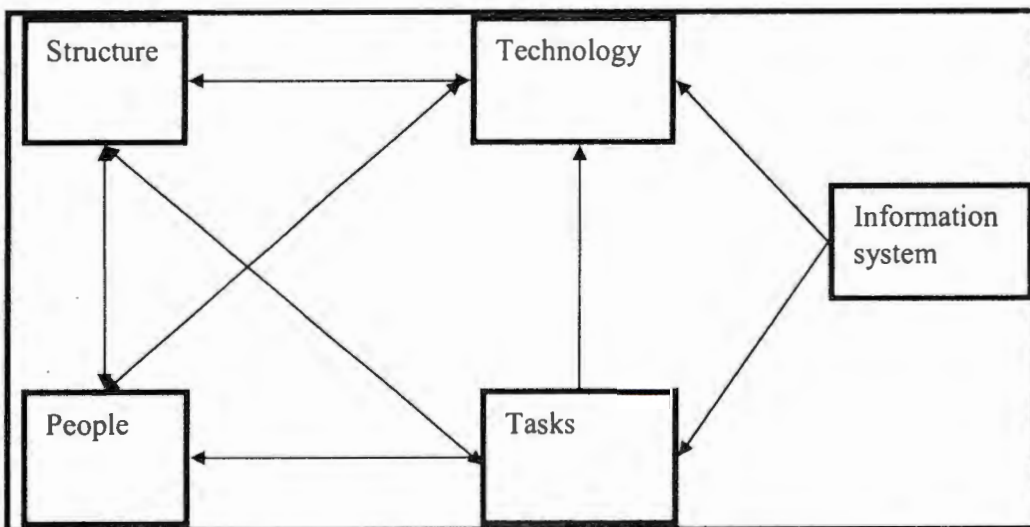
### **2.7 Socio-Technical Theory**

The socio-technical theory has its origins in the work of Eric Trist and others in the Tavistock Institute in London during the 1950s and 1960s. The theory states that systems consist of socio-technical systems (illustrated in figure 2.5) and any change which takes place in an organisation needs the configuration of both the socio and technical systems of the business. The technical system consists of the devices, tools and techniques needed to transform inputs to outputs in a way which enhances the economic performance of the

organisation. The socio-system consists of the employees of the organisations at all levels of management. The socio-system is critical in understanding ICTs adoption by SMEs.

There are however, external forces which influence the organisation's adoption of ICTs in the business. These are called environment sub-systems which include the customers, suppliers, rules and regulations. In addition, they are both formal and informal sub-systems which govern the way an organisation operates at large. The social and technical subsystem of the organisation is interrelated and interdependent. Any change which takes place in an organisation compels the two systems to work together to make the change successful. The theory posits that there are challenges which SMEs owners/ managers would face in the process of ICTs adoption in their business and therefore, the need for necessary interventions to be put in place to enhance the degree of ICTs adoption by SMEs.

**Figure 2.5 Socio –Technical theory**



Source: Bostrom and Heinen, (1977)

The Theory of Reasoned Action discussed below gives an insight into the process of ICTs adoption in SMEs. Further, the theory sheds light on the factors to be considered in the process of ICTs adoption in SMEs.

## **2.8 Theory of Reasoned Action (TRA)**

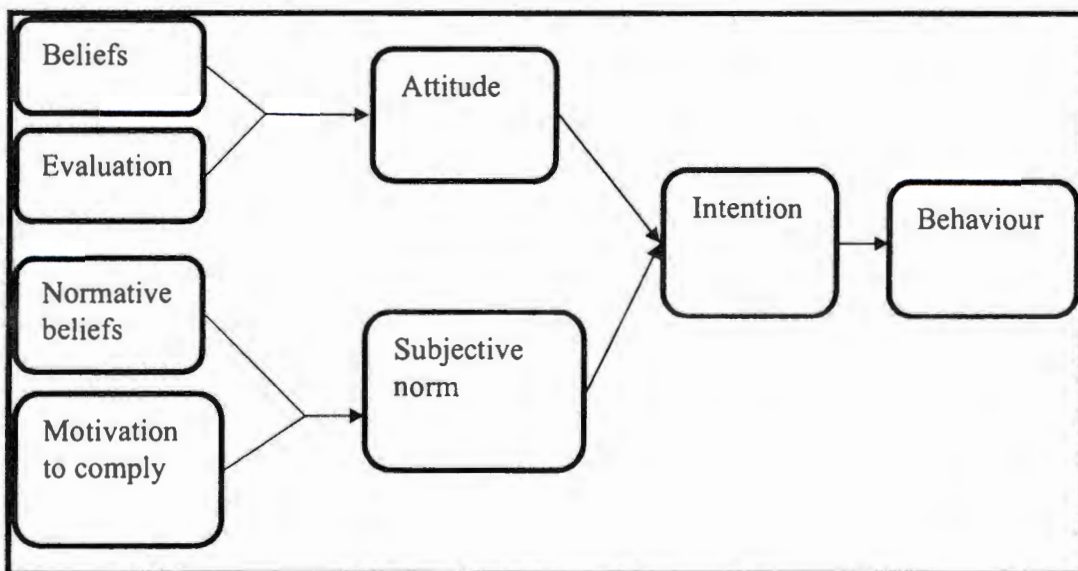
Theory of reasoned action was developed by Martin Fishbein and Icek Ajzen as an improvement over the Information Integration theory (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975). The theory assumes that individuals are rational in considering the implications of their decisions (decision making process). As shown in figure 2.6, the theory indicates how an individual's behaviour (e.g. use or rejection of technology) influence the usage of the new technology in business. Intention to use or adopt ICTs presents a person's readiness to accept the technology and is determined by three factors which include the attitude towards specific behaviour, subjective norms and perceived behaviour control. An attitude refers to an individual perception (either favourable or unfavourable) toward specific behaviour (Werner, 2004). Subjective norm refers to the individual of subjective judgement regarding others preference and support for behaviour (Werner, 2004).

Furthermore, factors which influence the new technology adoption in any organisation are the intention to perform behaviour which is influenced by attitude towards the behaviour. This compels one to make a rational decision either to adopt or not to adopt the new technology in organisation. Barnes and Hinton (2012) argue that individual behaviour is driven by intention. Behaviour intention is seen as independent on individual attitude toward the behaviour and subjective norm is associated with the behaviour. Attitude is determined by individual belief about the outcomes of undertaking certain behaviour. Subjective norms arise from the influence of the people in an individual's social environment.

The theory shows that making rational decision to adopt or not to adopt ICTs in an organisation is influenced by many factors. The concept of behaviour intention indicates how much effort an individual would like to commit to influence the behaviour to adopt ICTs in business. High commitment is more likely to mean that behaviour would be performed.

A criticism of the Theory of Reasoned Action is that the theory does not consider the demographics and personality variables which are very critical in understanding the process of ICTs adoption in business. In addition, the theory does not give a proper definition of perceived control. It is also hard to measure the perceived behaviour of an individual. Further, the theory assumes that people are rational and always make systematic decisions based on the available information but the theory ignores the unconscious motives of making these decisions. The theory fails too to specify the conditions under which attitude and subjective norms would or would not have distinct influence on the intentions. It also does not account for the social factors that in real life could be a critical factor in determining the individual behaviour (Grandson, Peter and Mykytyn, 2004). Finally, the intention behaviour gap is not always translated into behaviour and not all attitudes make into intention.

**Figure 2.6 Theory of Reasoned Action (TRA)**



**Source:** Ajzen (1991)

The Theory of Planned Behaviour is also one of the useful theories which give an overview on the ICTs adoption in SMEs. Specifically, the theory informs one to understand the factors that influence SMEs adopt ICTs in their business. The Theory of Planned Behaviour

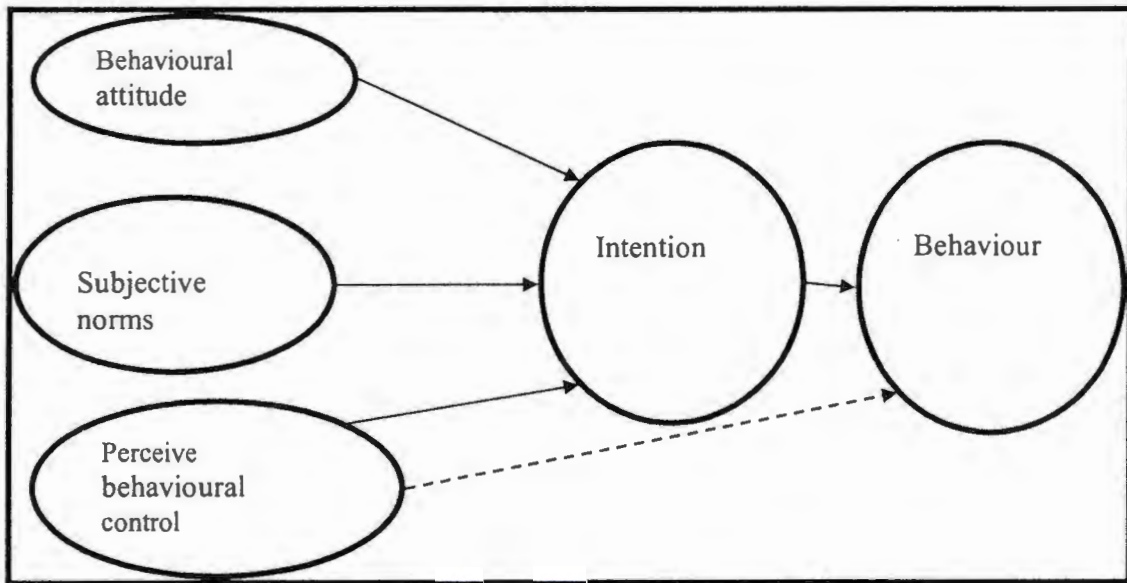
discussed below is also important in this study because it highlights the drivers that influence the process of ICTs adoption by SMEs.

## **2.9 Theory of Planned Behaviour (TPB)**

The theory of planned behaviour (TPB) is widely used in examining the user acceptance of the new technology adopted in the organisation (shown in figure 2.7). TPB (Ajzen, 1985, 1991) is a descendant of TRA and adds a third variable of intention of perceived control. The perceived behaviour control refers to people perceptions of their ability to perform a given behaviour and its influence on the intention. This perceived behaviour control is determined by the availability of the skills, resources and opportunities to achieve the outcomes. TPB model holds that attitudes, subjective norms and perceived behaviour control are direct determinants of intentions to use or adopt ICTs in the business. Furthermore, TPB posits that individual behaviour is driven by behavioural intentions to use or adopt ICTs in their business.

The theory is relevant in this study because it gives an insight on the drivers of ICTs adoption in SMEs. For instance, the availability of skills and resources are considered critical elements in ICTs adoption in SMEs. Furthermore, this theory sheds light on the key variables which enable the process of ICTs adoption in SMEs.

**Figure 2.7 Theory of Planned Behaviour**



**Source:** Fishbein and Ajzen, (1975)

A criticism of the Theory of Planned Behaviour is that it overlooks emotional variables such as threat, fear, mood and negative or positive feelings which would influence the intention.

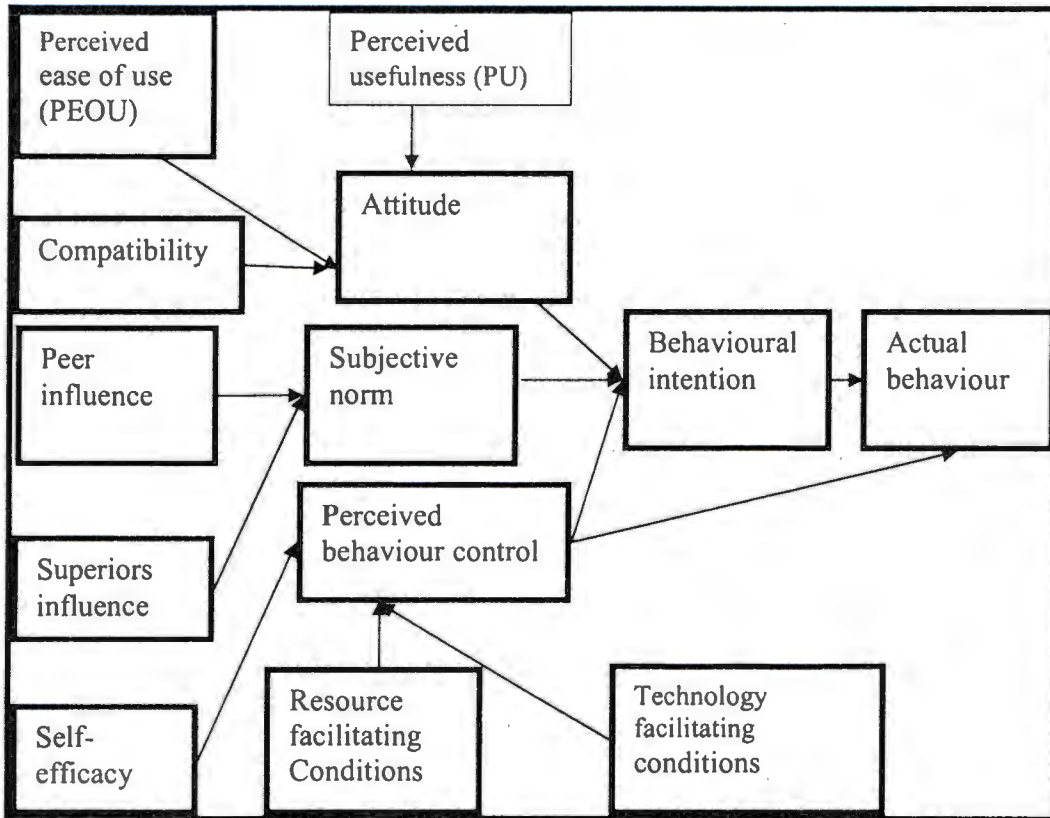
The Decomposed Theory of planned Behaviour as discussed in the subsequent paragraph is important in this study because it specifically highlights the benefits of ICTs adoption by SMEs.

### **2.10 Decomposed Theory of Planned Behaviour (DTPB)**

The theory identifies specific antecedents which are critical in the process of ICTs adoption in an organisation as shown in figure 2.8. These antecedents are attitude, subjective norms and perceived behavioural control which are all considered as relevant to information technology use or adoption in an organisation (Taylor & Todd, 1995). Furthermore, Taylor & Todd (1995) suggested that perceived usefulness, perceived ease to use and compatibility of

the antecedents of the attitude are factors which influence the process of ICTs adoption by the organisation. People would adopt technology in their organisation if they perceived its usefulness and ease to use in their organisation. In addition, Taylor & Todd suggested that peer pressure and superiors influence are antecedents of subjective norms. Finally, the model emphasises that self-efficacy, resource facilitating and technology facilitating conditions are determinants of perceived behavioural control in adopting ICTs in business. The theory sheds light on the benefits and factors which influence the process of ICTs adoption by SMEs. SMEs will adopt ICTs in their business processes when the benefits derived are more than the disadvantages. The perceived behaviour control is decomposed of three constructs namely self-efficacy, resource facilitating conditions and technology facilitating conditions. These constructs act as barriers to ICTs adoption in business. Thus, the perceived ease of use, perceived usefulness and compatibility of ICTs are critical factors in determining the usage of ICTs in business.

**Figure 2.8 Decomposed Theory of Planned Behaviour (DTPB)**



Source: Taylor & Todd (1995)

The theory is relevant in this study because it sheds light on the critical factors one should consider in the process of ICTs adoption in business. In the process of ICTs adoption in business, there will be some barriers in the adoption from peer pressure and non-compatibility of ICTs. However, SMEs owners/managers must be aware of these salient influences and develop appropriate interventions to enhance the degree of ICTs adoption. In a nutshell, the theory gives an overview of the factors (drivers) and barriers to ICTs adoption in business.

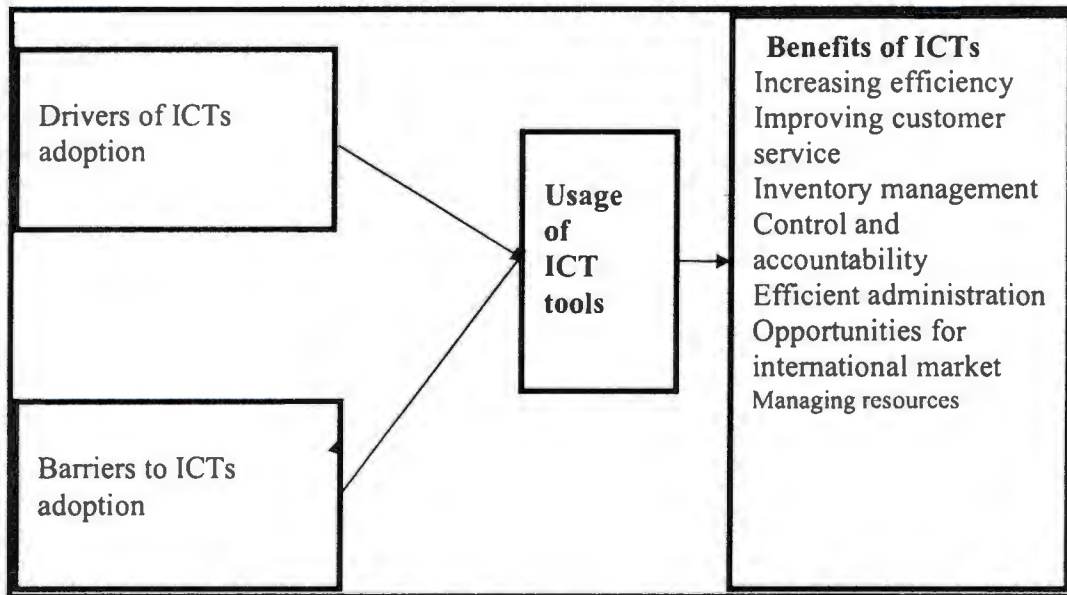
## **2.11 Conceptual Framework Model**

The conceptual framework model for this study is highlighted in figure 2.9. The model framework has been developed from the theories discussed. The model has four key elements which are critical in understanding the process of Information Communication Technologies (ICTs) adoption by SMEs. The four elements are: drivers (Influencers) that drive the adoption of ICTs, restraining forces (barriers) to ICTs adoption, ICT tools and benefits of ICTs adoption.

The driving forces (influencers) are factors which compel SMEs to adopt ICTs in their business processes and these include the change in technology, globalisation, competition, market advantages and personal consideration of SME owner/managers. However, despite the driving forces, SMEs have failed to adopt ICTs in their business because of restraining forces (barriers). These restraining forces (barriers) inhibit the process of ICTs adoption by SMEs and include unfamiliarity with software application, lack of infrastructure, lack of human resource and skills, lack of information system knowledge, high cost of internet connectivity, lack of security and reliability.

ICT tools adopted by SMEs in the business processes include but are not limited to mobile phones, personal computer, laptops, scanners, fax machines and photocopier machines. Thus, ICTs adoption leads to improvement of customer service, flow of information, inventory management, control and accountability, opportunities for international markets, managing resources effectively and efficient administration. Furthermore, businesses will reap more benefits of ICTs adoption if strategies suggested to lessen the barriers to ICTs adoption by SMEs are implemented. Provision of infrastructural facilities, information sharing, human capital development and collaborative use of ICTs are also necessary.

**Figure 2.9 Conceptual Framework Model**



Source: Ongori, (2009)

## 2.12 Summary

The chapter has given an overview of the theoretical and conceptual framework of the study. The theories which have informed this study include: Technology Acceptance Model (TAM); The Organisation theory; the Diffusion of Innovation Theory (DOI); Unified Theory of Acceptance and Use of Technology (UTUAT); Task Technology Fit (TTF) Theory; Social Technical Theory; Theory of Reasoned Action (TRA) ; Theory of Planned Behaviour (TPB) and Decomposed Theory of Planned Behaviour (DTPB). Each theory has highlighted critical variables which are important in understanding the process of ICTs adoption in business.

Chapter 3 presents the review of relevant literature informed by the research objectives and corresponding question that emerge.

## CHAPTER 3

### LITERATURE REVIEW

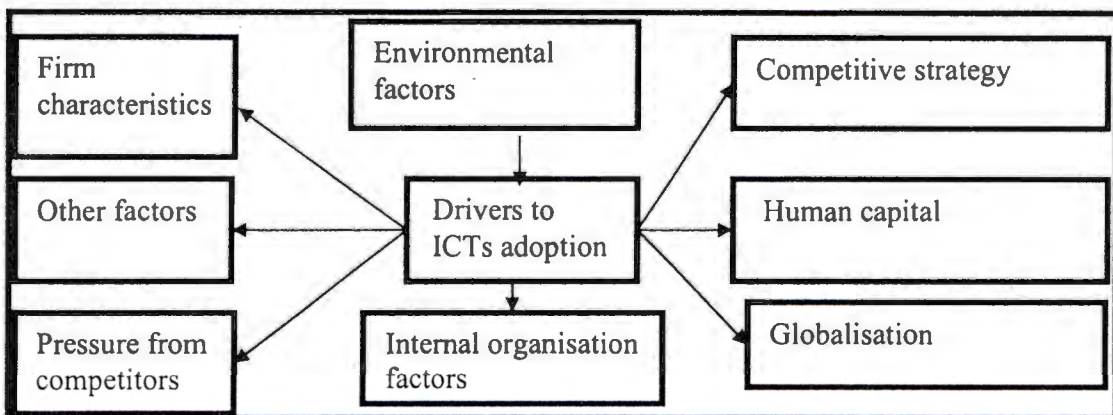
#### 3.1 Introduction

The literature review is based on the research objectives and corresponding questions. The areas of focus include: the drivers that influence the use of ICTs by SMEs; ICT tools; benefits of ICTs adoption in SMEs and barriers to ICTs adoption by SMEs. Also, the strategies to resolve barriers to ICTs adoption and role of government support to SMEs are reviewed.

#### 3.2 Drivers of ICTs Adoption by SMEs

ICTs adoption by SMEs is influenced by many factors which compel SMEs to adopt ICTs for survival and growth, sustainability and competitiveness. However, there are many drivers that influence the process of ICTs adoption in SMEs. These constitute the following; environment, human capital, firm structural characteristics, globalisation, pressure from competitors, competitive strategy and internal organisation as indicated in figure 3.1.

**Figure 3.1 Drivers of ICTs adoption in SMEs**



Source: Ongori, (2009)

### 3.2.1 External Drivers of ICTs Adoption by SMEs

External drivers have greatly influenced the process of ICTs adoption in SMEs. These drivers include globalisation, pressure from customers and suppliers and pressure from the competitors.

An important overarching driver to ICTs adoption by SMEs is globalization. The impact of globalization has compelled SMEs to adopt ICTs so that they can survive and compete with large companies. The business environment is not static and geographical distances are of no importance for customer-supplier relationships (Sharma and Bhagwat, 2006:200). Scholarly evidence tends to show that durable productivity gains have been achieved in enterprises which use Information and Communication Technologies (Bresnahan, Brynjolfsson and Hitt, 2002). This is due to the faster growing rate of globalization which has encouraged, among other things, the effective flow of data in organizations, which would only be facilitated by the use of ICTs. Sharma and Bhagwat (2006) suggest that the flow of information in and outside an organisation is the backbone of any business operational unit irrespective of its size. Thus, with the waves of globalisation, ICT is considered as the most cost efficient tool to help SMEs to gain bigger markets and the ability to compete with larger organisations more especially in attracting customers to their products, services and information (Tan, Chong, Lin and Eze, 2010).

The environmental pressure under which the business operates influences the process of ICTs adoption by SMEs. The pressure from customers and suppliers has greatly influenced the process of ICTs adoption by demanding to be served faster and quicker (Hashim 2007; Scupola, 2006; Kaynak *et al.*, 2005). Vrazalic *et al.*, (2002) argued that SMEs have been compelled to adopt ICTs in their business process because of pressure from competitors, suppliers and to improve customer services. In addition, Nguyen (2009) posits that SMEs

have been influenced to adopt ICTs in their business process by pressure from the external environment.

SMEs have adopted ICTs in their business process because of pressure from the competitors. SMEs businesses operate in a very dynamic environment where there are a lot of technological changes and competition. Therefore, SMEs have to adopt ICTs in their business process in order to respond fast to the competitors (Kannabiran and Dharmalingam, 2012; Pavic *et al.*, 2007; Kaynak *et al.*, 2005). Furthermore, SMEs face pressure to adopt ICTs in their business when they see more competitors in the industry adopt ICTs in their business. Indeed, pressure and expectations of the market trends in the business environment can force SMEs to adopt ICTs in their business as a strategy of survival (Narula and Arora, 2010).

### **3.2.2 Internal Drivers of ICTs Adoption by SMEs**

Internal drivers have influenced the process of ICTs adoption in SMEs. The internal drivers which have influenced the process of ICTs adoption by SMEs include competitive strategy, human capital, firm characteristics, internal organisation and other factors.

The evolution of technology has also affected the way businesses operate. First, it has changed the industry structures and altered the degree of competition. Second, it has created a competitive advantage for the businesses which have adopted ICTs in their business processes to compete and reap benefits of ICTs adoption. Third, it has affected business operations which have compelled SMEs to adopt ICTs in their business processes to cope with these changes in the business environment (Enderwick, 2002). ICTs adoption in SMEs provides means to accessibility, processing and distribution of greater amounts of data and information quickly in order to make thoughtful decisions (Jimmy and LI, 2003).

Also, there is need for SMEs to embrace state-of-the-art technologies in order to penetrate the international markets and remain competitive despite the challenges posed by globalization, liberalisation and technological changes (Sharma and Bhagwat, 2006:200; Dangayach and Deshmukh, 2000:256). This situation has forced SMEs to adopt ICTs in their business processes in order to counter the competition posed by large and multinational companies (Ramdani, Kawalek and Lorenzo, 2009:15). Windrem and De Berranger (2002) argue that business action strategy, which is driven by the top management and information intensity of the business, facilitates the process of ICTs adoption in SMEs.

As the number of SMEs increases, competition also increases. This leads to a decrease in prices, customer base, or both, resulting in the erosion of existing profits of SMEs. Further, competition tends to lead to unnecessary competition in which case the SMEs tend to lower prices, increase promotion of their products, improve their products, add new distribution channels and improve internal processes by adopting ICTs in their business processes (UNDP, 2007). For example, a foreign firm which is engaged in both the import and export market tends to succumb to competitive pressure working on product improvement, processes, promotion and domestic distribution channels. ICTs are said to play an important role in SMEs. The ICTs create business opportunities and reduce costs by improving internal processes and products through faster communication with customers through promoting and distributing products using online network systems.

The availability of human capital within and outside the organisation is crucial in facilitating the process of ICTs adoption in SMEs. The absence of human capital affects the use of technology in SMEs. Educated human capital with the required ICTs skills tends to act faster and is more receptive to new ideas and techniques especially in ICTs adoption (Pavic *et al.*, 2007; Narula and Arora, 2010). This has therefore encouraged SMEs owners/ managers to purchase and implement new systems which enable SMEs to cope with new ideas, concepts

and technologies. The workforce age also contributes to ICTs adoption in SMEs because the youth are flexible in implementing new ideas, concepts and technologies compared to the old people who may be resistant and have customised their work practices. Similarly, a better educated employee tends to create the flexibility needed to switch production, innovation, retraining and hence making relocation easier (Roffe, 2007; Mohamad and Ismail, 2009). Furthermore, availability of expertise in Information Communication and Technologies has been identified as a driver to ICTs adoption in SMEs (Narula and Arora, 2010; Eei, Husain and Mustaffa, 2012; Bordonaba-Juste, Lucia-Palacios and Polo-Redondo, 2012).

SMEs have unique characteristics such as limited resources and firm dependency on few key personnel. This creates a big challenge to the development and implementation of Information Technology. Those SMEs which have adequate financial resources are more likely to adopt ICTs in their business process because they are in a position to meet huge expenses involved in ICTs adoption (Moriones and Lopez, 2007; Mohamad and Ismail, 2009; Kannabiran and Dharmalingam, 2012). Also, SMEs owners/managers who have a positive attitude towards innovation and are knowledgeable about Information Technology (IT) are likely to adopt ICTs in their business process (Narula and Arora, 2012; Bordonaba –Juste *et al.*, 2012; Alam, 2011). Similarly, owners/managers who are in a position to recognise opportunities and threats in their environment especially in their chosen target market are able to develop appropriate strategies to retain and increase their market share by the adoption of ICTs in their business. In addition, a large volume of information intensity tends to compel SMEs owners/ managers to adopt ICTs in their business to assist in management and operational control of information (Hashim, 2007).

In the era of competition, SMEs are compelled to serve their customers better, develop ways to integrate suppliers and change their operational process. Therefore, to monitor the quality aspects of their products, there is need for ICT tools. In some SMEs, where quality control is

taken seriously at each stage of the production process, ICTs tools adoptions are critical to ensure quality output. Similarly, the issues of International Standards Organisation (ISO 9001) have also compelled SMEs to adopt ICTs in their business to ensure quality products. In addition, firms which have quality products offerings have a positive impact on ICTs adoption in their business process (Hughes, Golden and Powell, 2003). Decentralisation of SMEs activities compels SMEs to adopt ICTs in their business to facilitate the process of communication in the organisation (Moriones and Lopez, 2007; Nguyen, 2009).

There also exists other factors that would act as drivers to ICTs adoption by SMEs. Researchers have found that the driving forces for ICTs adoption by SMEs include organisation's ICTs readiness, customer/supplier dependency, structural sophistication of the business, need to improve customer services and increase in sales (Van Akkeren and Harker, 2003: 208; Vrazalic, Bunker, Macgregor, Carlson and Magnusson, 2002).

### **3.3 ICT Tools**

There are a variety of ICT tools used by business enterprises which include mobile phones, Microsoft office applications, computers, internet, e-mail, telephones, fax machines; photocopiers, printers, and websites (Raymond, Bergeron, and Blili, 2005:108; Mutula and Brakel, 2006:409; Mbogo,2010). Apulu and Lathan (2011) argue that SMEs use various Information Communication Technologies such as desktop computers, laptops, handheld devices, wired or wireless intranet, business productivity software such as editor and spread sheet, enterprise software, data storage and security, network and so on. Some of the ICT tools used by SMEs are shown in figure 3.2.

Phones are an extremely important ICT tool. Mobile phones are the most commonly ICT tool used by SMEs. Mobile phones are used by SMEs owners/managers for maintaining good customer relationships especially in keeping in touch with their customers. Esselaar *et al.*,

(2007) pointed out that usage of mobile phones had an impact on profitability and in maintaining customer relationship of SMEs. Similarly, Chiware and Dick (2008) argued that mobile phones are the most commonly used ICTs tool by SMEs in developing countries. In addition, Frempong (2005) asserts that in Ghana, SMFs use mobile phones for banking, transferring money, paying creditors, internet access and market surveillance. In Kenya, mobile phones are also used by SMEs owners/managers for communication purposes with their customers, paying bills, depositing money, sending money to friends and relatives, withdrawing cash, transferring money, topping up air time and accessing internet (Mbogo,2010). Mobile phones are also used as cameras and also serve as gadgets for listening to music and news.

Another set of ICT tools are the personal computers. Personal computers are some of the ICT tools used by SMEs. Middleton and Byus, (2011), Tan *et al.*, (2010); Chiware and Dick, (2008); Mutula and Brakel (2006); Raymond *et al.*,(2005) and Apulu and Ige (2011) noted that personal computers are used by SMEs for basic word processing, keeping records of the customers, accounting, accessing internet, and for other business practices. For instance, in the United States of America 66 percent of SMEs have personal computers (Middleton and Byus, 2011). In Kosovo SMEs use personal computers for market researching and planning and for quality control (Birisha-Namani, 2009).

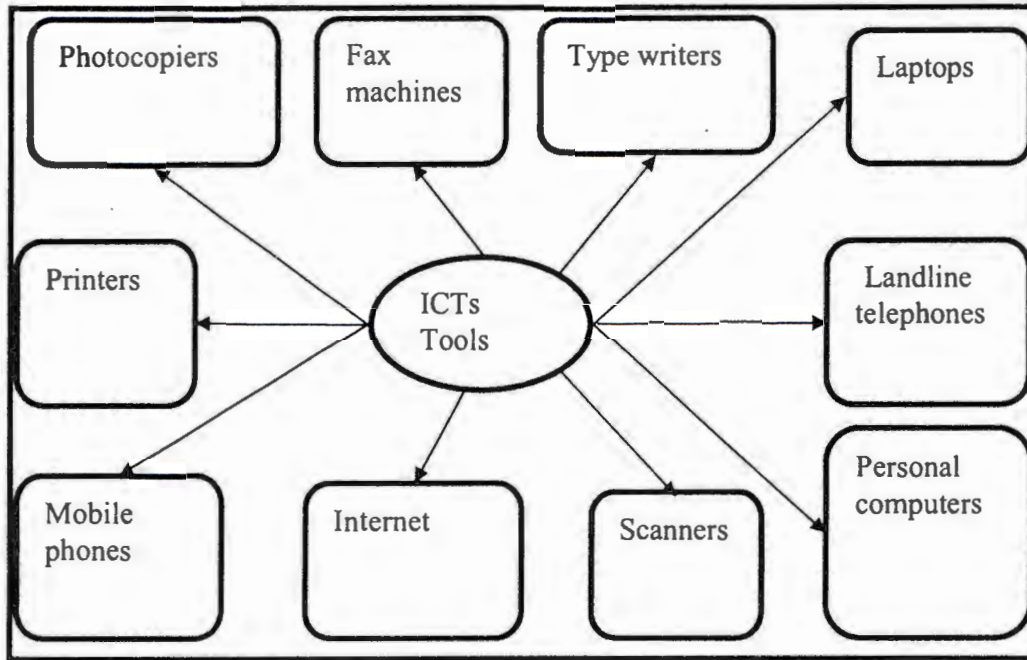
An important emerging ICT tool used by SMEs is the internet. Chiware and Dick (2008) argued that ICT tools especially the internet play a significant role in SMEs in accessing local and global market. Similarly, Kaynak *et al.*, (2005) and Bordonaba-Juste *et al.*, (2012) pointed out that the internet and fax tools are used by SMEs in accessing information, especially on the global market. Internet is used for emails and intranets, to exchange or share information either within the firm itself or with external stakeholders. Other benefits of using internet in their business include low cost of communication, easy access to

international markets, access to potential customers, enhancing the image of the firm, creating new business opportunities and cost reduction in advertising.

Some of the SMEs benefits in ICTs adoption include: improved and quick response to customers' needs, increased productivity and better monitoring of competitors. Kartiwi (2006) pointed out that ICTs adoption by SMEs especially in the use of internet will benefit SMEs in facilitating a quick flow of communication within and outside the business. It will also lead to better linking between buyers and sellers in local and global markets. SMEs also benefit from ICT adoption in terms of reduction of costs incurred in advertising and promotion of their products.

Furthermore, the usage of internet has led to the shortening of the supply chain management by minimising the transport obstacles and reducing delivery costs of the products and services. This makes ICTs adoption by SMEs to be critical in responding to their customers needs faster which would lead to greater customers' satisfaction. Further, ICTs adoption by SMEs leads to an improvement of internal processes of the business and enhances chances of faster communication with their customers. Thus, internet is one of the Information and Communication Technologies which is well-known and widely used by SMEs because of its ability to transmit and receive information at a fast rate with almost no geographical restriction (Berisha-Namani, 2009; Wanjau, Macharia, and Ayodo, 2012; Eei *et al.*, 2012; Bayo-Moriones, Billion, Lera-Lopez, 2013).

**Figure 3.2 ICT tools**

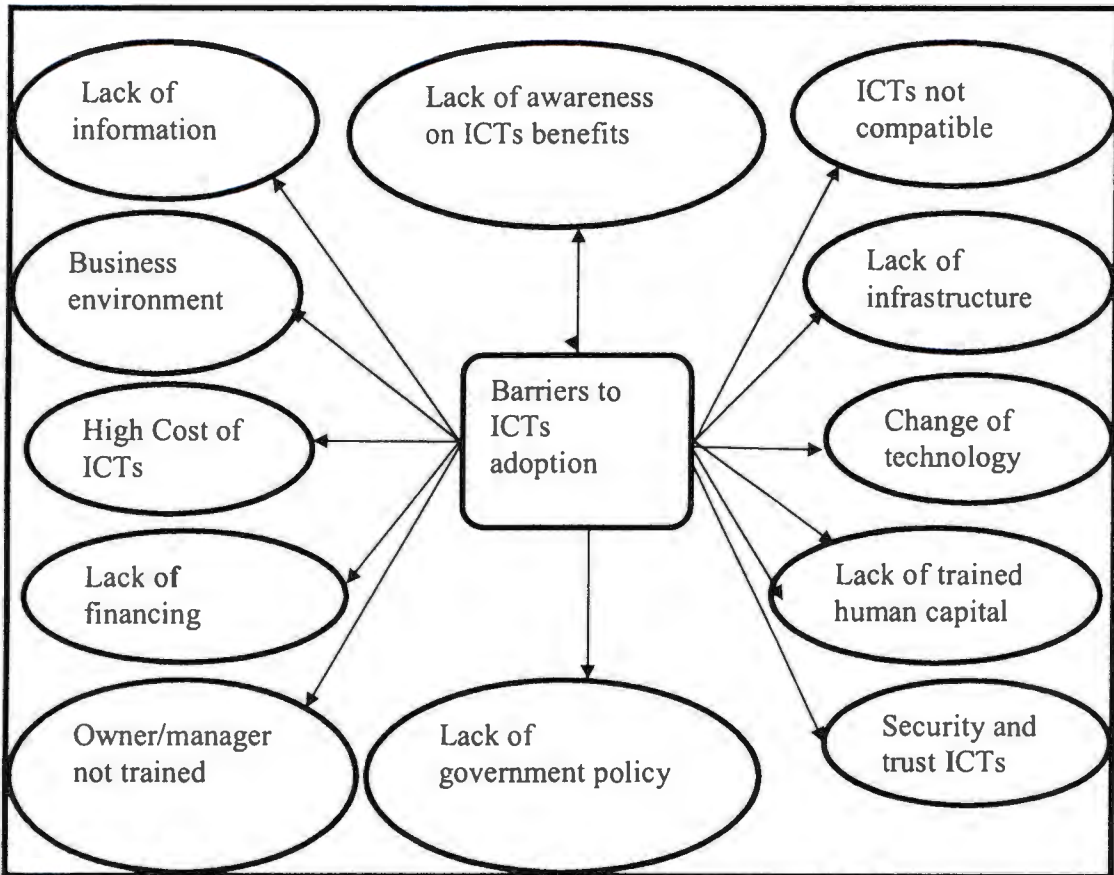


Source: Ongori, (2009)

### **3.4 Barriers to ICTs Adoption by SMEs**

In developing countries, there are barriers which limit Small and Medium Sized Enterprises (SMEs) to adopt ICTs in their business (Moodley 2001; Mutula 2004; Jain, 2002). Mutula and Brakel (2006) identified some of these barriers as the high cost of access to telecommunications, lack of government policy towards ICTs, use of obsolete technologies, underutilization of existing technologies, limited indigenous base and digital illiteracy, lack of skilled and trained manpower, poor communication infrastructure, ignorance of ICTs benefits, high cost of internet connectivity, cost of ICTs equipment and resistance to change. These barriers are shown in figure 3.3.

**Figure 3.3 Barriers to ICTs adoption by SMEs**



Source: Ongori, (2009)

### 3.4.1 External Barriers to ICTs Adoption in SMEs

External barriers to ICTs adoption have negatively affected the process of ICTs adoption by SMEs. These external barriers to ICTs adoption in SMEs include lack of information, changes in the external environment, incompatibility of ICTs, lack of infrastructure, lack of trained human capital, limited financing options, and an inhibiting government policy. In addition, the high cost of ICTs, change in technology, and security and trust challenges in using ICTs are some of the barriers to ICTs adoption in SMEs.

Kapurubandara (2009) argues that one of the strongest inhibiting factors for small firm information technology adoption is lack of information system knowledge. Most of the SMEs

employees do not have the necessary knowledge on information technologies. This makes it difficult for SMEs to adopt ICTs in their business. Similarly, Chiware and Dick, (2008) and OECD (2004) posit that the ignorance surrounding the benefits of adoption of new technology in SMEs has impeded the process of ICTs adoption. In addition, the concerns about security in using ICTs, lack of physical infrastructure, costs, legislation and interoperability of the ICT tools have further complicated the process of ICTs adoption in SMEs.

Lack of information about the perceived benefits of ICTs adoption in SMEs has made SMEs not to adopt ICTs in their business. This problem is further compounded by lack of appropriate ICTs skills to assist SMEs in the process of ICTs adoption. SMEs owners/managers may be willing to adopt ICTs in their business but since they lack manpower with appropriate ICTs related skills in their business, leads to failure to adopt ICTs (Galloway and Mochrie, 2005; Duan, Roisin, David, Stanishaw, Henry, Virgilio and Joao, 2002; Barbra-Sanchez, Marinez-Ruiz, Jimenez-Zarco, 2007; Ndiege, Herselman and Flowerday, 2012).

Vachara and Derek (2006) stated that ICTs adoption by SMEs theoretically fails to benefit SMEs due to barriers to ICTs adoption. This barrier includes the external business environment which undermines the organisation's decision making and adoption processes. The business environment is very dynamic and competitive and therefore, the external environmental factors such as technology keep on changing. This makes SMEs owners/managers not to make informed decisions with regard to adopting ICTs in their business. Also, most SMEs in developing countries tend to operate in a fragile environment which makes ICTs adoption difficult in SMEs (Bagchi and Udo, 2007; Kapurubandara, 2009).

ICTs tools are excessively expensive and not tailored to or even compatible with the needs of SMEs. This makes SMEs owners/managers not to adopt ICTs in their businesses because they are worried about the incompatibility of ICTs and the high rate at which software keeps on changing rendering some operating systems obsolete (Tan *et al.*, 2010). Most ICTs available are for large firms. Furthermore, most manufacturers make ICTs targeting large firms but they do not take into consideration the needs of SMEs. SMEs owners/managers fail to adopt ICTs in their business processes because they are not compatible to their needs. In addition, SMEs lack personnel with the relevant skills to assist in the process of ICTs adoption. Thus, SMEs are faced with many problems compared to larger firms especially in finding ICTs applicable to their businesses because of lack of time and skills of the existing employees.

Infrastructure is also essential in ICTs adoption by SMEs. However, poor basic infrastructure is a hindrance to ICTs adoption in Kenya's SMEs. The basic infrastructural requirements include electricity and educated workers in ICTs who are lacking in most developing countries. This makes the accessibility of internet to be expensive, and thus, the process of adoption becomes complex. Furthermore, poor communication infrastructure leads to limited access and higher costs of ICTs (Kapurubandara, 2009; Tan *et al.*, 2010; Wafula- Kwake and Ocholla, 2007; Galloway and Mochrie, 2005). For instance, Kari (2007) asserted that lack of infrastructure is a major barrier to ICTs adoption in developing countries. The availability of a wide range of internet connection and other services are critical in the process of ICTs adoption.

The availability of a range of internet connections allows SMEs owners/managers to choose different and appropriate services according to their specific needs and their expectations. Many SMEs are hesitant to adopt ICTs in their business process because of undeveloped infrastructure. Esselaar *et al.*, (2007) posits that SMEs have failed to adopt ICTs in their

business because of network problems and unreliable infrastructure. Chiware and Dick (2008) in research conducted on Namibian SMEs argued that lack of infrastructure has affected the process of ICTs adoption by SMEs. This has led to high costs of communication especially in areas where there is one telecommunication service provider.

Many SMEs have not adopted ICTs in their business because of poor communications infrastructure which leads to high costs. In addition, many developing countries use out-dated equipment which is state owned and in the long-run creates room for monopolies which tends to lead to high costs of communication. This makes the coverage to be limited and expensive to the end users and therefore, it discourages SMEs from adopting ICTs. Furthermore, Narula and Arora (2010) argue that lack of infrastructure has acted as a barrier to Information and Communication Technologies adoption in SMEs. Thus, lack of infrastructure refers to the SMEs perception about the availability of supporting services in the region/country to promote the adoption of SMEs. In addition, poor infrastructure, and lack of ICTs technical and managerial capacities among SMEs are considered as barriers in adopting ICTs in SMEs.

Human resources in form of a pool of ICTs related skills are critical in the process of ICTs adoption in SMEs. For instance, higher illiteracy rates tend to contribute negatively in ICTs adoption in SMEs because of their failure to attract qualified personnel to their businesses. The problem is compounded further by lack of availability of manpower in the labour market or failure to attract the right personnel to assist in the process of ICTs adoption in SMEs. Trained manpower in terms of information technology aids in ICTs adoption by SMEs. Further, lack of internal skills by SMEs has been cited by Harindranath, Dyerson and Barnes, (2008), Maguire *et al.*, (2007) and Duan *et al.*, (2002) as a barrier to ICTs adoption by SMEs.

The trained human capital in the economy that has skills and knowledge in information systems acts as a strong foundation for ICTs adoption by SMEs (Galloway and Mochrie

(2005). SMEs owners/managers might be enthusiastic to adopt ICTs in their business but because they lack staff to implement it, they end up not adopting ICTs (Taylor and Murphy, 2004). In addition, it is very expensive to hire people with technical knowledge to assist SMEs in the process of ICTs adoption taking into account inadequate financial resource of SMEs. Galloway and Mochrie (2005) have also asserted that the availability of ICTs expertise is an enabling factor in the process of ICTs adoption by SMEs. In the absence of this, SMEs find it difficult to buy and maintain ICTs tool.

SMEs generally lack the human technological resources needed for ICTs adoption in their business. Even if owners/managers are aware of the potential benefits of ICTs adoption, the Managers lack qualified personnel to aid in the process of ICTs adoption. This tends to lead to failure to adopt ICTs in business. Hence, without technological capabilities in SMEs, dependence on ICTs, support services for system maintenance can be dangerous and discouraging in ICTs adoption in SMEs. For instance, a firm that undertakes or conducts e-commerce may be affected by computer viruses. In addition, there is the risk of failure of ICTs systems due to lack of human technological capabilities to sustain the entire process. Thus, lack of in-house Information Technology manpower affects the process of ICTs adoption by SMEs (Narula and Arora, 2010; Federici, 2009).

Most SMEs fail to adopt ICTs in their business processes because of lack of financial resources. ICT tools are expensive and beyond the reach of SMEs usually have a limited ability to make large investments in their firms due to lack of financial resources. In some SMEs, Information Technology (IT) budgets are non-existence due to a financial squeeze. In addition, SMEs are generally concerned about the cost of establishing and maintaining ICTs systems since they often suffer from budget constraints and are not sure of the returns on the investment on the new technology (Wainyoike, Mukulu and Waititu, 2012; UNDP, 2007). Maguire *et al.*, (2007) pointed out that SMEs have failed to adopt ICTs because of inadequate

financial resources and skills to adopt ICTs in their business. Furthermore, the problem is compounded in the sense that lack of financial resources makes SMEs not to adopt latest and advanced ICTs.

Pavic *et al.*, (2007) asserted that SMEs lack the human and financial resources and capabilities to adopt ICTs in their business. Generally, lack of financial resources also limits SMEs not to purchase the required ICTs tools for their business and this affects the process of manpower training in ICTs related skills. Esselaar, Stork, Ndiwalana, and Deen Swarray, (2007) argued that SMEs have failed to adopt ICTs in their business because of lack of financial resources and unawareness of the benefits of ICTs.

Lack of government policy pertaining to ICTs adoption in general tends to be a major barrier to ICTs adoption in SMEs. In the absence of policies that assist SMEs in ICTs adoption, SMEs find it difficult to adopt ICTs in their business. For instance, the policy to build modern infrastructural facilities would make internet connectivity to be affordable by SMEs. In addition, ICTs policy for SME would address issues like providing tax incentives in investing ICTs and subsidising ICTs training for SMEs. SMEs policy address issues like provision of financing and business consulting to SMEs, procedures for registration, tax breaks and any other matters which might enable SMEs to adopt ICTs in their business processes. Many SMEs are hesitant to engage the process of ICTs in their business because of underdeveloped legal policy for electronic and security issues related to ICTs usage. Lack of a legal framework to support ICTs or e-business (for instance regulations for online transactions), creates a barrier in ICTs adoption in SMEs (Kannibiran and Dharmalingam, 2012).

The cost of ICTs is also a major barrier to ICTs adoption in SMEs. Cost seems to be a problem to a majority of SMEs. SMEs owners/managers are in a dilemma whether to invest in ICTs where returns on investment are not known. Most SMEs do not have enough

financial resources and therefore, they have to be sure of the returns of adoption of ICTs in their business processes. The problems are compounded since managers have no skills in strategic planning of SMEs and therefore, it becomes difficult to exploit short term innovation (Esselaar *et al.*, 2007; Nguyen, 2009). Chiware and Dick (2008) argued that high cost of ICTs have negatively impacted the process of ICTs adoption in SMEs in developing countries. Similarly, Kari, (2007) and Harindranath *et al.*, (2008) have noted that high costs of ICTs have impeded the process of ICTs adoption by SMEs.

Frempong (2005) pointed out that initial costs involved in the set-up, high cost of ICTs and on-going costs of maintenance of ICTs have made SMEs not to adopt ICTs in their business. Narula and Arora (2010) and Moyi (2003) consented that SMEs have not fully adopted ICTs in their business because of high cost of ICTs, lack of technical skills and Information Technology knowledge.

SMEs are faced with many barriers to ICTs adoption. Tan *et al.*, (2010) argue that unsuitability of ICTs, unavailability of ICTs personnel and network infrastructure, high cost of ICTs, expensive software, costs and returns, uncertainty with ICT and lack of confidence in ICT security have led to the low rate of ICTs adoption in SMEs.

Change in technology is another barrier to ICTs adoption. The technological context may be taken to mean the pool of technologies available in the markets that would be to be adopted by SMEs in their business (Scupola, 2009). The issue whether SMEs will adopt ICTs in their business processes depends on the availability of ICTs in the market. In addition, it depends on the compatibility of the ICTs. Change in technology has posed a great challenge to SMEs. Even with the change of technology, SMEs tend to be unfamiliar with the new technology. This makes the process of adoption to be a bit difficult. There are several reasons why SMEs have not adopted mobile data technologies in their business. These include lack of speed

mobile technologies (most ICTs are slow and inefficient), lack of standardised information technology environment for developing mobile data applications, high costs of usage, limited memory of central processing units, susceptibility to transmission noise, call dropouts, questionable security and standards of ICTs (Harker and Van Akkeren, 2002).

Security and trust of using ICT tools in business presents another barrier to ICTs adoption by SMEs. The perception about unresolved security and privacy issues associated with the use of internet especially in making online payments tends to discourage SMEs owners/managers in adopting ICTs (Taylor and Murphy, 2004; Kimwele *et al.*, 2010; Tan *et al.*, 2010). SMEs owners/managers have not developed confidence in using ICTs to make online payments. There is fear in SMEs owners/managers that some of the information pasted through the ICTs might land on wrong hands while the payment are being made online. This information would be used later for fraudulent purposes. The problem is compounded by lack of a legal framework on security and trust in usage of ICTs. In addition, the language barrier with respect to internet content, which is largely in English, impedes the process of ICTs adoption by SMEs (Chiwere and Dick, 2008). This is especially the case since Kenya has other African languages other than English. Kannibiran and Dharmalingam (2012) argued that information security and confidentiality is one of the main factors which determine whether to adopt ICTs or not. SMEs may face security problems such as payment security, privacy and confidentiality of the information and viruses. Thus, security in the form of confidentiality, integrity, and availability of information is considered as a major barrier to ICTs adoption in SMEs.

The high cost of internet connectivity is considered as a barrier to ICTs adoption by SMEs. It contributes to slowness of internet connections. Esselaar *et al.*, (2007) argued that network problems and unreliable infrastructure are barriers to ICTs adoption by SMEs in many of developing countries. In addition, most of the developing countries use out-dated equipment

which is also state owned and operates in the form of monopolies and the end result will lead to high internet costs, slow internet connection and limited coverage.

### **3.4.2 Internal Barriers to ICTs Adoption**

Internal barriers are factors within the organisation which impede the process of ICTs adoption by SMEs. These barriers include owners/managers not well trained, lack of planning and strategy, and lack of awareness of the benefits of ICTs.

Many of SMEs owners/managers are not well trained in ICTs related skills. The SMEs owners/managers therefore heavily rely on external consultants who sometimes misinform them. This problem is further compounded by lack of ICTs personnel to assist SMEs owners/managers in ICTs adoption. Owners/managers sometimes are enthusiastic to adopt ICTs in their business but because they are unfamiliar with how a computer operates, they become sceptical of the concrete benefits of ICTs adoption in their business processes (Taylor and Murphy, 2004).

SMEs have not adopted ICTs in their business also because owners/managers lack awareness about the potential benefits of ICTs adoption. Marisini *et al.*, (2008); Tan *et al.*, (2008) and Lange *et al.*, (2000) posit that SMEs have failed to adopt ICTs in their business because SMEs owners/managers do not understand the potential of ICTs adoption. SMEs owners/managers have limited ICTs literacy and this makes them not to make good decisions when faced with several alternatives on the type of ICTs to adopt in their business. The experience of owners/managers of SMEs in Information Technology is considered as an enabling factor in ICTs adoption by SMEs, and more especially in allocating the required financial resources and managing the implementation process (Narula and Arora, 2012).

Most SMEs also fail to adopt ICTs in their business because of lack of planning and strategy. SMEs do not have an action plan on how to adopt ICTs in their business. Most SMEs operate

without a vision or a mission of their business. In the absence of mission and vision of the organisation, it becomes difficult for the employees to know what they are supposed to do in a given period. The objectives are not clearly spelled out. Therefore, it becomes difficult to adopt ICTs in their business process. Most of SMEs owners/managers lack managerial skills and qualified personnel to formulate plans and strategies of SMEs. Furthermore, the problem is compounded by insufficient training of SMEs employees (Coskun and Altunisk, 2002; Narula and Arora, 2012). Most SMEs ownership and management are not clearly separated and therefore, policies are formulated by an owner who lacks managerial skills. This trend is not good especially in situations where the business environment is very dynamic and ICTs adoption in business is considered as one of the strategies to compete with other business in the environment. Thus, owners/managers lack the ability to give a strategic direction of SMEs.

Many SMEs owners/managers are also not aware of the potential benefits of ICTs adoption in their enterprises (Rao, 2004). They do not understand the relevance or suitability of ICTs in their businesses due to a lack of information about the benefits of ICTs adoption. SMEs owners/managers fear in investing their scarce resources where returns are not guaranteed (Duan *et al.*, 2002; Tan *et al.*, 2010). The lack of awareness of the benefits of ICTs adoption makes the owners/managers hesitant in adopting ICTs in their business processes. Generally, SMEs owners/managers always act as agent of change in the organisation and therefore, their unawareness of the benefits of ICTs adoption by SMEs automatically acts as a barrier to adoption.

Nguyen (2009) argued that SMEs have failed to adopt ICTs in their business because owners/managers are unclear on how and why firms adopt ICTs in their business. In addition, the misconception on the relationship between the usage of ICTs and firms themselves has made SMEs not to adopt ICTs in their business. On the same issues,

Galloway and Mochrie (2005) argued that lack of information about the perceived benefits of ICTs have contributed negatively in the process of ICTs adoption by SMEs. Taylor and Murphy (2004) consented that SMEs have barriers in the process of ICTs adoption especially SMEs owners/ managers are unaware about the potential benefits of ICTs.

SMEs have not adopted ICTs in their business processes because of the high cost of training of manpower. Harindranath *et al.*, (2008) and Frempong, (2005) pointed that SMEs have failed to adopt ICTs in their business because of lack of skills and resources. Duan *et al.*, (2002) also argued that SMEs have not succeeded in adopting ICTs in their business because of lack of skills, and unavailability of adequate knowledge. Furthermore, SMEs have problems in training their manpower to have the necessary skills to assist SMEs in the process of ICTs adoption.

Difficulty in attracting and retaining qualified personnel who have ICTs related skills in SMEs is a barrier to ICTs adoption by SMEs, a problem further compounded by lack of adequate financial resources. SMEs have failed to attract and retain qualified employees in their business because of lack of financial resources. The much needed qualified personnel at the right time, in the right place to assist SMEs in ICTs adoption are not available in the labour market, or SMEs are not in a position to attract and employ them in their business. SMEs have thus failed to adopt ICTs in their business because of failure to attract and retain qualified personnel (Nguyen, 2009; Marisini *et al.*, 2008; Kari, 2007; Galloway and Mochrie, 2005).

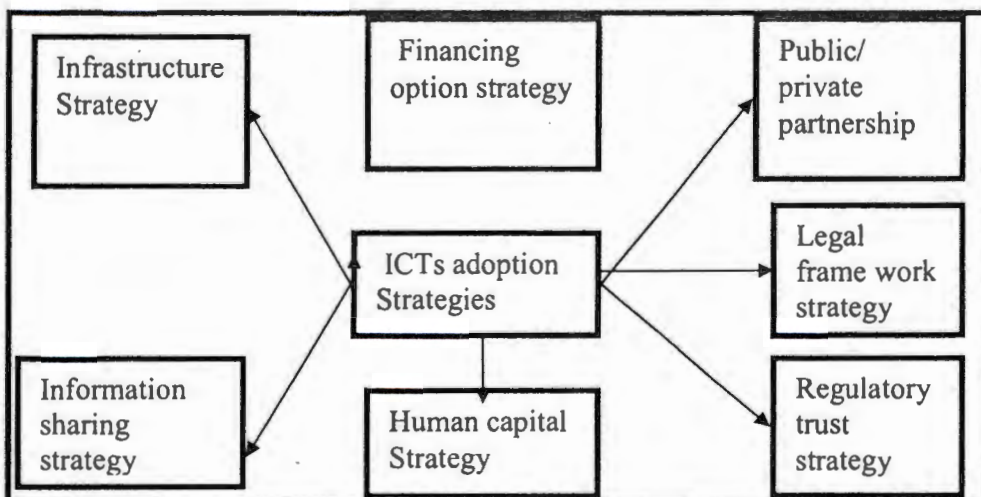
SMEs have failed to adopt ICTs in their business partly because the existing employees do not understand the importance of using ICTs. In addition, ICTs adoption by SMEs becomes very complicated especially when existing employees do not understand how to use ICT tools. Understanding the use of ICT tools by existing staff of SMEs is considered as one of

the enabling factors in ICTs adoption by SMEs. Maguire *et al.*, (2007) and Bordonaba-Juste *et al.*, (2012) concur that SMEs have not adopted ICTs in their business because employees lack the necessary skills to operate ICT tools. Chiware and Dick (2008) also assert that SMEs in Namibia have failed to adopt ICTs in their business because of lack of the necessary information technology skills in SMEs.

### 3.5 Strategies to Lessen Barriers to ICTs Adoption by SMEs

In an era of globalisation, SMEs are likely to be compelled by external and internal drivers to adopt ICTs in order to position themselves strategically in the dynamic business environment. SMEs stand to benefit with a change of strategy in ICTs adoption in their businesses. However, SMEs face many barriers which hinder the process of ICTs adoption. For instance, lack of infrastructure and human capital are some of the barriers to ICTs adoption. Despite of all these barriers, many strategies have been suggested in the literature on how to resolve barriers encountered by the SMEs in ICTs adoption (Narula and Arora, 2010; Middleton and Byus, 2011). The strategies are infrastructure, human capital development, financing, and legal framework as indicated in figure 3.4.

**Figure 3.4 Strategies to Lessen Barriers to ICTs adoption**



Source: Ongori, (2009)

Infrastructure strategy is ideally provided by the government in assisting SMEs by offering them subsidies and encouraging providers of ICTs to have special discounts for SMEs. The government interventions include building of infrastructure, investing in research and development, facilitating technological transfer, creating science parks and creating enabling legal frameworks (UNDP, 2007). In addition, Infrastructure strategy addresses issues on tax incentives for investing in ICTs, subsidising ICTs training for SMEs needs, incentives for e-procurement and other online activities. Similarly, this strategy emphasises the provision for SMEs financing and business consulting services, simplification of registration procedures, provision of tax breaks and creation of incubation centres (Chiwere and Dick, 2008; Mutula and Brakel 2006:410).

Human capital strategy may be adapted as one way of lessening barriers to ICTs adoption by SMEs. The government plays a role in assisting SMEs by hosting training workshops for owners/managers that are flexible and tailored-made to fit the specific requirements of SMEs. Similarly, the government provides subsidies and grants for ICTs training and creating opportunities for firms to try hands on technology (UNDP, 2007:19; Yunis, Koong, Liu, Kwan, and Tsang, 2012). For instance, SMEs owners/managers and other employees are trained on SMEs broad-based courses such as Microsoft office applications, desktop publishing, and webpage design. However, lack of ICTs skills and business skills are impediments for ICTs adoption by SMEs. To promote skills acquisition and development within the SMEs sector, programs are developed to encourage private sector participation in the upgrading of skills within the SMEs. This way SMEs will be in a position to get the manpower with relevant skills in ICTs.

A third strategy to lessening barriers to ICTs adoption is financing. The government needs to put in place mechanisms to boost SMEs in ICTs adoption process by increasing affordability of ICTs through grants, credits, leasing options and tax incentives (UNDP, 2007:19; Chiwere

and Dick, 2008). SMEs have failed to adopt ICTs in their business because of lack of financial resources. Availability of financial resources is considered as one of the enabling factors in ICTs adoption in SMEs. This would assist SMEs to buy modern ICTs and train their employees to have the necessary skills related to ICTs. In addition, SMEs may not be in a position to attract and retain qualified employees in their organisation (Kannabiran and Dharmalingam, 2012). For instance, the Kenyan government has appreciated the role of SMEs and therefore, the government has tried to promote development of the financial services sector by providing incentives to attract savings and investments, and development of venture capital. In addition, the government has established Micro Finance Trust Fund (MFTF) which assists SMEs to get loans at affordable interest rates. Furthermore, the government has encouraged commercial banks to develop appropriate risk classification systems governing loan collateral, documentation and inspection risks for the SMEs sector. This is aimed at encouraging commercial banks to open up lending to SMEs so that SMEs are in a position to buy modern ICTs and train their manpower to have ICTs related skills (Kenya, 2005).

Further, SMEs benefit especially when the government takes an initiative to establish a legal framework to legitimise ICTs usage or adoption in SMEs. This legal policy and regulatory framework would encourage the usage of ICTs in SMEs by removing the restraining forces of ICTs adoption in SMEs and a creating conducive business environment. Some of the internal barriers faced by SMEs will as a consequence be minimised. Internal barriers will be resolved by the owner's motivation and experience to access resources in the form of money and people. With more management focusing on profits rather than on sales, this will make SMEs to develop a stable financial resource (Taylor and Murphy, 2004; Mutula and Brakel, 2006; Chiware and Dick, 2008; Narura and Arora, 2011).

The regulatory trust strategy addresses issues like security, privacy and consumer protection. These encourage SMEs owners/managers to have trust in using ICT tools in their business processes. Lack of trust in using ICTs tools has been a big impediment in ICTs adoption in developing countries (UNDP, 2007). In addition, the regulatory trust strategy addresses issues related to cyber-crimes and cyber security, spam and presence of low-cost online dispute resolution mechanisms among the firms themselves and between firms and consumers. This will create trust in the usage of ICTs by SMEs and enhance the degree of ICTs adoption in their business (Narula and Arora, 2010; Kimwele *et al.*, 2010).

In addition, information sharing and dissemination is an important strategy to lessening barriers to ICTs adoption. SMEs benefits greatly by getting comprehensive information on the benefits of ICTs adoption in their business processes. SMEs owners/managers lack some objective information regarding the benefits and costs of ICTs adoption in their businesses. Information sharing strategies encourage the private sector such as business associations to share information freely with SMEs. Raising awareness about the benefits of ICTs adoption will encourage SMEs owners/managers to adopt ICTs in their business because they will understand and appreciate the importance of ICTs adoption (Kapurubandara, 2009). Information sharing especially on the barriers and benefits of ICTs adoption by SMEs increases chances of ICTs adoption in SMEs. Many scholars have advocated that information sharing is one of the critical factors for the sustainability of SMEs (Chiwere and Dick, 2008; Kari, 2007; Middleton and Byus, 2011). Information sharing includes the gathering, processing and packaging of information in line with the needs of SMEs. For instance, the Kenyan government should encourage private sector investment in information centres for SMEs. These centres should disseminate information generated within the SMEs sector.

A final strategy is the public-private partnership strategy. The private-public partnerships strategy develops effective e- business policies for SMEs (UNDP, 2007). The public sector

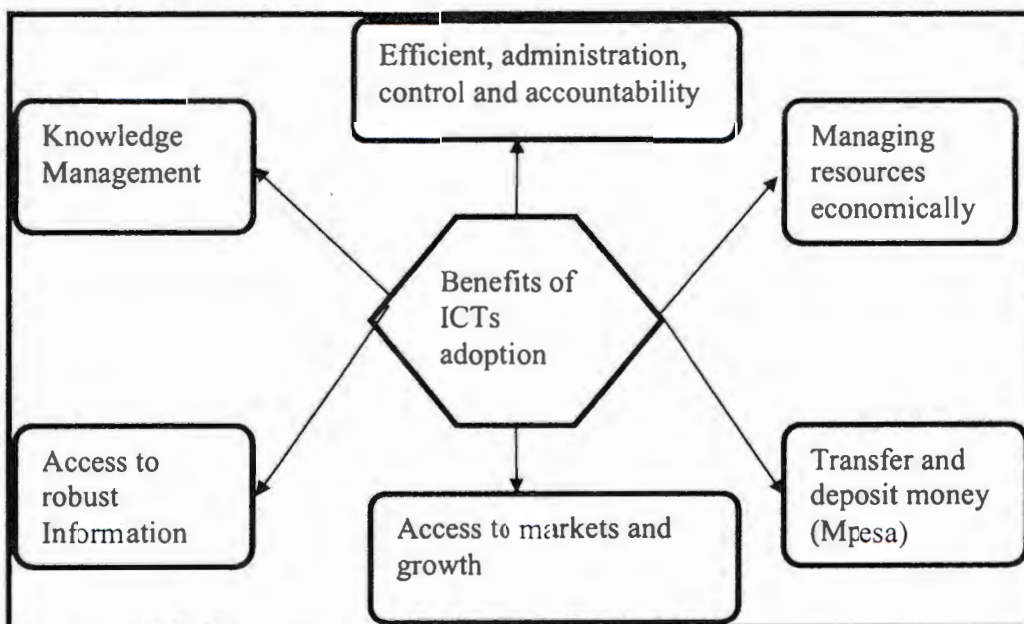
plays a role in promoting ICTs adoption in SMEs while the private sector encourages dynamic leadership to assist SMEs in ICTs adoption. The government always remains vigilant in order to ensure that regulations are implemented and followed more especially on ICTs adoption by business (Kapurubandara, 2009). In addition, the government, where necessary, promotes a fair playing field and restricts companies from competing in free and fair markets environment.

### 3.6 Benefits of ICTs Adoption by SMEs

In the contemporary business world, ICTs tend to enhance the competitiveness of business enterprises. ICTs have enormously contributed to improved knowledge management, access to robust business information, efficient administration, control and accountability, access to markets and growth of SMEs in both the developed and developing economies. ICTs also tend to contribute economically and effectively to the management of enterprise resources.

This is shown in figure 3.5.

**Figure 3.5 Benefits of ICTs adoption by SMEs**



Source: Ongori, (2009)

One of the accruing benefits of ICTs adoption is improved knowledge management. Knowledge management has become a critical element in strategic planning of SMEs (Durst and Wilhelm (2012). Further, ICTs adoption enables SMEs to forge strategic alliances with other firms in the environment especially by linking them to external sources of knowledge (Maguire, Koh and Magrys, 2007). ICTs adoption in SMEs improves organisations' capability, survival, and growth and maintains a competitive advantage (Hussain, Xiaoya, Wang, Si, and Ahmed, 2011). ICTs assist SMEs owners/managers in knowledge management especially with processing of useful information which is the key elements in the decision making processes. This information regards data, knowledge and the processes derived from individuals and organisations (Iancu, Colomeischi and Cibotriariu, 2013). ICTs adoption in SMEs improves the management of a stock of knowledge in business in the sense that SMEs owners/managers will be in a position to track employees' turnover and absenteeism so that they will develop interventions to minimise these challenges and enhance their knowledge stock in their business. Thus, without ICTs to monitor the employee movements in organisation will be very difficult and lead to failure in developing appropriate interventions in reducing employee turnover/absenteeism.

Another benefit of ICTs adoption is improved access to robust business information. ICTs are key tools for accessing business information that would lead to organisational effectiveness (Irani, 2002:12). ICT tools enable information to be electronically stored, accessed, delivered and retrieved for use in the organization for decision making (Schware, 2003; Brunn, Jensen and Skovgaard, 2002; Hurwitz, 2000). Tools such as the Internet aids in information search which can be used in the organisation for strategic planning of the business. In addition, ICT are used in SMEs as effective tools for improving external communications and provides quality of services for established and new customers (Lukacs, 2005:4; Stockdale and Standing, 2004; Weil and Vitale, 2001; Apulu and Latham, 2012). The tools are no longer

viewed as a technical “service”, but as a critical resource to enhance the competitiveness of SMEs in any business environment (Kohli and Devaraj, 2004; David, Schuff and Louis, 2002; Tumolo, 2001). Further, ICTs adoption in SMEs provides new ways to store, process, distribute and exchange information both within the firm and with customers and suppliers in any business environment (Kimwele, et al., 2010; Adebambo and Toyin, 2011; Bayo-Moriones, Billion, and Lera-Lopez, 2013).

The adoption of ICTs is also essential for the efficient administration of SMEs, and in the delivery of quick services. SMEs owner /managers would access information quickly which is captured in ICTs to make informed decisions of the business. Furthermore, Mutula and Brakel (2006) asserted that most SMEs across the world were increasingly adopting ICTs tools to enhance their e-readiness status to identify, acquire, organise, disseminate and apply information for decision making. ICTs play a profoundly significant role in strengthening the accountability systems of business enterprises. This roles includes and is not limited to tracking the performance of employees and implementing budget processes (Carlos, 2007). Along the same line, Apulu and Latham, (2012) argue ICTs adoption by SMEs has the ability to enhance, coordinate and control the operations of the business and increase the use of management systems.

Accessibility to markets and growth is also a major benefit of adopting ICTs by SMEs. As the world economies continue to move towards increased integration because of the advances in information communications technologies, SMEs are likely to derive more benefits by participating in regional and international markets. ICTs adoption in SMEs is critical for their survival in the era of globalization. For instance, in the Caribbean, several SMEs have grown and expanded into international markets largely by using ICTs, improving customer service and information access. In Jamaica, for instance, there is an increasing adoption of ICTs in the SMEs sector, which is attributed to increased awareness and declining global costs of

hardware and software (Southwood, 2004). In Singapore, ICTs adoption has greatly contributed to the growth of SME businesses and their competitiveness both regionally and globally (Saheer and Chris, 2003). Finally, ICTs adoption in SMEs help in improving their internal process, leads to faster communication with customers and better distributing of their products through online (Kannabiram and Dharmalingam, 2012; Apulu and Latham,2012). Eei, Husain and Mustaffa (2012) argued that ICTs adoption in SMEs assists SMEs to forge close relationships with their regular customers and suppliers, leading to improvement in their relationships and market position.

SMEs can manage resources economically and effectively by adopting ICTs. The seamless transfer of information through shared electronic files and networked computers has increased the efficiency of the business in terms of documentation, data processing and other back-office functions like organizing incoming orders and preparing invoices. ICTs adoption in SMEs tend to significantly reduce the operational costs in terms of material procurement and transactions costs, resulting in lower prices for intermediate and finished goods and leads to improvement in the value of their output (OECD, 2004; Gilbert, Balestrini and Littleboy, 2004). In China, the vibrant and promising growth of internet business is highly encouraged in SMEs in order to manage resources effectively and efficiently (Martin and Matlay, 2001). Furthermore, ICTs adoption in SMEs assists SMEs owners/managers in managing their resources economically. For instance, ICTs assist in tracking the usage of materials in the firm and this in the long run would lead to increase in revenue of SMEs.

A final benefit is the transfer and deposit of money through online systems such as MPESA. MPESA is derived from the Swahili word PESA, meaning cash. MPESA allows the user to make the following transactions namely, transfer of money from one person to another; this works only if the owner of the mobile phone has enough money in his phone. The recipients will withdrawal cash at designated outlets. In addition, one can get loan approval information

and make loan repayments by the use of the mobile phone. For instance, mobile phone money transfer (MPESA) has assisted SMEs owners/managers in rural areas where banking facilities are not available to deposit money into their mobile phones even if it is a public holiday or a weekend or past normal banking hours. The intended recipient would get money without travelling long distances to town where banking facilities are available in order to withdraw cash or deposit money in his account. Otherwise, in rural areas SMEs owners/managers make payments and transfer money frequently and in the long run mobilising savings which would have an impact in the economy in terms of savings mobilisation. Omwanza (2009) posits that MPESA is also used in paying school fees, sending pocket money, paying a drink in a local club, making loan payments, submitting contribution to fund drives, paying for public transport and keeping money safe in a virtual checking account.

### **3.7 The Role of Government Support to SMEs**

The contributions of SMEs to the economy can further be enhanced and strengthened through ICTs adoption. The adoption of ICTs by SMEs will create jobs, public increase revenue and generally raise the standard of living. In general, a number of specific steps have been taken by the government to promote access to and use of ICTs by SMEs (Kenya, 2006).

Firstly, the government has encouraged SMEs business to deal with the government in business transactions. This tends to promote the SMEs and encourage them to use modern ICTs in their business in order to provide quality goods and services to the government and other consumers.

Secondly, the government has made a deliberate effort to adopt ICTs in providing their services to SMEs. This is intended to provide better and more transparent services to their clients. In addition, SMEs tend to get a lot of services from the government in terms of

customs clearances, business licenses and dispute resolution mechanisms in order to promote and strengthen their capacity.

Thirdly, the government has embarked on a process of drafting and enforcing legal policy and regulatory framework that encourages the use of ICTs in SMEs. The policy would address the issues related to restraining forces of ICTs adoption in SMEs and by creating conducive business environment.

Fourthly, the government of Kenya is trying to consolidate and harmonise the trade licensing and regulation services. The licensing services will be decentralised to cut down the cost and time wasted by the entrepreneurs travelling to cities to acquire the licenses for their business. For instance, the Trade licence will be reviewed and streamlined to address the needs of SMEs.

Fifth, the labour laws will continue to be reviewed to meet the needs of the employer and employees as per the employment Act (cap 226) and the regulation of wages and conditions of employment Act, (Cap 229). Similarly, the factories and other places of work Act (Cap 514) will be continuously reviewed to accommodate the needs of SMEs.

Sixth, the government recognises the need for SMEs to access justice and have their disputes resolved amicably by putting in place the mechanism of arbitration and disputes resolution to address the concerns of SMEs in dispute resolution. This promotes cordial relations in SMEs among the employer and employee, individual employee and individual employee, employer with the government and employer with other stakeholders.

Seventh, on the issue of markets and marketing of SMEs products, the Kenyan government is committed to providing opportunities to SMEs by accessing the existing market information through the Export and Promotion Council centres. This information assists SMEs to have

accessibility to international markets and be able to sell their products online. Kenya missions abroad are also tasked to intensify in publicity and dissemination of information available on opportunities related to the external markets so that SMEs market their products. In addition, the government is committed to allocation of at least 25 percent of procurement to SMEs.

Eighth, the government recognises the importance of access to credit and financial services as a key factor for the success and development of SMEs. Therefore, the government will establish trusts which will take care of the financial needs of SMEs. One such venture is the establishment of a Micro Finance Trust Fund (MFTF) from which SMEs can borrow at reasonable rates. There is also the creation of Micro Enterprise Support programme Trust (MESPT) where most of the finance would be transferred to meet the needs of SMEs. In addition, the government encourages commercial banks to develop an appropriate risk classification system to govern the lending to SMEs by taking into account their collateral security availability.

Ninth, the government is also addressing the issue of skills transfer and technology to Kenyan SMEs. The government, through relevant institutions such as Kenya Industrial research Development Institute (KIRDI), National Council of Science and Technology (NCST), Kenya Industrial Estates (KIE), Kenya Bureau of Standards (KBS), and Productivity Centre of Kenya (PCK), defines laws and provides legislation that would; regulate and promote local and international technology transfers, encourage partnerships through sub-contracting, franchise and license, vet and register imported technologies in order to discourage the dumping of obsolete technologies from the more developed world which impede the process of innovation.

Skill acquisition which SMEs need would be addressed by encouraging private sector participation in skills upgrading of SMEs. In addition, the government is encouraging



university industrial attachment in addition to the technical and business attachment in order for trainees to get practical experience in the SMEs sector. Similarly, Technical Training institutions, SMEs Training, and Demonstration Centres, Youth Polytechnics and National Youth Services (NYS) skill development centres are used to address the skill needs of SMEs.

Finally, infrastructure development can be enhanced by a collaboration between the private sector and government. In addition, the government will engage other stakeholders to develop and manage market stalls and worksites for SMEs. This would be achieved by leasing of land to developers at concessionary rates and granting incentives to such developers. This will encourage less worry by entrepreneurs on the issue of land. In addition, to addressing issue of land tenure authorities will be encouraged to issue Temporary Occupancy Licenses (TOLs) for longer and specified period.

### **3.8 Kenya National Information and Communication Technologies (ICTs) Policy**

Many countries that have encouraged the use of Information and Communications Technologies (ICTs) have attained significant social-economic development. The countries are rapidly transforming into information and knowledge-based economies. Kenya is a country on the Eastern Coast of Africa which covers a surface area of 582,664 square kilometres with a total population of about 40 million. The introduction of Kenya telecommunication services started in 1977, initially managed as part of a regional network with neighbouring Tanzania and Uganda as East African Community (EAC). The regional communication services collapsed and this forced the Kenyan government to establish Kenya Posts and Telecommunications (KP&TC) body to run their telecommunications services.

The main objective for this sector was to optimize its contribution to the development of the Kenyan economy as a whole by ensuring availability of reliable and affordable communication services. The growth of ICTs sector in Kenya has been significantly

influenced by global trends. To exploit telecommunications services for development, it was very necessary that cheap and reliable telecommunications services be made available to all consumers.

The government later reviewed its policies to address the application of telecommunication as part of the strategies to enhance information and communication technologies. Telecommunications and Postal Sector policy guidelines gazetted in 2001 recognized the role of telecommunication in promoting ICTs in Kenya. The policy guidelines were developed to optimize the use of ICTs in all national development activities of the economy including SMEs (Kenya, 2006). Thus, the policy was aimed at increasing and transforming modern businesses by enabling rapid, reliable and efficient exchange of large amounts of information.

The Kenyan National Information and Information Communication Technologies policy remained in a draft stage for several years because of disjointed institutional framework for policy development, lack of high level ICT champions in government and lack of adequate sustainable funding for ICT (Kariuki, 2009). Partly as a result, the Kenya Communication Act of 1998 repealed the Kenya Post and Telecommunications Act and established:

- CCK as the telecommunication, radio and postal sector regulator
- National communication Secretarial (NCS) to serve as a policy advisory board
- Communications Appeals Tribunals
- Telkom Kenya Ltd
- Postal Corporation of Kenya

### **3.8.1 Challenges of ICT in National Development**

There are many challenges of ICT in national development which include policy, legal and regulatory framework, ICT infrastructure and human development. The policy, legal and

regulatory frameworks were initially considered under various legislations such as The Science and Technology Act, Cap 250 of 1977, the Kenya Broadcasting Corporation and the Kenya Communication Act of 1998. However, these were inadequate in addressing the issues of convergence, electronic commerce and e- government (Kenya, 2006). Therefore, there was need for a comprehensive policy, and legal framework to:

- Support ICT development, investment and application;
- Promote competition in the industry where appropriate;
- Ensure affordability and access to ICT nationally
- Address issues of privacy, e-security, ICT legislation, Cyber-crimes, ethical and moral conduct, copyrights, intellectual property, rights and privacy.
- Support research and development in ICT
- Develop an institutional framework for policy development and review.

Lack of adequate ICT infrastructure has hampered provision of efficient and affordable of ICT services in the county (Kenya, 2006). Therefore, the emphasis is placed on:

- Provision of support infrastructure, such as, energy and roads
- Support for local manufacturers and assembly of ICT equipment and accessories
- Provision of incentives for the provision of ICT infrastructures.

Human resource development is critical in the process of ICTs adoption by businesses. The ICT policy recognises the role played by various institutions in providing ICT education and training (Kenya, 2006). Thus, there is need to strengthen and streamline the training through:

- Promoting ICT in education at primary level, secondary, tertiary, and community level by developing ICT curricula and ensuring that teachers / trainers possess the right requisite skills,
- Setting up a framework for evaluating and certifying ICT training programmes,
- Developing mechanism for attracting and retaining skilled human resources,
- Establishing networks for sharing training resources and
- Developing strategies to support research and innovation.

Universal accessibility of ICTs is a major challenge to ICT adoption. ICT services are limited to a few major towns in Kenya (Kenya, 2006). Thus, there is need to increase universal accessibility through provision of adequate resources to the ICT sector, development of requisite ICT infrastructure, creation of incentives for service providers to deploy services in rural and under-served areas, establishment of a universal fund, creation of awareness of benefits of ICT to the public and development of knowledge-sharing networks at grassroots level.

Finally, the ICT policy also cited Public-Private Partnership (PPP), e-government, electronic commerce, content development, electronic security, ICT development, engendering ICT and youth and ICT as some of the challenges that need to be addressed to enhance ICT adoption in businesses.

### **3.9 Summary**

This chapter has focused on the literature review on ICTs adoption by SMEs in developed and developing economies. The literature review has contributed to the identification of the problem under investigation and delimitation of the major variables of the study. This chapter highlights the driving forces (factors) which influence ICTs adoption by SMEs. For instance, SMEs are compelled to adopt ICTs in their business processes because of internal and

external drivers. Secondly, barriers to ICTs adoption are discussed. SMEs have not enjoyed the benefits of ICTs adoption because of these barriers that have negatively hindered the process of ICTs adoption by SMEs. SMEs are faced with many barriers in ICTs adoption process and these include, lack of financial resources and managers not being aware of the benefits of ICTs adoption. Thirdly, strategies have been suggested to lessen the barriers of ICTs adoption by SMEs and increase use of ICTs in SMEs. It is believed that once these strategies are in place the degree of ICTs adoption in SMEs would be enhanced.

The strategies that have been suggested to lessen barriers to ICTs adoption in SMEs include human capital; finance, infrastructure, and legal framework have been discussed. By lessening barriers to ICTs adoption by SMEs enhances the chances of ICTs adoption by SMEs. Therefore, SMEs will benefit in terms of access to international markets and robust access to information. Finally, the role of the government support in SMEs to adopt ICTs in their business processes like extending credit to buy ICTs tools have been discussed.

Chapter 4 that follows presents the research design and methodology adopted for the study. The chapter elaborates the roadmap used to achieve the main purpose of the study.

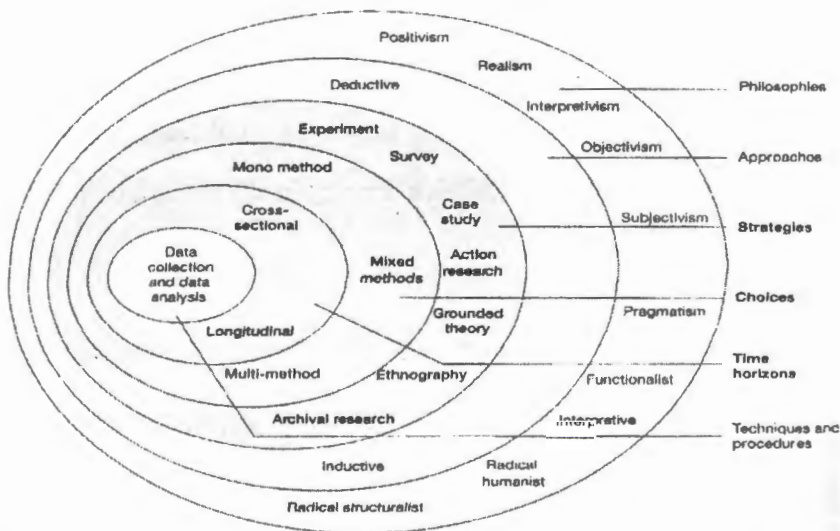
## CHAPTER 4

### RESEARCH DESIGN AND METHODOLOGY

#### 4.1 Introduction

This chapter provides the plan, the methods, and the instruments used in the collection, analysis of primary data. The research process onion (figure 4.1) provided by Saunders, Lewis, and Thornhill (2007) provides the methodological framework used in the current study. The key advantage of this framework is that it leads the researcher through the research process in a step-by-step manner, thus guaranteeing quality results that relate to the research objectives. The subsequent sub-sections address the following; research design, research methods, population and sampling framework, the data processing techniques and research ethics of the study.

**Figure 4.1 Research process Onion**



Source: Saunders, Lewis and Thornhill, (2007:132)

#### 4.2 Research Design

Research design refers to a plan for a study, used as a guide in collecting and analyzing data (Churchill and Iacobucci, 2002). It forms a framework of the entire research process and is a

central part of any research activity. The primary purpose of research design is to guide the researcher in order to find solutions for the problem investigated. Basically, the research design addresses issues like what variables (concepts) to be studied, how these concepts are to be measured, which approach to be used to study the problem, which variables are studied, how data will be collected and analyzed, and finally how the information collected will be systematically presented to solve the problem under investigation.

#### **4.2.1 Research Philosophy**

Research philosophy is critical in any research project as it provides the perception of reality that invariably influences the quality and value of research outcomes (Given, 2006). There are three research philosophies that dominate the literature namely: Positivism, Interpretivism, and Realism (Saunders *et al.*, 2007; Sobh & Perry, 2006; Chisnall, 1997).

Positivism assumes that there exists a real world of a social and physical phenomenon which is objective and tangible hence can be analysed in an apparently value-free manner (Riley *et al.*, 2000; Chisnall, 1997). This philosophy emphasises the use of a structured methodology to facilitate replication, typical in natural-scientific investigations (Saunders *et al.*, 2007). Although it is appropriate in physical sciences, it is most likely to be inappropriate in complex social science phenomenon typical in business and management situations as is the case with SMEs, the focus of this study (Given, 2006).

The Interpretivism philosophy holds that the social world is seen as socially constructed on the basis of shared meanings that are subjective (Riley *et al.*, 2000), hence holding the world as external and objective to facilitate replication as claimed by the positivism philosophy is unrealistic (Saunders *et al.*, 2007). Interpretivists echo that it is necessary to explore the subjective meanings motivating people's actions in order to understand reality (Given, 2006). Critiques have faulted this paradigm for its incommensurability of perceptions and thus its

inappropriateness in this research study on ICTs in SMEs (Sobh and Perry, 2006). Finally, Realism philosophy holds that reality exists independent of human thoughts and beliefs (Given, 2006). That is, realists believe that there is a real world out there to discover such as in ICTs adoption and utilization in SMEs, especially, in Kenya where this study was conducted. Sobh and Perry (2006) observe that there are no objective grounds for choosing a philosophy, all that what one can do is to work within a paradigm that is consistent with research objectives. Saunders *et al.*, (2007) asserts that business and management research often use a mixture of positivism and Interpretivism. The realism paradigm is adopted in this research to ensure that the results are realistic.

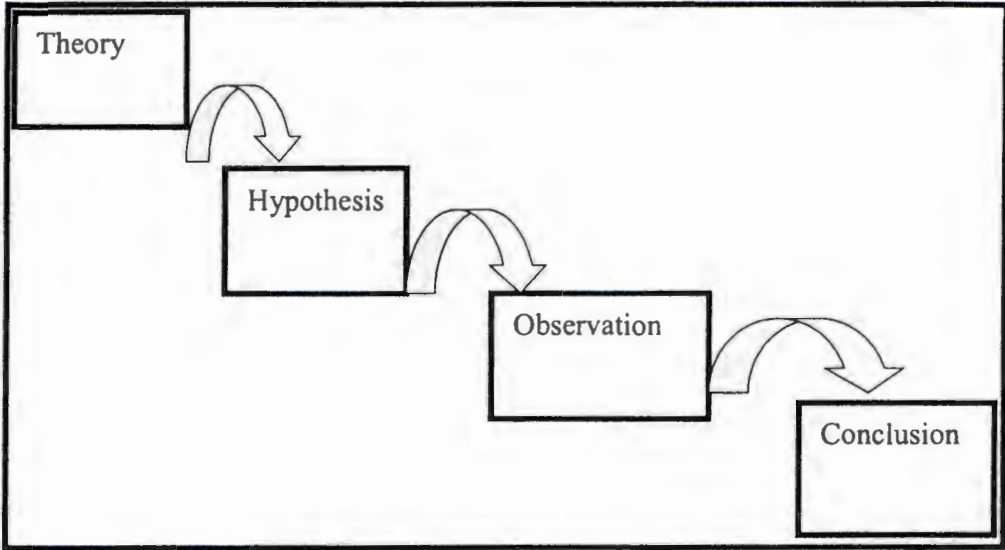
#### **4.2.2 Research Approach**

There are two basic types of research approaches: deductive and inductive (Saunders *et al.*, 2007). The deductive approach involves development of a model that is subjected to a rigorous test, which is dominant in natural sciences whereas the inductive approach involves collection of data and building of a model as a result of data analysis and review of the existing literature on the topic being investigated (Leedy and Amrod, 2010; Riley *et al.*, 2000; Wright and Crimp, 2000). Since this study involved both quantitative and qualitative data, triangulation of the inductive and deductive approaches was adopted in this study for quality research results, since using a variety of approaches increases validity of results (Sobh and Perry, 2006). Researchers like Saunders *et al.* (2007) argue that it is advantageous to combine deductive and inductive approaches in the same research for high quality research results.

The deductive stance helped the researcher to review the literature as indicated in chapter 3. The approach aided in the problem definition. The collection of data and building of the model as a result of data analysis typify the inductive stance. In addition, the deductive

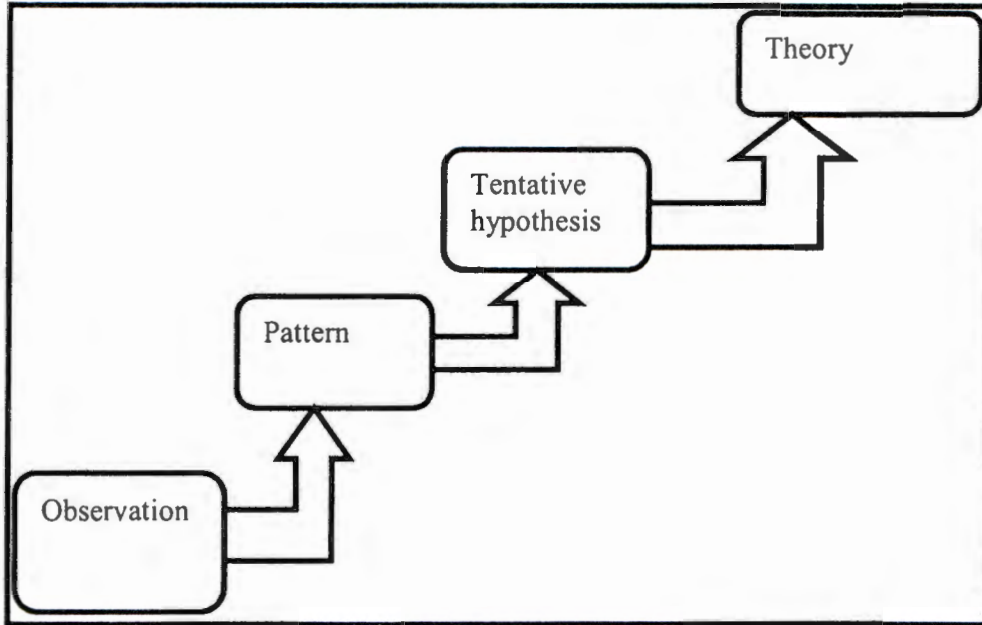
approach works from general to more specific (top down approach) while inductive approach works from moving from specific observations to broader generalizations and theories (bottom-up approach) as indicated in figure 4.2 and 4.3 respectively.

**Figure 4.2 Deductive Approach**



**Source:** Saunders, Lewis and Thornhill, (2007)

**Figure 4.3 Inductive Approach**



**Source:** Saunders, Lewis and Thornhill, (2007)

#### **4.2.3 Research Strategy**

Saunders *et al.*, (2007:135) provide a concise list of major research strategies: experiment, survey, case study, action research, grounded theory, ethnography, and archival research. The researchers posit that no research strategy is inherently superior/inferior to any other. Hence, the choice of each should be guided by the extent to which it will enable the researcher to answer the research questions and meet the research objectives. Wilson (2003), Wright and Crimp, (2000) further assert that the extent of existing knowledge, time and other available resources to the researcher are equally critical considerations for the choice of research strategies to adopt.

Given the research objectives that guide this research, a cross-sectional survey research strategy was used in this study. This design has been used in previously related studies (Chiware and Dick, 2008; Maguire, *et al.*, 2007; Sharma and Bhagwat, 2006; Vachara and Derek, 2006; Martin and Matlay, 2001). Furthermore, the survey design will greatly increase

our knowledge about what happens in the study context and data is collected in a particular single period of time (Ghauri and Gronhaug, 2005; Saunders *et al.*, 2007; Cohen and Levintal, 1990, Davis, 2005).

### **4.3 Research Methods**

High quality research demands that appropriate methods for collection of primary and secondary data are used to address the research problem (Churchill and Iacobucci, 2002). The methods used were broadly categorized into qualitative and quantitative methods. Qualitative methods are often concerned with motivations and behaviours of people, consumers, and organizations (Zikmund, 2003) and are quite useful in exploratory stages of the research.

Quantitative methods are more appropriate in descriptive research where much emphasis is on application of basic statistical techniques to collect, analyze, and present data (Wilson, 2003). This research adopted a mixed research strategy. Ideally, both qualitative and quantitative methods are seen to be mutually supportive rather than exclusive (Wright and Crimp, 2000). The two research methods were used in this study. The quantitative method used survey questionnaire. It is worth noting that it is necessary to triangulate data by using more than one method. However, two research methods may also be used for different purposes in the study (Saunders *et al.*, 2007). This approach of triangulation of research methods have been used by researchers in conducting related investigations (Babbie, 1990; Gill and Johnson, 1997; Cassell *et al.*, 2002; MacGregor, 2004; Okpara and Pamela, 2007).

#### **4.3.1 Secondary Data Collection**

Secondary data refers to the information that has previously been gathered for some purpose other than the current research project (Wilson, 2003:34). This covers literature review and documentary analysis which provided the basis for primary data collection and analysis. Chapter three provided an authoritative expansive literature review on the research problem

for good practice of ICTs adoption and usage in SMEs, reviewed from a wide range of authentic texts and journals from libraries, and electronic resources. This has been reinforced with further analysis of ICTs documentation relevant to ICTs adoption by Kenyan SMEs. This assisted the researcher to have a holistic analysis and diagnosis of the research problem, answering research questions satisfactorily in achieving the research objectives.

### **4.3.2 Primary Data Collection Methods**

Different primary data collection methods are used in different situations. For instance, observation, interviews, and questionnaires are applied to get the necessary primary data (Welman *et al.*, 2005; Saunders *et al.*, 2003; Wilson, 2003).

#### **4.3.2.1 Observation Method**

Observation involves the systematic observation, recording, description, analysis, and interpretation of peoples' behaviour (Saunders *et al.*, 2003:220). This method is more concerned with what people do, by watching them do it. There are two types of observation: participant observation which is qualitative and its emphasis is on discovering the meanings that people attach to their actions. Structured observation is quantitative and is more concerned with the frequency of those actions. For this research, however, this method was not used since it is time consuming and has significant observer effect.

#### **4.3.2.2 Interview Method**

An interview is a purposeful discussion between two or more persons (Kahn and Cannel, 1957, cited in Saunders *et al.*, 2003:245) and is qualitative in nature. Interviews are useful in the collection of valid and reliable data relevant to the research questions and objectives. Barnes (2001) points out that research of this kind lends itself to the semi-structured/unstructured questions to allow the interviewer to probe deeply, and solicit

expansive responses, uncovering previously hidden details in the inquiry. The two broad types of interviews are in-depth one-to-one and focused group interviews.

#### **4.3.2.3 Focus groups Interview**

Focus groups are important in data collection because, first, they are a great way to gather a lot of information from relatively large numbers of people in a relatively short period of time. Second, focus groups can generate insights into topics that previously were not understood. Third, the focus groups help the researcher to understand how members of the group arrive at their conclusions. By having participants express themselves freely the researcher will be in a position to dissect each individual's motivations and determine critical steps along the way toward deciding what is truly important to the members of the group and to the topic under investigation. The group focus also encourages group interaction, which brings various viewpoints together, thus enriching the data collection process (Salkind, 2006:204). It is critical to note that the excellent functioning of focused group interviews requires that the researcher only acts as a moderator or facilitator, so as to minimize problems of bias and optimise participation. Typically, a focus group interview may range from about four to ten participants, depending on the envisaged level of complexity likely to accrue from the use of this means to collect and record data (Saunders *et al.*, 2003:271).

#### **4.3.2.4 The Survey Instrument**

Questionnaires are the backbone of most surveys and require careful planning and execution (Chisnall, 1997). Hence, great skill was used to design an effective series of questions on the survey instrument. The survey instrument was developed based on previous empirical work experiences in both developed and developing economies (Chiwari and Dick, 2008; Maguire *et al.*, 2007; Sharma and Bhagwat, 2006; Neuman, 2000). A questionnaire has been the most popular instrument used in collecting data in quantitative research design based studies

(Mugenda and Mugenda, 2003). Further the questionnaire is conveniently used because it is cheaper and quicker to administer (Wanjau *et al.*, 2012). The questionnaire had a combination of both closed and open ended questions. The open ended questions were used to allow respondents to give broad responses on a range of issues addressed by the study.

The questionnaire was divided into eight sections that had distinct constructs. Section 1 consisted of respondents demographics; section 2, business profile; section 3, drivers of ICTs adoption; section 4, ICTs tools used in SMEs, section 5, barriers to ICTs' adoption; section 6, strategies to resolve barriers; section 7, benefits of ICTs, and section 8, the role of the government in ICTs adoption by business enterprises (Refer to appendix 1). The items in each construct were measured on a 5 point Likert- Scale (5-strongly agree to 1-strongly disagree).

Ideally, the survey questionnaire was designed in such a way that it solicited the data required in the constructs and minimised the risk of non-response from the respondents. This observation is emphasised by Wilson (2003). Four hundred and fifty (450) questionnaires were administered to the sample of the study, delivered by hand and collected later by the researcher, to maximise on the response rate from the sampled respondents. This questionnaire distribution strategy is likened to the 'drop and pick' strategy, with an advantage that it is free from bias of the researcher, where answers are given by respondents own words, who have adequate time to respond to the questionnaire and their results can be made more dependable and reliable (Saunders *et al.*,2007; Neuman,2000). The questionnaire draft was first piloted to a group of ICTs experts and SME owners/managers. The purpose was to clarify wording of question items and variables to help enrich the questionnaire for its validity and reliability before its final distribution.

### **4.3.3 Target Population**

A population is defined as a complete set of individuals, cases or objects with some common observable characteristics (Mugenda and Mugenda, 2003). Therefore, the target population consisted of a distinct group of stakeholders who constitute SMEs were using ICTs in their business, where SMEs are defined as those enterprises employ 11 to 100 employees. SMEs owners/managers in the three selected provinces namely Nairobi, Rift Valley and Nyanza were selected for the study. In order to get a holistic view of the problem investigated SMEs owners/managers operating businesses of Metal and Fabrication and Furniture and Wood of SMEs sub sectors in Nairobi, Nakuru and Kisumu provincial headquarters were targeted for the study. This was done intentionally in order to get an insight on ICTs adoption in the two sub sectors of SMEs selected. In addition, owing to the restrictions of time, money and above all access, it is not possible for one to conduct a census and thus sampling is preferred for feasibility of achieving the objectives of the study.

### **4.3.4 Sampling Design**

A sample is a sub-set of a larger grouping of a population (Riley et al, 2000:30). There are two broad types of sampling techniques, probabilistic and non-probabilistic (Saunders *et al.*, 2007). Due to the nature of research questions and objectives, stratified-random sampling was appropriate for the study. Stratified random sampling was used as it allowed the researcher to obtain a higher degree of representativeness of the SMEs in the sectors under investigation, thus reducing the probable sampling error (Mugenda and Mugenda, 2003; Ghauri and Gronhaug, 2005; Welman, Kruger, and Mitchell, 2005; Saunders *et al.*, 2007).

The study covered the SMEs in three provinces in Kenya, namely Nairobi, Nyanza and Rift Valley. The three provinces were selected for the study because of their economic significance and concentration of SMEs. The target SMEs were first stratified according to

the provinces of study: Nairobi, Nyanza, and Rift valley. From each province, these SMEs were further stratified into the two sub-sectors: Metal and fabrication and furniture and wood.

#### **4.3.5 Determination of the Sample Size**

The sample size selected is usually dictated by the purpose of the study, population size, the risk of selecting a bad sample and allowable sample error. In determining the sample size for this study, the following key elements were taken into consideration.

First, is the level of precision. This is the sampling error which is the range of the true value of the population is estimated to be. The range is usually expressed in percentage points (e.g.  $\pm 5$  percent). For instance, if the researchers find that 60 percent of the population of the sample have adopted a recommended practice with a precision rate of  $\pm 5$  percent, then one can conclude that the range between 55 percent and 65 percent firms of the population have adopted the practice (Bartlett, Kotrlik, Higgins, 2001).

Second, is the confidence level. This is the confidence of the risk level ideas is encompassed under the central limit theorem. The key idea encompassed on the central limit theorem is when the population is repeatedly assembled; the average value of the attribute is obtained by those samples equal to the true population value. In a normal distribution, approximately 95 percent of the sample values are within standard deviations of the true population value (e.g. mean). This means that, if 95 percent confidence level is selected, 95 percent out of 100 samples will have true population value within the range of precision specified (<http://edis.ifas.ufl.edu/pd006>; Bartlett *et al.*, 2001).

Thirdly, the degree of variability in the attributes being measured refers to the attributes in the population. Generally, the more heterogeneous the population is the larger the sample size that is required so as to obtain in a given level of precision. It should be noted that a proportion of 50 percent indicates a great level of variability than either 20 percent or 80

percent. This means that 20 percent and 80 percent indicates that a large majority do not have or do have, respectively the attribute of interest. Thus, the proportion of .5 indicates that maximum variability in a population. It is often used in determining a more conservative sample size, that may be large than if the true variability of the attribute were used (<http://edis.ifas.ufl.edu/pd006>).

Thus, in any research the following strategies are used for determining the appropriate sample size of the study. The census strategy is used especially when the sample size is small. If the sample is small, it is always recommended that to get an insight on the problem under investigation census strategy should be applied. In applying census strategy, one tends to eliminate the degree of sampling error and provides data on all the individuals in the population. In this study, the census strategy was not applied because of large sample size selected for the study.

Using sample size, a similar study strategy was adopted so as to determine the ideal sample size of the study. The study took into account critical considerations of the related studies equivalent to the current study. This was obtained by reviewing the existing literature and the various methodologies adopted in previous but related studies. This was done in order to get an insight on typical sample sizes used in the previous studies. This compelled the researcher to use similar or equivalent sample size strategy for the current study. Thus, the sample size used is valid and is replicated in the current study (Bartlett *et al.*, 2001).

The published tables' formula strategy is also used in determining the sample size of the study. The researcher relied on the published tables to determine the sample size for the current study. Although tables can provide a successful guide for determining the sample size, one may need to calculate the necessary sample size for a different combination of levels of precision, confidence and variability.

In this study, SMEs selected for the study are those SMEs which are in the definition of Kenyan SMEs context. In addition, the sample size was calculated scientifically to ensure representativeness and generalisation of the results to the population. The sample size of the study was determined by the following formula.

$$n = \frac{t^2 \times p(1-p)}{m^2}$$

Where

n= required sample size

t=confidence level at 95 percent (Standard value of 1.96)

p= estimated prevalence of the present population (50percent)

m= margin of error at 5 percent (standard value of 0.05) desired level of precision

Therefore, the sample size of this study was determined by

$$\begin{aligned} n &= \frac{1.96^2 \times 0.5(1-0.5)}{0.05^2} \\ &= 384 \end{aligned}$$

In addition to the formula used in determining the sample size of the study, this study also took into consideration the sample size of the previous related studies conducted on ICTs adoption by SMEs in both developed and developing countries to get an insight into the sample size used by previous scholars. In the literature, previous scholars have used the same sample size in their studies (Harindranath, Dyerson, and Barnes, 2008; Chiware and Dick 2008; Migiro, 2005; MacGregor, 2004).

#### **4.4 Reliability and validity of data**

The reliability of the research results was ensured through use of multiple strategies (Mitchell, 1996). First, a pre-test of the research instrument was conducted to the SMEs owners/managers who were randomly selected to ensure that irrelevant questions were eliminated from the survey instrument. This was to enhance the degree of content validity. The comments and suggestions were incorporated in the instrument before its final administration to the sampled respondents. Second, *Cronbach's alpha* coefficients were used to ensure internal consistency of the responses. By the use of SPSS (Statistical Package for the Social Sciences) technique, the Cronbach's alpha coefficient of each item in the respective constructs was determined. Thirdly, data sources were triangulated.

Validity and reliability of the constructs were tested to ensure that the measurements were accurate. Validity refers to how accurately the construct reflects what it intends to measure (Ramdani *et al.*, 2009) while reliability refers to the consistency of the results obtained. Further, construct validity is defined as the extent to which operationalisation measures the concept which it purports to measure (Ghauri and Gronhaug, 2005). There are two ways to assess construct validity namely by face validity and convergent validity.

##### **4.4.1 Face validity**

Face validity means that the measurements should be reasonable to measure what they purport to measure. Thus the simple test for face validity is to seek opinion of others who are acquainted with the topic under investigated (Ghauri and Gronhaug, 2005: 83; Ramdani *et al.*, 2009). In this study, face validity was ensured by consulting experts on the topic and pilot testing of the survey instrument to SMEs owners/managers before conducting the main study. In addition, this ensured that irrelevant questions in the survey instrument were corrected or eliminated before final distribution of the questionnaire.

#### **4.4.2 Convergent Validity**

Convergent validity explains in detail the extent to which the measurements that are used ensures that the same construct yields similar or comparable results. To achieve convergent validity in the study, the *Cronbach's Alpha* Coefficient was used. The Reliability tests of the constructs were assessed using *Cronbach's Alpha*.

#### **4.5 Data Analysis**

In this study descriptive statistics were used to analyse data. Quantitative primary data was collected by the survey questionnaire. The quantitative data was edited to eliminate any inconsistencies and later, all items were coded and treated with SPSS 17.0 (Statistical Package for Social Sciences) software for analysis. Furthermore, quantitative data after being treated with SPSS for analysis were then cross-tabulated and transferred into frequencies and percentages for ease interpretation. In addition to frequencies and percentages approaches, factor analysis; regression, inter-item correlation and Analysis of Variance (ANOVA) were applied to analyse the data.

The qualitative data was obtained by critically reviewing existing literature on SMEs and ICTs, government documents especially literature related to policies on Information and Communication Technologies and online data which is related to ICTs adoption in SMEs. The online data base includes Emerald, peer reviewed articles and online information was used.

##### **4.5.1 Factor Analysis**

Factor analysis is the most commonly used multivariate technique of research studies especially in situations pertaining to social and behavioural sciences. This technique is applied where there is a systematic interdependence among a set of observed variables and

when the researcher is interested in finding out something more fundamental that creates commonality. This technique allowed the researcher to group variables into factors which seemed critical in this study (Sivarethinamohan, 2008). These factors included internal and external drivers of ICTs adoption and internal and external barriers of ICTs adoption by SMEs.

The exploratory principal component analysis with Varimax Rotation was used to identify the critical factors which have influenced the process of ICTs adoption by SMEs and barriers to ICTs adoption in SMEs. In addition, factor analysis used a linear approach to reduction and summation of data. Thus, factor analysis identified a set of dimensions that would not easily be observable in a large set variable. These dimensions, called factors, summarized a majority of the information in the data, whereby the identification of these factors could help identify new appropriate variables for inclusion in subsequent analytical procedures, or partially or totally replace the original variables in a subsequent analysis (Davis, 2005). The method has been used by a number of researchers in the previous studies related to the current one (Pokharel, 2005). For the study, it was a reliable tool for data analysis.

#### **4.5.2 Regression**

Linear regression was used in this study to test the relationships of the constructs in the conceptual framework of ICTs adoption by SMEs formulated by the researcher. Linear regression was used to determine whether there is a relation between two critical variables of ICTs adoption. For instance, the regression approach was used to determine whether the drivers of ICTs adoption by SMEs have influence in the adoption of ICT tools by SMEs. Similarly, regression was also used to determine whether the adoption of ICT tools by SMEs would reap more benefits.

#### **4.5.3 Analysis of Variance (ANOVA)**

Analysis of Variance was used to analyse the effect of ownership of business, age of business and its influence on the process of ICTs adoption by SMEs. This approach was purposely applied in order to identify whether ownership of sole proprietor, partnership and limited company have any influence on ICTs adoption in SMEs. In order to get an insight into ICTs adoption based on the age of business, businesses were further classified into young, middle and old. The businesses were analysed using the ANOVA to find out whether the ownership, age of a business has more influence on ICTs adoption in SMEs especially in relation to the constructs of drivers, benefits, barriers and strategies used to lessen barriers to ICTs adoption.

#### **4.6 Research Ethics**

Research ethics refers to the appropriateness of research behaviour in relations to the rights of those who become the subject of the study or are affected by the study (Saunders *et al.*, 2007). The researcher ensured that respondents' rights were protected and that they were not coerced to complete the questionnaire. Instead, respondents were requested to participate voluntarily and were given the right to seek clarifications on questions on which they had doubts.

In the data collection stage, the researcher got permission from individuals in authority (e.g. gatekeepers to the information) to get access to respondents' sites. The accessibility to respondents' sites was made easier because the researcher got an approval letter from the Ministry of Education, Department of National Council for Science and Technology (NCST). The permit given facilitated the accessibility to the site (refer to appendix, 2 and 3). In addition, the researcher also obtained an approval from provincial headquarters of the provinces selected to undertake the study (Refer to appendix 4, 5, 6, and 7).

In the interpretation stage, the researcher provided an accurate account of information based on the data collected. Falsifying, or inventing findings to meet a researcher's interest or any kind of fraudulent practices was avoided. In writing and disseminating stage, the researcher ensured that the language used or words were not biased against any persons because of gender, sexual orientation or ethnic group, disability or age (Neuman, 2000).

#### **4.7 Summary**

This chapter has provided a roadmap for the study that covers the research design used for the study. Research philosophy, research approach and research strategy have also been discussed, Research methods used to collect data have been elaborated. The main survey instrument for data collection was a questionnaire. The triangulation of research strategies has been presented. Stratified random sampling in a cross-sectional survey has also been highlighted. Reliability and validity of data have been expounded. Methods of data analysis such as descriptive statistics, factor analysis, regression and Analysis of Variance (ANOVA) have been discussed. Finally, research ethics have been addressed. Specifically, ethical issues related to respondents' rights of participation, data collection, interpretation of data, writing and dissemination of information have been discussed.

The subsequent chapter (Chapter 5) presents and analyses the empirical data of the study. The presentations of the findings in the chapter are guided by the research objectives of the study.

## CHAPTER 5

### PRESENTATION OF FINDINGS

#### 5.1 Introduction

This chapter addresses the findings of the study according to the research objectives. The data has been presented by the use of tables. Part of the data specifically focuses on the demographics of respondents and the business profiles, measurement of reliability and validity. The Chapter also considers the results of the perceptions of SMEs owners/managers on the drivers to Information Communication Technologies (ICTs). The presentation further focuses on barriers to ICTs adoption in SMEs, strategies pursued to lessen the barriers to ICTs adoption, benefits of ICTs adoption and the role of the government in supporting SMEs to adopt ICTs in their business.

#### 5.2 Demographics of Respondents and Response Rate

Four hundred and fifty (450) questionnaires were distributed to the sample of study. However, out of the questionnaires distributed, only three hundred and eighty (n=380) questionnaires were duly completed and returned. This presented a response rate of 84 percent. Of three hundred and eighty (n=380) of respondents (74 percent; n=280) were males and 26 percent (n=100) were females. The age groups of the respondents indicated that most of the respondents were in the cohort of 26-35 years, (45 percent; n=172), followed by over 36 years (31 percent; n= 118) and 18-25 years were (23 percent; n=90).

The ethnic affiliation of the respondents in the three selected regions indicated that the majority of respondents were Kikuyu (28 percent; n=106), Kisii (24 percent; n=92), Luo 89 (23 percent; n=89), Luhya (12 percent; n=44) and Kalenjin (7 percent; n=25). Similarly, the educational qualifications of the respondents showed that the majority of the respondents

were holders of Kenya Certificate of Secondary Education (KCSE) (38 percent; n=143), Diploma (26 percent; n=98) and Kenya Certificate of Primary Education (KCPE) (16 percent; n=59) and post graduate (4 percent; n=16). The business experience of the respondents indicated that the majority of respondents have been in business for a period ranging from 1-5 years (41 percent; n=157), followed by 6-10 years (40 percent; n=154) and 11-15 years category accounted for 13 percent (n=49). The results of demographics of respondents are presented in Table 5.1

**Table 5.1 Demographics of Respondents**

Item	Frequency	Percent
<b>Gender</b>		
Male	280	74
Female	100	26
<b>Total</b>	<b>380</b>	<b>100</b>
<b>Age</b>		
18-25 years	90	23
26-35 years	172	45
Over 36 years	118	31
<b>Total</b>	<b>380</b>	<b>100</b>
<b>Ethnic affiliation</b>		
Kisii	92	24
Kikuyu	106	28
Luo	89	23
Kalenjin	25	7
Luhya	44	12
Others	24	6
<b>Total</b>	<b>380</b>	<b>100</b>
<b>Academic qualification</b>		
KCPE	59	16
KCSE	143	38
Diploma	98	26
Degree	64	16
postgraduate	16	4
<b>Total</b>	<b>380</b>	<b>100</b>
<b>Experience in business</b>		
1-5 years	157	41
6-10 years	154	40
11-15 years	49	13
16-20 years	14	4
Over 20 years	6	2
<b>Total</b>	<b>380</b>	<b>100</b>

### 5.3 Business Profile

The business profile highlights the nature of the business surveyed. The profile includes ownership of the business, the sector of SMEs and the age of SMEs. A majority of the businesses surveyed had sole proprietor ownership (61 percent; n=233). This showed that

most of the businesses surveyed were owned by individuals. Partnership ownership also accounted for 28 percent (n=108) and private limited ownership accounted for 11 percent (n=39). Small and Medium Enterprises surveyed were classified into two sub-sectors. The classifications are Metal and Fabrication, and Furniture and Wood. The Furniture and Wood sector accounted for 63 percent (n=241) and Metal and Fabrication accounted for 36 percent (n=136) of SMEs surveyed. The majority of Small and Medium Enterprises surveyed were Wood and Furniture.

The age of the businesses indicated that most of the SMEs surveyed had been in operation for a period ranging from 1- 5 years (44 percent; n=166), followed by businesses which had been in operation for a period of 6-10 years, (33 percent; n=127) and those that had been in existence for 11- 15 years accounted for 14 percent (n=53). The results of business profiles of SMEs surveyed are presented in Table 5.2.

**Table 5.2 Business Profile**

<b>Item</b>	<b>Frequency</b>	<b>Percent</b>
<b>Ownership</b>		
Sole proprietor	233	61
Partnership	108	28
Private limited	39	11
<b>Total</b>	<b>380</b>	<b>100</b>
<b>Sector of business operation</b>		
Metal and Fabrication	136	36
Furniture and Wood	241	63
Others	3	1
<b>Total</b>	<b>380</b>	<b>100</b>
<b>Age of business</b>		
1-5 years	166	44
6-10years	127	33
11-15years	53	14
16-20 years	16	4
Over 21 years	18	5
<b>Total</b>	<b>380</b>	<b>100</b>

#### 5.4 Extent of ICT Readiness by Kenyan SMEs

To assess the extent of ICTs readiness by Kenyan SMEs, the following variables were investigated: the drivers of ICTs, ICT tools used and benefits of ICTs adoption by SMEs. In particular, measurement validity and reliability of the critical constructs were ascertained and this was followed by the perceptions of owners/managers about the drivers, ICTs tools used and benefits of adopting ICTs in their business.

Before examining owners/managers perceptions of drivers of ICTs adoption by SMEs, measurement validity was tested using exploratory factor analysis with principal component analysis and Varimax rotation. The individual items were selected for elimination purposes using a number of criteria namely: (i) an extraction of a two constrained factor solution, (ii) retention of a factor loading of .30 or more on a particular factor, (iii) factors greater than .30 and more were retained because they seemed critical in increasing drivers for ICTs adoption by SMEs. The final exploratory analysis produced two factors, which were labelled as internal and external drivers. These two factors explained the total variance of 61.4 percent of drivers of ICTs adoption in SMEs.

At another stage, the reliability test of the items representing the drivers of ICTs adoption by SMEs was tested using *Cronbach's Alpha*. The reliability test shows the following Cronbach's values: *External drivers*  $\alpha = .93$  and *Internal drivers*  $\alpha = .81$ . The various items measuring drivers of ICTs adoption were considered to be reliable since Cronbach's Alpha ranging from .60 to 1 are considered reasonable (Makgosa, 2006). The results of measurement validity and reliability are presented in Table 5.3.

**Table 5.3 Results of an Exploratory Factor Analysis on Drivers of ICTs adoption by SMEs**

	Factor Loading	Percent of Variance Explained	Corrected Item-Total correlation	Cronbach's Alpha if Item Deleted
<b>Factor 1: External Drivers</b>		43.5		
Pressure from Government	.92		.88	.90
Pressure from the unions	.92		.87	.90
Pressure from Trade associations	.91		.86	.90
Demands from SMEs associations	.86		.79	.91
Customers' demands	.81		.77	.92
Pressure from competitors	.60		.55	.94
<b>Factor 2: Internal Drivers</b>		17.9		
Increase sales	.79		.64	.77
Improve customer services	.78		.60	.78
Pressure from staff	.76		.58	.78
Improve relations with other business partners	.64		.59	.78
Cost reduction	.63		.54	.79
Develop new markets	.54		.45	.81
Growth of business	.51		.48	.80

**5.4.1 Perception of Owners/Managers on Drivers of ICTs Adoption by SMEs**

Descriptive statistics in the form of means and frequencies were used to find out the perceptions of owners/managers about the drivers of ICTs adoption by SMEs. The findings indicate that respondents perceived the internal drivers to be more influential on ICTs adoption than external drivers. The means for internal drivers ranged from 4.18 to 4.58 while the means of external drivers ranged from 2.87 to 3.77. In particular, the empirical findings show that improving customer service was perceived as the key internal driver of ICTs adoption in SMEs by a majority of the respondents (94 percent) with a mean score of 4.58. The second rated driver for ICTs adoption by SMEs was pressure from existing staff as supported by 92 percent of the respondents with a mean score of 4.56. The third driver was

cost reduction which was perceived by 91 percent of the respondents with an average score of 4.35 that have influenced the process of ICTs adoption by SMEs.

The external drivers were perceived to have less influence on ICTs adoption by SMEs. The three external drivers that were observed to have some influence on ICTs adoption by SMEs include pressure from competitors, pressure from SMEs association and customer demands. The results indicated that 69 percent of the respondents with a mean score of 3.77 agreed with the statement that pressure from competitors was a driving force for ICTs adoption by SMEs. However, only 47 and 44 percent of the respondents viewed pressure from SMEs association and customers demand as the driving forces for ICTs adoption by SMEs respectively. The results relating to owners/managers' perceptions of drivers of ICTs adoption by SMEs are presented in Table 5.4.

**Table 5.4 Results of Owners/Managers Perceptions of Drivers of ICTs Adoption by SMEs**

Statements	Percentages					Mean(SD)
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	
<b>Internal drivers</b>						
Improve customer service	66	28	4	1	1	4.58 (.70)
Pressure from staff	66	26	5	2	1	4.56 (.75)
Cost reduction	48	43	6	1	2	4.35 (.78)
Increase sales	69	21	7	2	1	4.53 (.83)
Improve relations with other business	42	42	10	4	2	4.18 (.91)
Growth of business	46	43	7	2	2	4.28 (.84)
Develop new markets	62	20	10	6	2	4.33 (1.0)
<b>External Drivers</b>						
Pressure from trade associations	28	12	12	26	22	2.97 (1.5)
Pressure from SMEs association	29	18	15	26	12	3.25 (1.5)
Pressure from government	25	11	12	31	21	2.87 (1.5)
Pressure from labour unions	23	13	14	29	21	2.89 (1.5)
Pressure from competitors	36	33	13	9	9	3.77 (1.3)
Customer demands	25	19	22	21	13	3.22 (1.4)

**Note:**

**1 = Strongly Disagree; 5= Strongly Agree; All percentages add to 100%**

Further, Analysis of Variance (ANOVA) was used to identify whether ownership and age of business affect the owners/managers' perceptions of the drivers of ICTs adoption by SMEs. The results presented in Table 5.5 indicate that ownership of business has a significant influence on ICTs adoption by SMEs. In particular, private limited companies are highly influenced by internal and external drivers to adopt ICTs in their business than business owned through sole proprietorship. Similarly, partnership and private limited businesses are influenced by external drivers to adopt ICTs in their business than sole proprietorship. The results on the age of business showed that old and middle aged businesses are influenced by internal drivers to adopt ICTs in their business than young businesses.

**Table 5.5 Ownership, Age of Business and Drivers to ICTs Adoption by SMEs**

Variables	Means			Total	F	Sig	Scheffe
	1	2	3				
<b>Ownership</b>							
Internal drivers	4.32	4.47	4.49	4.38	3.41	.034	3>1;2>1
External drivers	3.09	3.14	3.73	3.17	4.76	.009	3>1;3>2
<b>Age of Business</b>	<b>A</b>	<b>B</b>	<b>C</b>				
Internal drivers	4.36	4.34	4.43	4.37	.64	.53	
External drivers	2.80	3.31	3.63	3.16	15.67	.001	B>A;C>A

**Note:**

- 1 = Sole proprietor, 2= Partnership and 3=Private limited company
- A= Young, B= Middle and C=Old
- Young=Less than 5 years, Middle =6 to 10 years and Old= More than 10 years old

**5.4.2 Usage of ICT Tools**

To get insight into owners/managers' perceptions on ICT tools commonly used by SMEs in Kenya, frequencies and means were used. The majority of the respondents (89 percent) with a mean score of 4.5 perceived mobile phones as the most commonly ICTs tool used by SMEs. Personal computers were the second most preferred ICT tool by Kenyan SMEs. Personal computers were mostly used by 62 percent of the respondents (a mean score of 3.5). Findings also revealed that photocopier machines were perceived as most used by 50 percent of the respondents with a mean score of 3.2. However, less than 50 percent of respondents were of the opinion that other tools such as internet, fax, printers, scanners, website and telex were least used in their businesses. Results of the perceptions of owners/managers of ICTs tools used by SMEs are presented in Table 5.6.

**Table 5.6 ICT Tools Used by SMEs**

ICTs tools	Percentages					Mean (SD)
	Most used	Used	Sometimes used	Least used	Not used at all	
Mobile phones	79	10	3	2	6	4.5 (1.09)
Personal computers	46	16	5	9	24	3.5 (1.68)
Photocopier	38	14	12	13	23	3.2 (1.63)
Printer	37	12	6	13	32	3.1 (1.73)
Internet	40	9	5	17	29	3.1 (1.73)
Laptops	28	19	7	14	32	2.9 (1.65)
Landline telephones	29	13	9	14	35	2.8 (1.67)
Website	31	9	4	12	44	2.7 (1.77)
Typewriter	26	9	7	16	42	2.5 (1.67)
Telex	17	10	7	16	50	2.3 (1.56)
Fax	21	12	6	12	49	2.4 (1.65)
Scanner	22	9	9	14	46	2.4 (1.64)

Note: 1 = Not used at all; 5= Most used;

SMEs effects of ownership and age of business were explored using Analysis of Variance (ANOVA). The empirical results presented in Table 5.7 indicate that ownership of the business and the ages of the business both have a significant influence on ICT tools adoption by SMEs. For instance, private limited companies used all ICT tools with exception of mobile phones than sole proprietor and partnership. Nonetheless, there seemed to be no difference on the use of mobile phones among all the companies based on ownership. In addition, older businesses which have been in operation for a period of more than 10 years have used all ICT tools more than middle aged and young businesses. Middle aged businesses have used more ICT tools than young businesses. However, there is no significant difference in the use of mobile phones and laptops among old, young and middle aged businesses.

**Table 5.7 Ownership, Age of Business and ICT Tools**

Ownership	Means			Total	F	Sig	Scheffe
	1	2	3				
Laptops	2.80	2.95	4.11	2.98	10.51	.001	3>2;3>1
Fax	2.16	2.51	3.95	2.45	20.44	.001	3>2;3>1
Printer	2.76	3.30	4.51	3.11	19.70	.001	3>2; 2>1;3>1
Photocopier	2.97	3.50	4.44	3.28	15.82	.001	3>2; 2>1;3>1
Mobile Phones	4.47	4.67	4.56	4.54	1.29	.276	
Internet	2.84	3.37	4.24	3.14	12.77	.001	3>2;2>1;3>1
Website	2.63	2.58	3.89	2.74	9.39	.001	3>2; 3>1
Landline Telephone	2.67	2.98	3.86	2.88	8.64	.001	3>2; 3>1
Telex	2.14	2.30	3.51	2.33	13.02	.001	3>2;3>1
Scanner	2.26	2.50	3.63	2.48	12.07	.001	3>2; 3>1
Typewriter	2.36	2.78	3.61	2.61	10.18	.001	3>2; 3>1
Age of business	A	B	C				
Laptops	2.74	3.03	3.33	2.97	3.55	.30	
Fax	2.12	2.40	3.13	2.43	10.50	.001	C>A;C>B
Printer	2.69	3.23	3.74	3.10	10.74	.001	B>A;C>A
Photocopier	2.93	3.44	3.78	3.29	8.42	.001	C>A
Mobile Phones	4.55	4.50	4.52	4.53	.064	.938	
Internet	2.79	3.10	3.84	3.13	10.57	.001	C>A;C>B
Website	2.29	2.88	3.37	2.73	11.43	.001	C>A;B>A
Landline Telephone	2.55	2.97	3.33	2.86	6.39	.002	C>A
Telex	1.94	2.34	3.03	2.31	13.41	.001	C>A;C>B
Scanner	2.10	2.51	3.19	2.48	12.58	.001	C>A;C>B
Typewriter	2.03	2.83	3.35	2.59	20.77	.001	C>A;B>A

Note:

- 1= Sole proprietor, 2= Partnership and 3=Private limited company
- Young=Less than 5 years, Middle =6 to 10 years and Old= More than 10 years old
- A= Young, B= Middle and C=Old

### 5.4.3 Benefits of ICTs Adoption by SMEs

In order to identify the benefits of ICTs adoption by SMEs, the validity and reliability of the items used to measure the benefits of ICTs were first tested using inter-item correlation and Cronbach's Alpha. The results of inter –item correlation and reliability analysis presented in Table 5.8 revealed an Alpha value of  $\alpha=91$ . An investigation of reliability scores reflected that deletion of items did not improve the scale reliability. Hence, the Cronbach's Alpha

ranging from .60 to 1 was considered reasonable and that the various items used are reliable (Makgosa, 2006; Migiro, 2005).

**Table 5.8 Results of Inter-Item Correlation on the Benefits of ICTs Adoption by SMEs (Cronbach's Alpha=.91)**

Items	Corrected Item-Total correlation	Cronbach's Alpha if item deleted
Accessibility to international markets	0.32	0.92
Enhance market intelligence gathering	0.52	0.91
Facilitation of quick flow of information Internal and externally	0.53	0.91
Increased productivity in business	0.45	0.91
Reduced operation costs in running business	0.45	0.91
Link to local & global supply chain &outsourcing opportunities	0.54	0.91
Encouragement of inter-intra business transactions.	0.59	0.91
Improvement of information and knowledge management	0.56	0.91
Sharing and learning of new business practices	0.47	0.91
Compliance with government requirements.	0.54	0.91
Increased efficiency	0.52	0.91
Facilitation of payments to third parties	0.43	0.91
Enhancing the company image	0.53	0.91
Reduced cost of communication	0.63	0.91
Achievement of more customer satisfaction	0.52	0.91
Monitoring the performance of competitors	0.54	0.91
Reduction of overall workload of employees	0.65	0.91
Monitoring of quality control systems	0.68	0.91
Decreases in sales staff travel time	0.62	0.91
Flexibility/adaptability of organisational activities	0.63	0.91
Improved labour/employee relations	0.57	0.91
Gain competitive advantage	0.61	0.91
Increase returns on investment	0.50	0.91

**Note:** 1=Strongly Disagree; 5=Strongly Agree,

Secondly, means and frequencies were used to access owners/managers' perceptions about the benefits of ICTs adoption by SMEs. The findings presented in Table 5.9 indicate that

SMEs which have adopted ICTs in their business processes enjoy numerous benefits. The means ranged from 3.8 to 4.5. Means lower than 4 (agree) were scored for a few of the benefits observed. These included reduced cost of communication, flexibility of organisational activities, monitoring of quality control systems, reduced workload of staff and decrease in sales staff travel time. However, the five highly rated benefits of ICTs adoption by SMEs included increased productivity in business, facilitation of quick flow of information, accessibility to international markets, enhancing market intelligence gathering and linking to local/global supply chains and improving knowledge management.

Of particular note is the fact that 92 percent of the respondents (a mean score of 4.4) agreed that ICTs adoption by SMEs would lead to facilitation of a quick flow of information in their business. This would enable SMEs owners/managers to make quick and informed decisions of the business in the era of competition. In addition, 91 percent of respondents with a mean score of 4.5 perceived increased productivity of the business as an important benefit of ICTs adoption in SMEs. One of the benefits, 'to enhance market intelligence gathering information', was supported by 90 percent of the respondents with a mean score of 4.3. The data implies that ICTs adoption helps businesses by availing necessary information to SMEs owners/managers to enable them to make critical decisions especially in pricing of their products and monitoring the competitors. Improvement of information and knowledge management and linking to local/and global supply chains /outsourcing were considered as some of the benefits of ICTs adoption in SMEs and were supported by 89 percent and 88 percent of respondents respectively.

**Table 5.9 Results of Perceptions of Owners/Managers on Benefits of ICTs by SMEs**

Statements	Percentages					Mean(SD)
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	
Increased productivity in business	59	32	6	2	1	4.5 (.75)
Facilitation of quick flow of information	54	38	5	1	2	4.4 (.77)
Accessibility to international markets	63	25	4	4	4	4.4 (1.0)
Enhance current market intelligence gathering	53	37	5	3	2	4.3 (.86)
Improvement of information and knowledge management	48	41	7	2	2	4.3 (.83)
Link to local and global supply chains/outourcing	52	36	7	3	2	4.3 (.88)
Increase returns on investment	57	28	9	3	3	4.3 (1.0)
Sharing and learning of information of new business	52	35	8	3	2	4.3 (.86)
Facilitation of payments to third parties	52	27	13	7	1	4.2 (.99)
Achievement of more customer satisfaction	45	40	10	3	2	4.2 (.87)
Gain competitive advantage	42	44	7	5	2	4.2 (.93)
Reduced operation costs in running the business	45	27	20	5	3	4.1 (1.1)
Encouragement of inter-intra business transactions	38	45	9	6	2	4.1 (.95)
Compliance with government requirement, business registration and tax returns	41	36	16	5	2	4.1 (.95)
Monitoring performance of competitors	39	40	14	5	2	4.1 (.94)
Increased efficiency	50	25	22	3	0	4.1 (.91)
Enhancing the company image	37	41	11	5	6	4.0 (1.1)
Improved labour/employees relations	40	39	10	6	5	4.0 (1.1)
Reduced cost of communication	40	27	23	6	3	3.9 (1.1)
Flexibility of organizational activities	36	32	20	10	2	3.9 (1.1)
Monitoring of quality control systems	36	34	21	5	4	3.9 (1.1)
Reduction of overall workload of employees	34	25	30	7	4	3.8 (1.1)
Decreases in sales staff travel time	35	26	24	10	5	3.8 (1.2)

**Note: 1 = Strongly Disagree; 5= Strongly Agree**

To get further insight into the benefits of ICTs adoption by SMEs, ANOVA was used mainly to test whether ownership and age of business affect the benefits. The empirical results presented in Table 5.10 indicate that ownership of business has a significant influence on the benefits of ICTs adoption by SMEs ( $F=5.79$ ,  $P=.003$ ). Specifically, private limited businesses (Mean=4.43) and partnership (Mean=4.17) which have adopted ICTs in their business reap more benefits of ICTs adoption than sole proprietors (Mean=4.09). However, age of business did not have any significant influence on the benefits of ICTs adoption by SMEs.

**Table 5.10 Ownership, age of business and effect on the benefits of ICTs adoption by SMEs**

Ownership	Means			Total	F	Sig	Scheffe
	1	2	3				
Benefits	4.09	4.17	4.43	4.14	5.79	.003	3>1
Age of Business	A	B	C				
Benefits	4.10	4.14	4.23	4.15	1.37	.25	

**Note:**

- **Young**=Less than 5 years, **Middle** =6 to 10 years and **Old**= More than 10 years old
- **1**= Sole proprietor, **2**= Partnership and **3**=Private limited company
- **A**= Young, **B**= Middle and **C**=Old

### 5.5 Barriers to ICTs Adoption by Kenyan SMEs

SMEs face many challenges which impede the process of ICTs adoption. To identify barriers of ICTs adoption by SMEs, barriers to ICTs adoption were analysed and tested by using exploratory factor analysis with Varimax rotation. The exploratory factor analysis results are presented in Table 5.11. To identify the meaningful factors which have negatively affected the process of ICTs adoption by SMEs, individual items were selected for elimination using a number of criteria namely, (i) a constraint of two factor solution was extracted, (ii) factor loading of .30 or more on a particular factor was used, (iii) only factors greater than .30 and more were retained because they are good indicators of barriers to ICTs adoption by SMEs.

The final output generated two factors with total variance of 64.8 percent. The total values of variance indicated that items measuring internal and external barriers were critical factors to have inhibited the process of ICTs adoption by SMEs.

A reliability test of the items representing the barriers to ICTs adoption in SMEs was tested using *Cronbach's* alpha. Thus, the reliability test showed the following *Cronbach's* values: *Internal barriers:  $\alpha=.94$*  and *external barriers:  $\alpha=.81$* . Hence, the *Cronbach's* alpha values ranging from .60 to 1 are considered reasonable (Makgosa, 2006).

**Table 5.11 Results of an Exploratory Factor Analysis on Barriers to ICTs Adoption in SMEs**

Item	Factor Loading	Percent of Variance	Corrected Item-Total Correlation	Cronbach's if Item Deleted
<b>Factor 1: Internal barriers</b>		52.3		
Owner/manager's unawareness of the benefits of ICTs	.87		.83	.93
Resistance to change (old way working)	.86		.81	.94
Not sure what ICT tool to adopt	.86		.81	.94
Lack of security in the use of ICTs	.85		.82	.94
ICTs do not satisfy the needs of business	.83		.79	.94
Lack of information on the benefits of adopting ICT tools.	.82		.77	.94
Lack of ICTs legal framework	.78		.76	.93
Staff not understanding the use of ICTs	.73		.73	.94
Lack of defined strategy to encourage ICTs adoption	.73		.71	.94
Frequent power failure/interruptions	.67		.63	.94
Difficulty in employing qualified personnel	.59		.58	.94
High cost of training of employees	.58		.57	.94
<b>Factor 2: External Barriers</b>		12.5		
High cost of internet connectivity	.86		.76	.62
High cost of ICTs	.84		.58	.81
Slow internet connection	.80		.65	.75

Further, means and frequencies were used to identify the key barriers of ICTs adoption among Kenyan SMEs. The empirical results of the barriers presented in Table 5.12 show that

all the external barriers to ICTs adoption by SMEs are more influential in the adoption of ICTs in SMEs than internal barriers. In particular, results indicate that most of the respondents (90 percent) rated high costs of ICTs as one of the major external barriers to ICTs adoption by SMEs (Mean=4.5). The second external barrier to ICTs adoption by SMEs rated was the high cost of internet connection. 85 percent of the respondents agreed with the statement (mean score=4.2).

The third ranked external barrier to ICTs adoption by SMEs was slow internet connection where 74 percent of the respondents agreed with the statement with a mean score of 3.9. However, when considering the means, the findings show that respondents did not perceive internal barriers as the most influential in ICTs adoption in SMEs. The means of internal barriers ranged from 2.8 to 3.7. Three internal barriers that were perceived as somewhat influential in ICTs adoption by more than 50 percent of the respondents were difficulty in employing qualified personnel (64 percent), high cost of training employees (67 percent), and lack of a defined strategy for ICTs adoption (53 percent).

**Table 5.12 Results on Perception of Owners/Managers' of Barriers to ICTs Adoption by SMEs**

Statements	Percentages					Mean(SD)
	Very High	High	Moderate	Low	Very Low	
<b>External Barriers</b>						
High costs of ICTs	64	26	6	2	2	4.5 (.85)
High cost of internet connection	44	41	6	5	4	4.2 (1.0)
Slow internet connection	39	35	14	7	5	3.9 (1.1)
<b>Internal Barriers</b>						
Difficulty in employing qualified personnel	33	31	17	14	5	3.7 (1.2)
Lack of defined strategy to encourage ICTs adoption	30	23	21	19	7	3.5 (1.3)
Frequent power failure/interruptions	28	18	34	13	7	3.5 (1.2)
Staff not understanding the use of ICTs	35	17	14	22	12	3.4 (1.6)
Lack of security in the use of ICTs	32	21	11	10	26	3.2 (1.6)
Lack of SMEs ICTs legal framework	28	20	16	16	20	3.2 (1.5)
Owner/managers unawareness of benefits of ICTs	27	22	11	12	28	3.1 (1.6)
ICTs do not satisfy the needs of the business	28	18	11	15	28	3.0 (1.6)
Not sure ICTs tools to adopt	24	15	12	13	36	2.8 (1.6)
Resistance to change (old way of doing things)	30	16	10	14	30	3.0 (1.7)
High cost of training employees	36	31	11	14	8	3.7 (1.3)
Lack of information on the benefits of adopting ICTs	33	17	12	24	14	3.3 (1.5)

**Note: 1 = Very Low; 5= Very High**

In addition, ANOVA was used to further understand barriers of ICTs adoption by SMEs. The results in Table 5.13 indicate that ownership of business had a significant influence on the barriers to ICTs adoption by SMEs. For instance, results show that companies that were private limited and partnerships tend to experience more of the influences of external barriers to ICTs adoption more than sole proprietors. In addition, private limited companies perceive internal barriers to be more influential than partnerships and sole proprietorship ownership. However, the age of the business tends to be related to and affected by internal barriers. In particular, both old and middle aged businesses perceive internal barriers to be high than

young businesses. Furthermore, old businesses perceived internal barriers to be more influential than middle-aged business.

**Table 5.13 Ownership, Age of Business and Barriers of ICTs adoption by SMEs**

Barriers	Means			Total	F	Sig	Scheffe
	1	2	3				
External barriers	4.09	4.35	4.37	4.20	4.02	.019	3>1;2>1
Internal barriers	3.19	3.37	3.82	3.31	5.34	.005	3>1;2>1
Age of business	A	B	C				
Internal barriers	3.12	3.29	3.63	3.29	5.71	.004	C>A
External barriers	4.27	4.14	4.13	4.19	1.10	.33	

**Note:**

- Young=Less than 5 years, Middle =6 to 10 years and Old= More than 10 years old
- 1 = Sole proprietor, 2= Partnership and 3=Private limited company
- A= Young, B= Middle and C=Old

**5.6 Strategies Used to Lessen the Barriers to ICTs Adoption by Kenyan SMEs**

Barriers to ICTs adoption need to be addressed in order to increase chances of ICTs adoption in SMEs. To identify the appropriate strategies to be used by SMEs to lessen barriers to ICTs adoption, the first measurement of reliability and validity on strategies was done using inter-item correlation. Secondly, the results on strategies used to lessen the barriers to ICTs adoption by SMEs were analysed by means and frequencies.

The inter-item correlation analysis and reliability test were conducted to assess the validity and reliability of the items in the overall scale. The results of inter-item correlation and reliability analysis are shown in Table 5.14. Furthermore, reliability test of the items representing the strategies to lessen barriers of ICTs adoption by SMEs was done using Cronbach’s Alpha. The reliability test shows the following Cronbach’s value of the strategies  $\alpha=.77$ . Thus, the Cronbach’s Alpha ranging from .60 to 1 is considered reasonable and therefore, the various items used in the instrument were found to be reliable.

**Table 5.14: Results on Inter-item Correlation and Reliability on Strategies to Lessen Barriers to ICTs Adoption by SMEs.**

Item	Corrected Total correlation	Item-Cronbach's Alpha if item deleted
Human capital development	0.39	0.76
Reduce cost of internet connection	0.42	0.76
Addressing security issues on use of ICTs tools	0.32	0.77
Improve internet connectivity (speed)	0.53	0.74
Increase access to credit (from government, banks)	0.52	0.75
Use of alternate power sources	0.47	0.75
Enabling ICT policy (Regulatory framework)	0.44	0.76
Liberalisation of telecommunication sector	0.55	0.74
Collaborative use of ICTs	0.51	0.75

The results of the strategies to lessen the barriers to ICTs adoption by SMEs (presented in Table 5.15) show that human capital development was rated high by 94 percent of the respondents (mean score = 4.6). This is an important strategy in resolving the barriers to ICTs adoption in SMEs. This would go a long way in addressing the issue of lack of manpower with ICTs-related skills both in the short and the long-term.

Reduction of cost of internet connection was rated by 91 percent of the respondents as one of the critical strategies to lessen the barriers to ICTs adoption in SMEs (a mean score of 4.5). SMEs have failed in ICTs adoption in their business because of the cost of internet connection which is very high and beyond the affordability of SMEs. Most of the respondents felt that the reduction of internet connection costs would increase chances of ICTs adoption in SMEs. The third strategy rated by 88 percent of the respondents with a mean score of 4.4 was improvement of internet connectivity.

Increasing credit facilities to SMEs was rated as a fourth strategy in resolving barriers to ICTs adoption in SMEs by 87 percent of the respondents with a mean score of Mean= 4.4.

This strategy would address issues of lack of financial resources to buy modern ICTs and other issues related to training employees and difficulty in employee attraction and retention.

Collaborative approach in the use of ICTs by SMEs in their business was rated as the fifth strategy in lessening the barriers to ICTs adoption by SMEs. This was rated by 78 percent of the respondents (mean score= 4.2). This strategy would address the barrier related to lack of finance to buy ICTs.

Addressing security issues on the usage of ICTs was rated by 78 percent of the respondents with a mean score of 4.2. Addressing security issues was seen as lessening barriers to ICTs adoption by SMEs. Nevertheless, a majority of SMEs owners/managers have not adopted ICTs in their business processes because they felt that ICTs cannot be trusted in making online payments. Most respondents felt that if the problem of security in using ICTs is addressed there would be high chances of ICTs adoption by SMEs.

**Table 5.15 Results on Perception of Owner/ Managers' on Strategies to Resolve Barriers to ICTs Adoption by SMEs**

Statement	Percentages					Mean(SD)
	Very important	Important	Least important	Not important	Not important at all	
Human capital development	71	23	4	1	1	4.6 (.71)
Reduce cost of internet	62	29	6	2	1	4.5 (.79)
Improve internet connectivity	54	34	8	2	2	4.4 (.86)
Increase access to credit	59	28	9	2	2	4.4 (.84)
Addressing security issues on ICTs	50	28	19	2	1	4.2 (.91)
Collaborative use of ICTs	54	24	11	5	6	4.2 (1.2)
Use of alternate power sources	34	41	18	5	2	4.0 (.95)
Liberalization of telecommunication sector	31	45	12	7	5	3.9 (1.1)
Enabling ICTs policy	31	34	22	9	4	3.8 (1.1)

Note: 1 = Not Important At All; 5= Very Important

To get a holistic view on the strategies to be used to lessen the barriers to ICTs adoption by SMEs, the ANOVA was done and the results are presented in Table 5.16. The results demonstrated that ownership of the business had a significant influence on the strategies to be used to lessen the barriers to ICTs adoption by SMEs. Private limited companies and partnerships are better placed to put in place various strategies to lessen barriers to ICTs adoption compared to sole proprietorship. However, the age of the business did not have any significant influence on the strategies used to lessen the barriers to ICTs adoption by SMEs.

**Table 5.16 Ownership and Age of Business and Strategies to ICTs adoption by SMEs**

Variables	Means			Total	F	Sig	Scheffe
	1	2	3				
Ownership Strategies	4.15	4.25	4.43	4.21	4.29	.01	3>1
Age of business Strategies	A 4.25	B 4.13	C 4.24	4.21	1.8	.17	

**Note:**

- 1= Sole proprietor, 2= Partnership and 3=Private limited company

**5.7 The Role of Government in Promoting the Use of ICTs by SMEs**

SMEs need to be supported by the government to adopt ICTs in their businesses in this era of competition. The results of the objective on the role of the government support in ICTs adoption by SMEs in their business processes are presented in Table 5.17. The majority of the respondents, 91 percent (a mean score = 4.58), pointed out that the government should support SMEs in terms of giving grants/subsidies and consultancy. These forms of assistance will enable SMEs to buy ICT tools and develop manpower in ICTs related skills.

The second role the government could play in assisting SMEs is providing information on the benefits of ICTs adoption in their business. This form of assistance was supported by 88 percent of the respondents (mean score = 4.48). Providing information about the benefits of ICTs adoption would enable SMEs owners/managers to appreciate the importance of ICTs adoption in their business. In addition, owners/managers would be in a position to understand the challenges faced by SMEs in ICTs adoption in their business.

ICTs training policy was considered as another important role the government could play in supporting SMEs to adopt ICTs. This was supported by 64 percent of the respondents (mean score = 3.95). This role by government would alleviate the shortage of manpower related to

ICTs skills and ensure that there are enough personnel available in the labour market with relevant ICTs skills.

**Table 5.17 Role of Government Support to SMEs**

Statement	Percentages					Mean(SD)
	Most useful	Useful	Sometimes useful	Least useful	Not useful at all	
Government supports by grants/subsidies/consultancy	69	22	8	1	0	4.58 (.71)
Government provides information on benefits of ICTs	63	25	12	0	0	4.48 (.78)
ICTs training policy	40	24	29	6	1	3.95 (1.0)
There exist government policy on ICTs adoption in SMEs	34	29	31	4	2	3.89 (.99)
There is a national ICTs policy	28	23	17	24	8	3.38 (1.3)

**Note:** 1 =Not useful at all; 5= Most useful

### 5.8 Testing of Proposed Conceptual Framework Model on ICTs Adoption by SMEs

The analysis relating to testing of the conceptual framework proposed was carried out in two phases. First, a series of linear regression was used to determine whether the usage of ICT tools is influenced by the drivers and barriers to ICTs adoption by SMEs. The results of multiple regression analysis (Table 5.18), reveal that external drivers such as pressure from trade unions, SMEs associations, government, labour unions and customers influence have a positive and significant effect on the use of the following ICT tools: personal computers, printers, photocopiers, internet, website, landline telephone, telex and typewriters. However, external drivers have a negative significant influence on the use of mobile phones and laptops. This means that there is a significant low use of mobile phones and laptops when external drivers increase.

On the other hand, internal drivers were found to have a positive and significant influence only on the use of mobile phones and laptops. Internal drivers have non-significant influence

on other ICT tools such as the use of laptops, printers, photocopiers, internet, website, telephones, scanners and typewriters. However, the use of personal computers and telex showed negative and significant effects of internal drivers. These findings suggest that when internal drivers such as cost reduction, pressure from staff, need for improved customer service and sales are perceived high, there is a high level use of mobile phones and laptops while the adoption of other tools is not highly influenced by internal drivers. Moreover, internal drivers have low influence on the use of personal computers and telex.

Internal barriers have a positive and significant influence on the use of personal computers, printers, photocopiers, internet, landline telephones, telex, scanners and typewriters. Findings indicate that the use of these tools increases when the internal barriers are perceived to be highly influential. However, internal barriers did not influence the use of mobile phones significantly. Similarly, external barriers had a positive and significant effect on the use of personal computers, laptops, photocopiers, mobile phones, internet, website and telephones. Nonetheless, the use of scanners, typewriters and telex was not overly influenced by external barriers.

**Table 5.18: Regression Results on the Impact of Drivers and Barriers on Usage of ICT Tools by SMEs**

Model	Unstandardized Coefficients (B)	t	Significant
<b>Use Personal computers</b>			
External drivers	.266	2.71	.007
Internal drivers	-.213	-1.32	.187
Internal barriers	.259	2.47	.014
External barriers	.346	3.18	.002
<b>Use of laptops</b>			
External drivers	-.247	2.41	.016
Internal drivers	-.229	-1.37	.171
Internal barriers	-.021	-.187	.851
External barriers	.419	3.69	.001
<b>Use of printers</b>			
External drivers	.299	3.198	.002
Internal drivers	-.032	-.209	.834
Internal barriers	.516	5.14	.001
External barriers	.112	1.08	.277
<b>Use of photocopiers</b>			
External drivers	.284	3.11	.002
Internal drivers	.171	1.14	.251
Internal barriers	.337	3.46	.001
External barriers	.197	1.95	.052
<b>Use of mobile phones</b>			
External drivers	-.130	-1.94	.053
Internal drivers	.364	3.31	.001
Internal barriers	.060	.83	.406
External barriers	.177	2.38	.018
<b>Use of internet</b>			
External drivers	.268	2.75	.006
Internal drivers	-.084	-.52	.602
Internal barriers	.384	3.65	.001
External barriers	.265	2.48	.013
<b>Use of website</b>			
External drivers	.409	4.04	.001
Internal drivers	-.257	-1.54	.123
Internal barriers	.294	2.71	.007
External barriers	.188	1.66	.096
<b>Use of landline telephones</b>			
External drivers	.229	2.31	.021
Internal drivers	.055	.338	.735
Internal barriers	.223	2.11	.036
External barriers	.248	2.26	.024
<b>Use of telex</b>			

External drivers	.448	5.32	.001
Internal drivers	-.259	-1.87	.061
Internal barriers	.359	3.98	.001
External barriers	.136	1.45	.147
<b>Use of scanner</b>			
External drivers	.193	1.99	.047
Internal drivers	-.183	-1.15	.251
Internal barriers	.368	3.54	.001
External barriers	.120	1.11	.265
<b>Use of typewriter</b>			
External drivers	.473	5.17	.001
Internal drivers	-.054	-.35	.720
Internal barriers	.292	2.99	.003
External barriers	.126	1.24	.215

The results on the usage of ICTs and the benefits to be realised by SMEs are presented in Table 5.19. The results indicate that the use of printers, mobile phones, telex and typewriters had a significant and positive effect on benefits of ICTs adoption. This suggests that the high level of adoption of printers, mobile phones, telex and typewriter increases the choice of enjoying benefits of ICTs adoption. However, the use of personal computers, laptops, website and landlines did not lead to the realisation of benefits associated with ICTs adoption. In addition, the use of scanners negatively influences the realisation of benefits. Thus, the high level of use of scanners reduces the choices of enjoying the benefits of ICTs adoption by SMEs.

**Table 5.19: Regression Results on the Impact of Usage of ICT Tools on Benefits**

Benefits	Unstandardized Coefficients B	t	Significant
Use of personal computers	0.18	.722	.471
Use of laptops	-.040	-1.59	.113
Use of fax	-.039	-1.35	.178
Use of printers	.076	2.31	.022
Use of photocopier	.050	1.72	.086
Use of mobile phones	.109	3.95	.001
Use of internet	.026	.970	.333
Use website	.029	1.14	.257
Use Landline telephones	-.022	-.876	.382
Use of telex	.079	2.56	.011
Use of scanner	-.058	-2.00	.046
Use of typewriter	.044	1.74	.084

### 5.9 Summary

The chapter has presented the measurements for reliability and validity of the variables investigated. Similarly, the chapter has also discussed the findings of the study in relation to the objectives of the study. Specifically, it has focused on the drivers to ICTs adoption whereby two critical factors were identified to have influenced the process of ICTs adoption by SMEs. These two factors are the internal and external factors. For instance, pressure from the competitors is an external factor while increasing sales is an internal factor which has been considered to have highly influenced the process of ICTs adoption by SMEs. Barriers to ICTs adoption by SMEs have also been discussed. Internal and external barriers to ICTs adoption have been identified and discussed. Strategies to lessen these barriers to ICTs adoption have been expounded. For instance, human capital development has been considered as one of the appropriate strategies to lessen the barriers to ICTs adoption by SMEs. Benefits of adopting ICTs by SMEs have been discussed. For example, facilitation of quick flow of information is one of the benefits SMEs would gain in adopting ICTs in their business processes. The role of the government in supporting SMEs has been explained.

Providing subsidies/grants and tax holidays were perceived by SMEs owners/managers as one of the ways of encouraging SMEs to adopt ICTs in their business processes.

The following chapter (Chapter 6) discusses the findings of the study. The research objectives are explained in relation to the findings and supported by the literature review.

## CHAPTER 6

### DISCUSSION OF FINDINGS

#### 6.1 Introduction

This chapter discusses the research objectives of the study. The chapter also discusses the findings of the research objectives in relation to the literature review presented in chapter 3. The research objectives of the study were: to explore ICTs adoption readiness in Kenyan SMEs; investigate barriers to ICTs adoption by SMEs; identify strategies pursued to lessen the barriers of ICTs adoption by SMEs and increase chances of ICTs adoption by SMEs. The role of government in supporting SMEs to adopt ICTs in their businesses and finally, testing the relationships of the constructs of the proposed conceptual framework in the study.

#### 6.2 Demographics of Respondents

The empirical results indicated that most of the businesses surveyed were owned and managed by males. The males accounted for 74 percent of the respondents compared to their female counterparts who accounted for 26 percent (see chapter 5, Table 5.1). The sub-sectors of SMEs surveyed were categorised into metal and fabrication, and furniture and wood. The nature of the businesses tends to be driven by males. From the findings, however, it is indicated that females are also venturing into these businesses because of high level employment.

The majority of the respondents in the age range of 26-35 years accounted for 172 (45 percent). This demonstrated the fact that most of the respondents have taken risks and ventured into entrepreneurship by starting and operating their own business either in furniture and wood or metal and fabrication. In terms of educational qualification of the respondents,

the study showed that most of the respondents had a Kenya Certificate Secondary Examination (KCSE) which accounted for 143 (38 percent). This showed that the respondents have an idea of what ICTs tool is and have either used one or more of these ICTs in their business. Therefore, the respondents understood the usage of ICT tools in their business.

The majority of the respondents consented that most of the SMEs surveyed were SMEs that were owned and managed by Kikuyu and Kisii who accounted for 28 percent (106) and 24 percent (92) respectively as presented in chapter 5 (Table 5.1). Similarly, most of the respondents had some business experience ranging from 1 year to 5 years (41 percent; n=157). This clearly demonstrated that SMEs surveyed were owned and managed by owners/managers with experience and therefore, they are aware of ICTs in their businesses.

### **6.3 Business Profile**

The majority of the respondents agreed that SMEs surveyed were sole proprietor-owned as supported by 61 percent (233), as presented in chapter 5 (Table 5.2). This demonstrated that most SMEs owners/managers preferred to own and manage business on sole proprietor ownership because they are motivated by profits. Sole proprietorship ownership has some disadvantages: sole proprietor ownership has unlimited liabilities and to minimise these, some, SMEs are owned as limited companies. Some of the SMEs, 61 percent (n=108), were owned on partnerships. This was done purposely done to minimise demerits experienced by sole proprietorship ownership.

The businesses surveyed had been in operation for a period ranging from 1-5 years, (44 percent; n=166). This indicated that SMEs investigated in the study had used one or more ICTs in their business. Therefore, the respondents were in a position to give a true picture on ICTs adoption by SMEs.

#### 6.4 Drivers of ICTs Adoption by SMEs

The empirical results of drivers of ICTs adoption by SMEs demonstrated that SMEs adopt ICTs in their businesses because of external and internal drivers (see in chapter 5, Table 5.4). The external drivers are those factors which influence ICTs adoption by SMEs from outside the business. For instance, pressure from competitors was rated as one of the drivers which had influenced SMEs to adopt ICTs in their business as supported by 69 percent of the respondents. Generally, as noted in Chapter 3 (Section 3.2.1) and the empirical finding in Chapter 5 (Table 5.4), it is shown that SMEs in Kenya have adopted ICTs in their business processes because of pressure from their competitors. This finding is similar to Pavic *et al.*, (2007) who pointed out that SMEs have adopted ICTs in their businesses in order to respond quickly to pressures from competitors. In addition, Vrazalic *et al.*, (2002) argued that SMEs are driven to adopt ICTs in their business by pressure from competitors and suppliers, development of new markets and improvement of business with other business partners in the business environment.

The finding on drivers of ICT adoption was echoed by Kaynak *et al.*, (2005) who point out that most SMEs are influenced to adopt ICTs in their businesses processes because of pressure from customer's expectations and competitors. Furthermore, SMEs adopt ICTs in their business to counter the pressure from their competitors. Generally, competition leads to provision of quality products or service delivery at a cheaper price. The adoption of ICTs by SMEs will lead to reduction of operational costs, improve their customer relations, encourage faster communication in the organisation and develop new markets. This will go along in countering the pressure from competitors and in the long run would have a positive impact on profits.

SMEs have also been influenced to adopt ICTs in their business because of pressure from SMEs associations as supported by 47 percent of the respondents (Table 5.4). The result is

consistent with Pavic *et al.*, (2007) who posit that SMEs have adopted ICTs in their business because of pressure from SMEs associations. SMEs associations have influenced SMEs to adopt ICTs in their business in order to remain strategically competitive in the era of globalisation. Thus, there are many potential benefits of ICTs adoption by SMEs. For instance, ICTs adoption in SMEs will assist SMEs to access to international markets to sell their products.

SMEs have been influenced too to adopt ICTs in their business because of customer demands. This was rated by 44 percent of the respondents (see chapter 5, Table 5.4). Customers demand to be served better and faster. This finding is similar to Sharma and Bhagwat, (2006); Moriones and Lopez (2007); Nguyen, (2009) and Ashrafi and Murtaz (2008) who all assert that SMEs have adopted ICTs in their business because of pressure from their customers who are demanding quality services.

Internal drivers have also influenced the process of ICTs adoption by SMEs. The empirical findings indicated that 94 percent of the respondents rated improvement in customer services as one of key drivers of ICTs adoption by SMEs (Chapter 5, Table 5.4). The observations noted previously in Chapter 3 (Section 3.2.2) indicate that the Kenyan SMEs have adopted ICTs in the business to improve customer services. These findings are consistent with previous researchers (Chiwere and Dick, 2008; Henry-Crawford, 2003) who pointed out that SMEs adopt ICTs in their business processes to improve customer service. In addition, this makes SMEs to remain competitive and also enhances the degree of customers' retention in business.

Pressure from the existing staff of SMEs was rated as one of the drivers which had influenced ICTs adoption by SMEs and was supported by 92 percent of respondents (Chapter 5, Table 5.4). Existing employees of SMEs have advocated for ICTs adoption in their business

because of its potential benefits. For instance, ICTs adoption will improve internal efficiency of the organisation, facilitates a quick flow of information to make quality decisions, and promotes products through the internet. The empirical findings in Chapter 5, Table 5.4 (and earlier noted in Chapter 3, Section 3.2.2), indicate that the SMEs in Kenya have adopted ICTs in their business processes because of the pressure from the existing staff. This finding is consistent with Nguyen (2009) who posits that SMEs have adopted ICTs in their business because of pressure from the internal environment. Similarly, Scupola (2009) argues that SMEs are highly influenced to adopt ICTs in their business because of pressure from their staff. This indicated that the existing employees have influence on ICTs adoption by SMEs.

Cost reduction was rated by 91 percent of the respondents, with a mean score of 4.35, as one of the drivers to ICTs adoption by SMEs. This finding is consistent with Schubert and Leimstoll (2006) and Maguire *et al.* (2007) who argued that ICTs adoption by SMEs has been influenced by cost reduction factor. SMEs have to gain a competitive advantage by increasing their efficiency in their operations especially in cost reduction.

Increasing sales turnover of the business was rated by 90 percent of the respondents as one of the drivers of ICTs adoption by SMEs. This finding is similar with (Nguyen, 2009 and Kariuki, 2009) who argued that SMEs who have adopted ICTs in their business enjoy numerous benefits of ICTs specifically in improving internal operations of the business and increasing their customer base. In addition, ICTs adoption by SMEs has led to accessibility to local/ international markets to sell their products and this has a positive effect on sale turnover of SMEs. SMEs need to survive, grow and develop in this era of globalisation.

ICTs adoption in SMEs increases the sales turnover and in the long run would have a positive impact on their profit margin. Thus, the findings are echoed by Moriones and Lopez (2007) who posit that SMEs are influenced to adopt ICTs in their business in order to

improve internal operations. Furthermore, Pavic *et al.*, (2007) and Vrazalic *et al.*, (2002) agree that SMEs are influenced to adopt ICTs in their business to improve their customers services, internal efficiency and competitiveness.

### **6.5 ICT Tools Used in SMEs**

The results of the study indicated that the commonly ICT tools used by Kenyan SMEs is mobile phones as rated by 89 percent of the respondents (Chapter 5, Table 5.6). SMEs owners /managers in Kenya use mobile phones for maintaining good customer relationships especially in keeping in touch with their customers (Nganga *et al.*, 2011). The finding is similar with Esselaar *et al.*, (2007) and Chiware and Dick (2008) who pointed out that usage of ICTs, especially the mobile phone, has impacted positively on profitability and has also tended to maintain customer relationship of SMEs. In addition, Frempong (2005) asserts that, in Ghana, SMEs use mobile phones for banking, transferring money, paying creditors, internet access and market surveillance. This makes mobile phones to be more popular than other ICT tools because it is a cheap tool, easy to use and operate. In addition, mobile phones are used for banking such as for checking bank balances, request for bank statements and check transactions.

In Kenyan SMEs, mobile phones are used by SMEs owners/managers for communication purposes with their customers, paying creditors, depositing money, transferring money and accessing internet. Mobile phones are used because of the relative affordability and the mobile banking services they offer (Mbogo, 2010). In Bangladesh, mobile phones are used for checking balances, money transfer, interactive games, news/information and entertainment (Islam, Khan, Ramayah, Hossain, 2011). Further in Kolhapur which is hub of the Indian textile industry, mobiles phones are used for improving productivity, communication with customers/supplies, voice and text messaging and for mobile financial transactions (Lambeek, 2009). For instance, the owner inputs a shopkeeper's order- three

bales of cotton into the phone, and then presses send. He receives the messages confirming that the order has been processed.

Personal computers are the second preferred ICT tool used by SMEs in Kenya as supported by 62 percent of the respondents (see Chapter 5, Table 5.6). Similarly, it is demonstrated in Chapter 3 (Section 3.3) that SMEs in developing countries use personal computers in their business. This finding is similar with previous researchers (Chiwere and Dick, 2008; Mutula and Brakel 2006; Raymond *et al.*, 2005 and Mokaya, 2012) who pointed out that personal computers are used by SMEs for the purpose of keeping records of customers, accessing internet, typing invoices and for other office purposes.

Internet is also used by extensively SMEs in Kenya. This was supported by 49 percent of respondents with an average score of 3.1 (Chapter 5, Table 5.6). In both Chapter 3 (Section 3.3) and the empirical findings in Chapter 5 (Table 5.6), it is confirmed that Kenyan SMEs use internet in their business. This finding is consistent with Tan *et al.*, (2010) and Kaynak *et al.*, (2005) who argue that internet adoption provides numerous benefits to SMEs in terms of cost reduction, speedy and reliable communication between and within business and customers, efficient coordination among firms, closer relationship among business partners, access to market information as well as identification of new business opportunities.

## **6.6 Benefits of ICTs Adoption by SMEs**

ICTs adoption by SMEs is critical especially when businesses need various strategies for survival, growth and development in a dynamic business environment. ICTs adoption by SMEs is considered as one of the interventions that would enhance SMEs competitiveness although it may not be a panacea to all problems faced by SMEs. SMEs which have adopted ICTs in their business are in a better position to access international markets.

The empirical findings as indicated in Chapter 5 (Table 5.9) show that 92 percent of the respondents consent that SMEs which have adopted ICTs in their business are in a position to benefit from facilitation of quick flow of information in the business. The facilitation of quick flow of information in the business assists SMEs owners/ managers to make quick and informed decisions to meet the business needs in any business environment.

Furthermore, as noted in Chapter 5 (Table 5.9) and also in Chapter 3 (Section 3.6), SMEs in Kenya have benefited in ICTs adoption by accessing robust business information which is very critical in making various decisions of the firm. Robust flow of information in the firm is considered as the lifeblood of any business in the era of competition. The finding is consistent with Tan *et al.*, (2010), Mokaya, (2012) and Irani (2002) who consistently argue that SMEs which have adopted ICTs in their business are better placed to enjoy the benefits of accessibility of robust information. Further, Berisha-Namani (2009) agreed that the ability of SMEs to achieve their goals depends on how well SMEs acquire, interpret synthesise, evaluate and understand information.

Increasing productivity in business is rated as one of the benefits of ICTs adoption by SMEs. This was supported by 91 percent of respondents with a mean score of 4.5 (Chapter 5, Table 5.9). The findings in Table 5.9 and observations in Chapter 3 (Section 3.6) indicate that the Kenyan SMEs that have adopted ICTs in their business reap the benefits of increasing productivity of their business. The results are consistent with Harindranath *et al.*, (2008) and Tan *et al.*, (2008) who point out that those SMEs who have adopted ICTs in their business are in a position to improve the productivity of the business, finance and respond quickly to customer needs. Thus, appropriate ICTs adoption by SMEs could help SMEs in cost reduction by improving internal business processes. For instance, ICTs adoption facilitates faster communication with their customers, leads to better promotion and distribution of their

products online, increases sales output and in the long run has a positive effect on the profit margins of the business.

Enhancing current market intelligence is one of the benefits of ICTs adoption by SMEs as rated by 90 percent of the respondents. See Chapter 5, Table 5.9. The findings are in line with many previous studies (Saheer and Chris, 2003; Rao, 2004; Fink and Disterer, 2006; and Kaynak, *et al.*, 2007) who posit that ICTs adoption by SMEs provides potential benefits to SMEs in terms of making SMEs to be efficient, effective and competitive (See Chapter 3, Section 3.6). In addition, SMEs will benefit in terms of improving their access to the market intelligence information and increasing efficiency in their internal operations Tan *et al.*, (2008) and Kapurubandara, (2009).

Improvement of information and knowledge management is one of the benefits of ICTs adoption by Kenyan SMEs as rated by 89 percent of the respondents as shown in Chapter 5, Table 5.9. This finding is similar to other observations by previous scholars (Lukacs, 2005; Stockdale and Standing, 2004; Weil and Vitale, 2001; Tan *et al.*, 2010) who argue that ICTs adoption by SMEs boost knowledge management in their business (See Chapter 3, Section 3.6). Information management in SMEs is considered critical in the era of competition especially in reducing transaction cost and increasing the speed of transactions for both businesses-to business and business-to-consumer transactions.

### **6.7 Barriers to ICTs Adoption by SMEs**

ICTs adoptions by SMEs are faced with multiple barriers which affect SMEs and make them not to reap the benefits of ICTs adoption in their business. The barriers to ICTs adoption by SMEs are categorised into internal and external.

The external barrier affecting the process of ICTs adoption by SMEs as rated by 90 percent of the respondents was the high cost of ICT tools (Chapter 5, Table 5.12). This findings are in

tandem with previous scholars, (Esselaar *et al.*, 2007; Kari, 2007; Galloway and Mochrie, 2005; Pokharel, 2005; Tan *et al.*, 2010) who pointed out that SMEs have failed to adopt ICTs in their business processes because of high costs of ICT tools. From the empirical findings as shown in Chapter 5 (Table 5.12) and in Chapter 3 (Section 3.4.1), some Kenyan SMEs have not adopted ICTs in their business because of the high cost of ICTs.

High cost of internet connection is rated as one of the external barriers to ICTs adoption by SMEs. SMEs have not enjoyed the numerous benefits of ICTs adoption by SMEs in their business process because of the high cost of internet connection. The lack of affordability of internet connection by SMEs was supported by 88 percent of the respondents (see Chapter 5, Table 5.12). This empirical findings is consistent with other previous scholars, (Taylor and Murphy, 2004; Frempong, 2005; Kari, 2007; Tan *et al.*, 2008; Nguyen, 2009) who pointed out that SMEs have failed to reap the benefits of ICTs adoption in their business because of high cost of internet connectivity (See Chapter 3, Section 3.4.1).

Internal barriers to ICTs adoption have contributed highly to SMEs failure to adopt ICTs in their business processes. Further, the problem is compounded by the high cost involved in training manpower on ICT related skills as rated by 67 percent of the respondents (See Chapter 5, Table 5.12). This empirical finding concur with the previous researchers (Harindranath *et al.*, 2008; Frempong, 2005; Duan *et al.*, 2002) who emphasised that SMEs have failed to adopt ICTs in their business processes because of lack of skills and resources and unavailability of adequate knowledge (see Chapter 3, Section 3.4.2).

Failure to attract and retain of qualified personnel with relevant ICTs skills is considered as one of the barriers to ICTs adoption by SMEs as rated by 64 percent of the respondents (as indicated in Chapter 5, Table 5.12). Thus, the much needed personnel with the right skills to assist SMEs in the processes of ICTs adoption are lacking. The finding is consistent with

(Nguyen, 2009; Marisini *et al.*, 2008; Kari, 2007; Galloway and Mochrie, 2005) who posit that SMEs have failed to adopt ICTs in their business because of failure to attract and retain qualified personnel (See Chapter 3, Section 3.4.2). Further, Tan *et al.*, (2010) who argue that SMEs have not adopted in their business processes because of lack of employees with the right education and technical skills in information technology.

Lack of planning and strategy is one barrier of ICTs adoption by SMEs as rated by 53 percent of the respondents (See Chapter 5, Table 5.12). SMEs owners/managers felt that SMEs have not fully adopted ICTs in their business processes because of lack of planning and strategy skills. This finding in Chapter 5, Table 5.12 and Chapter 3, Section 3.4.2 confirms that SMEs in Kenya to some extent have failed to adopt ICTs in their business processes because of lack of proper planning and strategy to give a roadmap on how to adopt ICTs their business. This findings concur with Coskun and Altunisk, 2000) who posit that SMEs have not enjoyed the benefits of ICTs adoption in their business processes because of lack of planning and strategy by SMEs owners/managers.

### **6.8 Strategies to Lessen Barriers to ICTs Adoption by SMEs**

SMEs face many barriers which limit the process of ICTs adoption. These barriers need to be resolved in order to increase chances of ICTs adoption in SMEs. Despite the barriers faced by SMEs as discussed in 5.7, there are some ICTs strategies suggested to lessen the barriers of ICTs adoption by SMEs. These strategies will minimise barriers faced by SMEs and increase chances of ICTs adoption by SMEs and finally the end result will be reaping of more benefits of adoption.

There are many strategies suggested in the literature and in the empirical results that would lessen the barriers of ICTs adoption by SMEs and enhance the degree of adoption. For instance, human capital development was rated by 94 percent of the respondents (as indicated

in Chapter 5, Table 5.15). As discussed in Chapter 5, Section 5.7, SMEs are faced with many barriers to ICTs adoption which leads to non-adoption of ICTs by SMEs. In chapter 5, Table 5.15 and Chapter 3, Section 3.5 it is noted that SMEs owners/managers considered human capital development strategy as one of the most appropriate in resolving barrier to ICTs adoption especially where SMEs have not adopted ICTs in their business processes because of lack of qualified personnel with information technology skills. The availability of qualified personnel with ICT related skills is considered as one of the key enabling factor for ICTs adoption by SMEs. The finding is consistent with (Tan *et al.*, 2008) suggestion that the government should provide subsidies and grants for ICT training and creating opportunities for firms to try new technology in their business. In addition, SMEs owners/ managers and other personnel need to be trained on SMEs broad based courses of information technology such as Microsoft office applications, desktop publishing, and webpage design.

Reduction of the cost of internet connection is considered as one of the interventions in lessening barriers to ICTs adoption by SMEs as rated by 91 percent of the respondent (see chapter 5, Table 5.15). The high cost of Internet connectivity has hindered SMEs not to enjoy the numerous benefits of ICTs adoption in their business processes. ICT tools especially the internet is necessary to SMEs in assisting making payments online and for marketing products globally. Therefore, the high cost of internet connection will hinder SMEs not to reap the benefits of ICT adoption. The finding is consistent with the argument by Alam and Noor (2009) that the reduction of internet connection will enable SMEs to tap more benefits of ICTs adoption in SMEs especially with regard to improving operational efficiency and customer service.

Increasing access to credit facilities to SMEs is one way of lessening the barriers to ICTs adoption by SMEs as rated by 87 percent of the respondents (Chapter 5, Table 5.15). Availing credit facilities to SMEs owners/managers would assist SMEs to buy modern ICT

tools and train their own manpower on ICT related skills. The credit facilities need to be availed through financial institutions and other agencies interested in fostering the interests of ICTs adoption by SMEs. The empirical findings in Chapter 5 (Table 5.15) and Chapter 3 (Section 3.5) confirm that the managers of Kenyan SMEs felt that the provision of credit facilities to SMEs will assist SMEs in areas of knowledge and innovation management, and buying of modern ICT tools. The findings are consistent with previous researchers namely: Chiware and Dick (2008) and Alam and Noor (2009) who acknowledged that SMEs need to be assisted by availing credit facilities in form of grants, tax incentives and subsidies. Lack of credit facility options has adversely affected the process of ICTs adoption by SMEs.

Collaborative usage of ICT tools by other businesses in the same business environment was also considered as one of the appropriate strategies used to lessen barriers of ICTs adoption by SMEs. This was rated by 78 percent of the respondents (see Chapter 5, Table 5.15). Most of the respondents felt that SMEs who do not have their own ICT tools would use ICT tools collaboratively with those SMEs that have adopted ICTs in their business processes. This will enable SMEs to have access to the internet facility and sell their products online to local and international markets. For instance, for SMEs which are not financially stable, such an approach would be most appropriate in the sense that SMEs will be able to use the existing ICT tools available collaboratively with other SMEs in the same vicinity. This, in the long run, would have a positive effect on their profit margin.

Addressing security issues related to the adoption of ICTs by SMEs was rated by 78 percent of the respondents as one of the strategies to lessen barriers to ICTs adoption (See chapter 5, Table 5.15). The result in Chapter 5 (Table 5.15) and in Chapter 3 (Section 3.5) both confirm that SMEs owners/managers believe that addressing security issues related to the usage of ICT tools by SMEs would increase chances of ICTs adoption. SMEs owners/managers are sceptical in using ICT tools especially in making online payments. The finding is similar with

Taylor and Murphy (2004) who pointed out that addressing security issues related to usage of ICTs tools would enhance the degree of ICTs adoption by SMEs.

### **6.9 Role of Government Support to SMEs**

Government plays various roles in supporting SMEs to adopt ICTs in their business. The majority of the respondents with a rating of 91 percent suggest that the government should provide grants/subsidies/consultancy services in order to assist SMEs to adopt ICTs in their business. See chapter 5, Table 5.17. The government should provide grants /subsidies to SMEs for them to be in a position to attract and retain the qualified manpower needed in the process of ICTs adoption.

By providing grants and subsidies to SMEs, the government would enable SMEs owners/managers and other employees to go for further training in courses relevant to the attainment of ICT skills. This would enable SMEs owners/managers to understand and appreciate the potential benefits of ICTs adoption in their business processes. The provision of grants and subsidies would enable SMEs to buy new and modern ICTs in order to compete with other businesses in terms of technological changes. This finding is consistent with the position by Alam and Noor (2009) who argued that government support in terms of consultancy, technical advice, grants and subsidies to SMEs is critical in ICTs adoption.

Provision of relevant information by the government officers to SMEs owners/managers is one way SMEs will be assisted in ICTs adoption in their business. The majority of the respondents 88 percent, (see chapter 5, Table 5.17), confirm that the provision of relevant information to SMEs owners/managers more especially on the importance of ICTs adoption by SMEs, will increase chances of adoption. There must be a deliberate effort by government officers to provide relevant information pertaining to potential benefits of ICTs adoption. This would enable SMEs owners/managers to make quick and informed decisions on whether

to adopt ICTs in their business processes or not. For instance, ICTs adoption by SMEs will enable SMEs to access international markets, quick gathering of market intelligence information and facilitates faster communication in organisations, good accounting and management practices. Such findings are consistent with Tan *et al.*, (2008) who argue that the provision of relevant information about the benefits of ICTs to SMEs is one of the enabling factors in ICTs adoption by SMEs. In addition, this would encourage SMEs owners/managers to adopt ICTs in their business without any delay and with no fear. In Chapter 3 (Section 3.5), it is noted that SMEs owners/managers have failed to adopt ICTs in their business because there is a lack of information on the potential benefits of ICTs adoption.

Government also assists SMEs in formulating ICTs training policy as rated by 64 percent of respondents (see Chapter 5, Table 5.17). A clear ICT training policy is very necessary in the sense that it would assist SMEs to have the right manpower with relevant skills in ICTs to facilitate the process of ICTs adoption. ICTs training policy would ensure that all children from primary school to university level and other tertiary institutions are equipped with ICT related skills. This would have long term effect in attracting and retention of manpower in SMEs to assist in ICTs adoption.

#### **6.10 Testing of the constructs in the Proposed Conceptual Framework Model**

The conceptual framework proposed on ICTs adoption by Kenyan SMEs consists of variables which are critical in understanding the process of ICTs adoption. These variables include: drivers, barriers, ICT tools used, strategies used to lessen barriers to ICTs adoption and benefits of ICTs adoption. The findings show that external drivers of ICTs adoption by SMEs have a significant influence on almost all ICT tools used by SMEs except mobile phones. Thus, the adoption of mobile phones may not be influenced by external drivers because the tool is easier to use and operate compared to other ICT tools. In addition, mobile

phones are not expensive compared to other ICT tools in the Kenyan market. The ICT tools used by SMEs are computers, laptops, printers, photocopiers machines, landline telephone, internet, websites, telex, typewriters and scanners.

Internal drivers of ICTs adoption by SMEs have insignificant influence on the adoption of all ICT tools except the mobile phones and telex. This shows that internal drivers do not have more influence on the adoption of mobile phones. This may be due to ICT compatibility in usage and ease of operation by SMEs owners/managers.

On the barriers to ICTs adoption and influence on the usage of ICT tools by SMEs, it was indicated that external barriers had a positive and significant influence on the usage of personal computers, printers, and website. Similarly, the internal barriers to ICTs adoption have a significant influence on the usage of printers, internet, telex and typewriter. This demonstrated that more usage of ICT tools was hampered by the internal barriers to ICTs adoption by SMEs.

The regression analysis approach was used to find out whether more adoption of ICT tools by SMEs would realise more benefits to SMEs. The result showed that more usage of printers, photocopier machines, mobile phones, telexes, scanners and typewriters by SMEs would lead to more benefits to SMEs as presented in chapter 5, Table 5.13.

## **6.11 Summary**

In this chapter, internal and external drivers to ICTs have been discussed. Internal drivers seem to have played a great role in the process of ICTs adoption by SMEs. The ICT tool commonly used by SMEs was the mobile phone. Barriers to ICTs adoption by SMEs have been discussed. The barriers to ICTs adoption were categorised into two parts: internal and external. The internal barrier seems to have contributed greatly in impeding the process of ICTs adoption by SMEs as compared to external barriers. However, to some extent, external

barriers have also contributed to SMEs not adopting ICTs in their business processes. Various strategies to lessen barriers to ICTs adoption have been elaborated. For instance, human capital development has been considered as the best strategy to be pursued to lessen the barrier to ICTs adoption by SMEs. But the strategy should not be pursued in isolation from other strategies discussed.

There are many benefits of ICTs adoption by SMEs. These benefits have been discussed and include facilitation of quick flow of information in the business and the positive role of government in supporting SMEs. The government plays a significant role in supporting SMEs in terms of giving grants, subsidies and tax holidays to facilitate the process of ICTs adoption by SMEs. Testing of the relationship of the proposed conceptual framework also is outlined. The factors which influence the process of ICTs adoption by SMEs and usage of ICTs have been discussed. Further, the internal and external barriers to ICTs adoption and their influence on the usage of ICT tools have been expounded. The subsequent Chapter presents the conclusions and recommendations of the study.

## CHAPTER 7

### CONCLUSION AND RECOMMENDATIONS

#### 7.1 Introduction

This chapter presents a summary of the major findings based on data analysis and interpretation. The analysis and interpretation giving rise to recommendations was based on the objectives of the study and a discussion of relevant literature from previous studies. The chapter presents summary of key findings, conclusion, recommendations, limitations and proposed areas for further research.

#### 7.2 Summary of key findings

##### 7.2.1 Drivers of ICTs adoption by SMEs

The analysis of data revealed that SMEs that were the focus of the study use ICTs for reasons such as improving customer relations and meeting customer needs. Private limited company ownership is highly influenced to adopt ICTs in their business processes by internal and external drivers whereas old and other businesses that have been in operational for some time are influenced to adopt ICTs in their business by internal drivers than external drivers.

##### 7.2.2 ICT Tools and Benefits of ICTs adoption

The most commonly used ICT tools by SMEs in the study are mobile phones and personal computers. These tools facilitate quick flow of information within and outside the business, thus enhancing productivity, survival and growth.

The result also indicates that there is a statistically significant relationship between ownership and age of the business in ICTs adoption by SMEs. SMEs which have been in operation (old) for a period of more than ten years or more use most of ICT tools than young and middle aged businesses.

Private limited company ownership uses most of the ICT tools than sole proprietorship and partnership. In addition, Private limited companies ownership which has adopted ICTs in their business processes tends to reap more benefits of ICTs adoption.

### **7.2.3 Barriers to ICTs adoption**

A number of barriers exist in the adoption of the ICT tools by SMEs. The barriers include; inadequate resources to employ qualified personnel, high cost of training existing personnel on ICTs related skills and high cost of ICTs tools.

Private limited companies ownership experienced more of external barriers to ICTs adoption than sole proprietorship and partnership. Old and other businesses in existence for some time experienced more of internal barriers of ICTs adoption than young businesses.

### **7.2.4 Strategies to enhance ICTs adoption by SMEs**

Various strategies have been suggested in a number of studies to mitigate barriers to ICT adoption by SMEs. The current study found human resource development and reduction of internet costs as potential strategies to increase ICT adoption rate.

Furthermore, access to credit facilities could increase SMEs access to ICT tools, in particular, computers. Private limited companies and partnership ownership businesses are better placed to put in place strategies to lessen the barriers to ICTs adoption.

### **7.2.5 The Role of Government in ICTs adoption by SMEs.**

One of the most significant findings from the study was that the government should play a critical role in the adoption of ICTs by SMEs by giving grants, subsidies, tax incentives and providing consultancy services.

Further, the results also noted that developing a comprehensive ICTs training policy is one way the government could support SMEs to address the need of human resource development in information technology skills.

#### **7.2.6 Testing of relationship of the constructs in the Conceptual Framework Model**

External drivers to ICTs adoption have a positive influence on the usage of ICT tools by SMEs. On the other hand, external barriers to ICTs adoption have a negative influence on the usage of ICT tools by SMEs. Indeed, more usage of ICTs tools by SMEs would lead to a greater realisation of benefits in SMEs.

### **7.3 Conclusion**

The conclusions are informed by the background study, literature review and results of the study. The literature review of the study indicates that SMEs contribute a lot to the Kenyan economy in terms of Gross Domestic Product, employment and wealth creation. Secondly, SMEs in Kenya face multiple barriers to ICTs adoption such as lack of financial resources and limited access to the markets, limited access of information and infrastructure. These barriers inhibit the process of ICTs adoption by SMEs. Thirdly, ICTs adoption by SMEs is influenced by internal and external drivers to ICTs adoption. Fourthly, the mobile phone is the mostly used ICTs tool by Kenyan SMEs because of its compatibility and advantages. Fifthly, in the light of Technology Acceptance Model and Organisation theory, any new technology adopted in business is guided by the principle of perceived usefulness and ease of use of the technology. In addition, the organisation theory states that a change which takes place in any business is supported by management. This increase chances of ICTs adoption in SMEs.

Sixth, the survey data and literature review confirms that SMEs which have adopted ICTs in their business processes reap more benefits of ICTs adoption. This is especially the case

when barriers of ICTs adoption are lessened. Seventh, the development of human capital, tax reduction on ICTs and reduction of internet costs are some of the key areas the government would support SMEs in ICTs adoption. Eight, the dissemination of the right information about the potential benefits of ICTs to SMEs owners/managers increase chances of ICTs adoption in SMEs. Ninth, introduction of M-PESA by Safaricom has encouraged the adoption of ICTs in SMEs. Further, this has compelled SMEs owners /managers to have a mobile phone to enjoy the benefits of M-PESA. Finally, government should continue providing incentives to SMEs to encourage SMEs to adopt ICTs in their business processes.

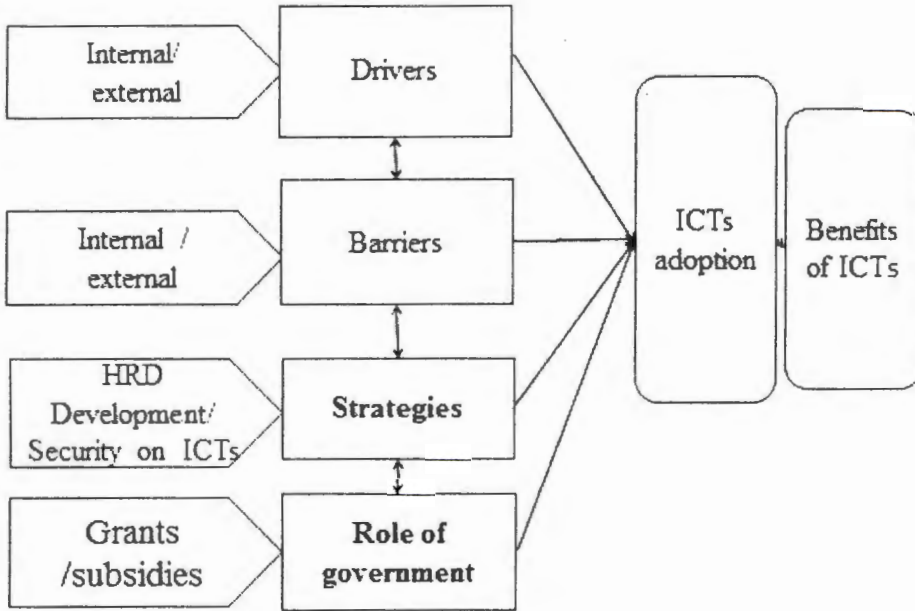
#### **7.4 Contribution of the Study**

The study has highlighted valuable contributions. These valuable implications are discussed under three areas namely: contribution to theory, contribution to methodology, contribution to policy and practice.

##### **7.4.1 Contributions to theory**

The major contributions of the study to existing theory include extension of the literature of ICTs adoption by SMEs and the development of an ICTs adoption model as indicated in figure7.1.

**Figure 7.1 Proposed ICTs adoption Framework Conceptual Model**



**HRD**=Human resource Development Strategy

The theoretical framework (chapter 2) discussed various models of ICT adoption by SMEs. However, all these models were based on studies undertaken in the West. This includes models such as the Diffusion Innovation Theory (DIT), Theory of Reasoned Action (TRA) and The Technology Acceptance Model (TAM). Further, the construct of the role of the government in ICTs adoption by SMEs is not clear in the models described. To fill the gap, the proposed conceptual Framework Model addresses the strategies to be pursued by SMEs to mitigate barriers to ICTs adoption. The model will enable SMEs owners/managers to do self-assessment in the process of ICTs adoption. Further; the model sheds light on key critical constructs which one need to understand and develop appropriate mechanism to facilitate the process of ICTs adoption in SMEs.

#### 7.4.2 Contribution to Methodology

The methodology used in this research gives guidelines for further research. This includes the survey design adopted, wording, design and development of the survey instrument. The testing of reliability and validity of data was done using inter-item correlation and *Cronbach's* alpha coefficient. The testing of the relationships of the proposed conceptual framework model was done using the regression analysis technique.

First, it is difficult in surveying SMEs selected for the study. However, careful consideration was taken in wording, designing and developing the survey instrument to capture the core constructs of the study. The strategy adopted in data collection was “drop and pick later” to allow the respondents to give comprehensive information on the constructs. Second, the data collected by the survey instrument was tested for reliability and validity. Specifically, content validity was done to ensure irrelevant questions were eliminated from the survey instrument. Further, face and convergent validity was done by seeking opinions of experts on the topic under investigation and pilot testing the survey instrument with few SMEs owners/managers before conducting main study. Convergent validity was tested using *Cronbach's* alpha coefficient. Third, regression analysis technique was used to test the relationships of constructs in the proposed conceptual framework model. Further, to ensure factorial validity and reliability, exploratory factor analysis and reliability was done to determine the *Cronbach's* Alpha coefficient. Fourth, Analysis of Variance (ANOVA) was purposely used to analyse the effect of business ownership and age of business and its influence on ICTs adoption by SMEs.

### **7.4.3 Contributions for Policy and Practice.**

The findings of the study and respective recommendations will be useful to the policy makers, owners/managers of SMEs, higher institutions of learning, financial institutions, non-governmental organisations and training consultants.

#### **7.4.3.1 Policy Makers**

The finding of this study informs policy makers as the evidence suggests that ICT tools in the Kenyan market are expensive and not affordable by SMEs. Based on this finding, policy makers should identify appropriate interventions to assist SMEs access ICT tools. This will enable SMEs owners/managers to buy modern ICT tools which are compatible with their needs. For instance, financial institutions need collateral which most SMEs do not have and this makes SMEs not have access to credit facilities. Thus, SMEs need to be assisted to access credit facilities at reasonable interest rates.

#### **7.4.3.2 Owners/Managers of SMEs**

SME owner/managers will greatly benefit from the study because they will understand and appreciate the importance of ICTs adoption. Ramsay *et al.*, (2003) posits that ICT tools are no longer seen as technical tools, but as business tools which add value to the business. Furthermore, the conceptual framework proposed in this study would act as a guideline to SMEs owners/managers to make informed decision on ICTs adoption. The framework consists of critical constructs for ICTs adoption such as drivers, barriers, ICT tools, benefits and strategies to be pursued to lessen barriers to ICTs adoption.

Further, the findings of this study will assist SMEs owners/managers to have a big picture of the different roles the government play in supporting SMEs to adopt ICTs in their business processes. Many SMEs owners/managers are not aware of the types of assistance they are

entitled to get from the government by virtue of their business. Therefore, this study would be an eye-opener to SMEs owners/manager to know various forms of assistance they are entitled to get from their government.

#### **7.4.3.3 Institution of Higher Learning and other Tertiary Institutions**

The findings of the study would assist higher learning institutions to introduce practical interventions in the development of SMEs through the use of ICTs by ensuring that students are equipped with the necessary Information Technology skills in their curricula. As indicated in existing literature and, as was confirmed by the current study, shortage of ICTs related skills is one of the major barriers in the use of these technologies. Manpower development, especially in Information Technology skills is considered as one of the key enabling factors for ICTs adoption by SMEs.

Institutions of higher learning should introduce an internship programme for business Information Technology students to be attached in SMEs businesses to get practical experience on how business operates. In this way, SMEs will benefit from the students who are on industrial attachment programmes.

#### **7.4.3.4 Financial Institutions**

Lack of financial resources has been cited as one of the barriers of ICTs adoption by SMEs. Various studies have indicated in the literature that SMEs have failed to adopt ICTs in their business processes because of lack of financial resources. Similarly, the current study identified access to financial resources as a serious challenge. Therefore, there is need for financial institutions to have flexible lending policies to enable SMEs owners/managers to access credit.

#### **7.4.3.5 Non-Governmental Organisations**

Non-governmental organisations will find this study important as barriers faced by SMEs in the adoption of ICTs in Kenya have been identified. This will also compel management of Non-government organisations to come up with various appropriate interventions to assist SMEs in ICTs adoption.

#### **7.4.3.6 Training Consultants**

The training consultants would find this study useful since it would inform them to develop appropriate training programs tailored to the needs of SMEs. As discussed in the literature review (chapter 3), SMEs have failed to adopt ICTs in their business processes because of lack of awareness of the potential benefits of ICTs adoption.

Training consultants will find this study useful in developing various strategies to monitor the training needs of SMEs by taking into account the internal and external environmental changes. Further, training consultants will continuously improve their training contents as the business environment demands.

### **7.5 Recommendations**

SMEs owners/managers, policy makers and other stakeholders should consider the following recommendations, in the light of existing literature and findings from the current study.

- The government should create resource information centres to provide right information to SMEs owners/managers on the potential benefits of ICTs adoption. The resource centres should be located in rural and urban areas.
- More potential benefits of ICTs adoption will be realised in SMEs only if appropriate strategies are developed or put in place to lessen barriers to adoption.

- The government should provide the necessary support to SMEs in form of grants, tax incentives and loans at concessional rates. This would encourage SMEs owners/managers to adopt ICTs in their business.
- The government need to come up with a comprehensive ICTs policy to address issues related to security, and usage of ICTs by SMEs. This policy will ensure that all ICT assets are protected against any damage.
- There is need for promoting and encouraging local industries to manufacture local ICT tools that are tailored to the needs of SMEs. .
- The government must come up with training centres to impart the necessary Information Technology skills to SMEs owners/managers especially on technical skills which are critical in the process of ICTs adoption in SMEs.
- Training centres, refresher workshops and seminars should be encouraged whenever an opportunity arises especially during the time of renewal of trading licence so that they equip SMEs owners/managers with latest and relevant ICTs skills.
- Seminars or workshops must be used as a platform to disseminate information on the importance of ICTs adoption in SMEs. Thus, subsidised training and seminars emphasising on the importance of ICTs adoption by SMEs can make owners/managers develop favourable attitudes and become receptive on the idea of adopting ICT in their business.
- The management of four mobile providers in Kenya (Safaricom, YU, Airtel and Orange) must ensure that rural areas have the necessary network connectivity (Infrastructure). These infrastructure facilities will increase the usage of ICT tools by SMEs in rural areas.
- M-PESA cash float problems must be looked into so that the SMEs transactions are conducted without any problem. Most agents of M-PESA must always liaise with

their service providers to ensure that cash float is always reasonable and managed properly to cater for the needs of SMEs which are located in rural areas where withdrawals are high. These will ensure that SMEs in the rural areas transact their businesses without any problem related to cash transactions.

- SMEs owners/managers need to know the various assistance frameworks that they are entitled to get from the government especially in ICTs adoption. Therefore, those who are tasked to assist SMEs must provide the right information and create awareness on the benefits of ICTs to enable SMEs to adopt ICTs in their business processes.
- There is need for the development of internal Information Technology skills to produce high levels of success in ICTs adoption by SMEs.
- Deliberate measures must be taken by the government to provide ICT products and services at affordable prices to SMEs. This will enhance the degree of ICTs adoption by SMEs.
- The government must ensure that there is availability of professional and consulting advice to SMEs especially on ICTs adoption at an affordable fee.
- The government must make deliberate effort in human resource development. Capacity building in human resources must be based on clear and flexible strategies that can respond quickly to the needs of SMEs.
- SMEs must invest a lot of resources in educating their staff and management about the importance of ICTs.
- SMEs must also invest in their recruitment or outsourcing of employees. They must recruit employees who are knowledgeable in ICTs. This will facilitate the transfer of knowledge easily to other employees in the organisation. Thus, this will enable SMEs to adopt ICTs and reap more benefits.

- ICT strategies must be factored in the SMEs vision and mission. In addition, the ICT strategy of SMEs must be in line with the business strategy. This must be done purposely to enhance the degree of ICTs adoption by SMEs.
- SMEs owners/managers must develop a culture of innovative technology in organisation to cope with changes in the business environment. This would ensure SMEs workforce is abreast with changes in technology.

## **7.6 Limitations of the Study**

The study makes useful and insightful contributions to the body of knowledge. However, some limitations need to be acknowledged. The current investigation did not cover SMEs from all sectors of the economy. The study focused on only two sub- sectors of SMEs that is, furniture and wood and metal and fabrication which do not comprise all SME sectors in Kenya.

The study adopted cross-sectional survey where data was collected at a single point of time. This has its own limitations. Therefore, there is need for a longitudinal survey to validate the findings of this study. Furthermore, longitudinal survey is encouraged to disclose any causal relationship of ICTs adoption and performance of SMEs based on the time frame.

In the data gathering process, there was high degree of reluctance from the respondents because they were interested to know how the study would help them to get financial assistance to increase working capital of their business. The researchers spent a lot of time convincing the respondents to understand and appreciate the importance of giving correct information on the variables investigated. In addition, time was also spent in explaining to the respondents the purpose of the study because they thought that the study would be used to outsource funds from non-government organisation for individual benefit.

The current study has only examined the following variables that are drivers, ICT tools used, barriers to ICTs adoption, benefits, strategies and role of government support in SMEs. More variables need to be incorporated to get more insight into the process of ICTs adoption by SMEs.

### **7.7 Directions of Future Research**

There is need for large samples of SMEs to be used in future studies that employ multivariate analysis. Further work also needs to be carried out from a comparative investigation on various SMEs sub-sectors in the country so as to have a holistic view of ICTs adoption by SMEs in terms of regions and industries. Comparative investigation would give a true picture on drivers, barriers, strategies to be pursued to lessen barriers to ICTs adoption by SMEs in different industries.

There is need for investigation on how managerial practices of SMEs will affect the processes of ICTs adoption by SMEs. These practices include strategic planning, organisation, motivation and controlling. In addition, there is need to investigate whether the government is really a major driving force for ICTs adoption by SMEs and if so what role the government should play in the process of ICTs adoption.

The proposed conceptual framework on ICTs adoption by SMEs comprises five dimensions: drivers, ICT tools, barriers, strategies and benefits of ICTs adoption. Future researchers need to incorporate more variables to the proposed framework on ICTs adoption. Furthermore, researchers also need to consider investigating ICTs adoption by SMEs on cross-border basis especially in the East African countries to get insight on ICTs adoption by SMEs. This will shed light on how drivers and barriers influence and inhibit the process of ICTs adoption by SMEs in different socioeconomic contexts.

## **7.8 Summary**

This chapter has summarized the major findings of the study according to the research objectives. The contributions of the study have been explained with special emphasis placed on contributions for theory, policy and practice. Contributions for policy and practice have been divided into sections relating to: policy makers, SMEs owner/managers, training consultants, institution of higher learning, financial institutions and non-government organisations. Recommendations are suggested to improve the processes of ICTs adoption by SMEs. The study has, for instance, recommended that there is need for deliberate efforts to be made more especially in capacity building of human resources to assist in the process of ICTs adoption by SMEs. Limitations of the study have been expounded. Since the study only covered two types of SMEs sub-sectors namely, furniture and metal and fabrication, it is recommended that future direction of research be expanded beyond these areas. For instance, there is need for one to undertake research considering other SMEs sub-sectors instead of only two sub sectors in order to get a holistic view on the constructs investigated.

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## APPENDIX I: QUESTIONNAIRE

### QUESTIONNAIRE

**Dear Respondents,**

I am Henry Ongori, a PhD student at the North West University, South Africa. As a requirement for the award of a PhD degree in Management, I am conducting research on: “*Adoption of Information Communication Technologies (ICTs) in Kenyan Small and Medium Enterprises (SMEs)*”. I request you to answer the following questionnaire to assist me get data for the project. The information provided will strictly be used for the purpose of the study and treated as confidential. You are not required to indicate your name on the questionnaire.

#### **A. Demographic profile**

##### 1. Gender

Male

Female

##### 2. Age group:

18-25 years

26-35 years

36-45 years

46-55 years

Over 55 years

3. Ethnic affiliation:

Kisii

Kikuyu

Luo

Kalenjin

Luhya

Others (Specify) \_\_\_\_\_

4. What is your highest academic qualification?

KCPE

KSCE

Diploma

Degree

Postgraduate degree

5. Years of experience in business.

1-5years

6-10years

1-15years

16-20years

Over 20 year's

**B. Business profile**

6. Form of business- ownership:

Sole proprietor

Partnership

Private limited Company

7. Sector of business operation

Metal & Fabrication

Furniture

Other (specify) \_\_\_\_\_

8. Age of the business:

1-5

6-10

11-15

16-20

Over 20

9. How many people are currently employed in your business? \_\_\_\_\_

**C. Driving forces of ICTs adoption by SMEs**

Which of these factors drive your decision to adopt ICTs in your business? Rate them using a scale of (5= strongly agree, 4= Agree, 3=Neutral, 2=Disagree, and 1=strongly disagree).

	<b>Drivers</b>	5	4	3	2	1
10	Customer demands	5	4	3	2	1
11	Cost reduction	5	4	3	2	1
12	Improve customer services	5	4	3	2	1
13	Increase sales	5	4	3	2	1
14	Improve internal efficiency	5	4	3	2	1
15	Facilitate the control of business	5	4	3	2	1
16	Improve relations with other business partners	5	4	3	2	1
17	Availability of skilled manpower	5	4	3	2	1
18	Facilitate growth of the business	5	4	3	2	1
19	Large volume of information to be managed.	5	4	3	2	1
20	Develop new markets	5	4	3	2	1
21	Demands from SMEs associations	5	4	3	2	1
22	Pressure from trade associations	5	4	3	2	1
23	Pressure from government	5	4	3	2	1
24	Pressure from the labour unions	5	4	3	2	1
25	Pressure from the staff	5	4	3	2	1
26	Pressure from competitors	5	4	3	2	1

27. Others (Please specify) -----

#### D. ICT tools used in business

Please indicate below by ticking the ICT(s) tool (s) used in your business. Rate them using a 5 point scale of (5=Most used, 4=Used, 3=sometimes used, 2=least used, 1=not used at all).

	ICT tools	5	4	3	2	1
28	Personal computers	5	4	3	2	1
29	Laptops	5	4	3	2	1
30	Fax	5	4	3	2	1
31	Printer	5	4	3	2	1
32	Photocopier	5	4	3	2	1
33	Mobile phones	5	4	3	2	1
34	Internet	5	4	3	2	1
35	Website	5	4	3	2	1
36	Landline telephones	5	4	3	2	1
37	Telex	5	4	3	2	1
38	Scanner	5	4	3	2	1
39	Typewriter	5	4	3	2	1

40. Others (please specify) \_\_\_\_\_

### E: Benefits of ICTs adoption in SMEs.

Adoption of ICT tools will offer the business the following benefits. Rate the indicated benefits using a 5- point scale of (5=strongly agree, 4=agree, 3=neutral, 2=disagree, 1= strongly disagree).

	<b>Benefits</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
41	Accessibility to international markets	5	4	3	2	1
42	Enhance current market intelligence information gathering	5	4	3	2	1
43	Facilitation of quick flow of information within business from internal and external sources	5	4	3	2	1
44	Increased productivity in business processes	5	4	3	2	1
45	Reduced operation costs in running the business	5	4	3	2	1
46	Link to local and global supply chains and outsourcing opportunities	5	4	3	2	1
47	Encouragement of inter-intra business transactions	5	4	3	2	1
48	Improvement of information and knowledge management	5	4	3	2	1
49	Sharing and learning of new business practices	5	4	3	2	1
50	Compliance with government requirements such as business registration and filling tax returns.	5	4	3	2	1
51	Increased efficiency	5	4	3	2	1
52	Facilitation of payments to third parties	5	4	3	2	1
53	Enhancing the company image (Webpage)	5	4	3	2	1
54	Reduced cost of communication	5	4	3	2	1
55	Achievement of more customer satisfaction.	5	4	3	2	1
56	Monitoring the performance of competitors	5	4	3	2	1
57	Reduction of the overall workload of employees	5	4	3	2	1
58	Monitoring of quality control systems	5	4	3	2	1
59	Decreases in sales staff travel time	5	4	3	2	1
60	Flexibility/adaptability of organizational activities	5	4	3	2	1

61	Improved labour/employee relations	5	4	3	2	1
62	Gain competitive advantage	5	4	3	2	1
63	Increase returns on investments	5	4	3	2	1

64. Other (Please specify) \_\_\_\_\_

#### F. Barriers to ICT(s) adoption in your business

In the table below, indicate the extent to which the following factors serve as barriers to adoption of ICTs in your business. Rate them using a 5 point scale of (5=very high, 4=high, 3=moderate, 2=low, 1= very low)

	Barriers	5	4	3	2	1
65	High cost of ICTs	5	4	3	2	1
66	High cost of internet connection	5	4	3	2	1
67	Slow internet connection	5	4	3	2	1
68	Lack of ICTs-related support	5	4	3	2	1
69	Staff not understanding the use of ICTs	5	4	3	2	1
70	Lack of security in the use of ICTs	5	4	3	2	1
71	Owner/managers' unawareness of the benefits of ICTs	5	4	3	2	1
72	Lack of SMEs' ICTs legal framework	5	4	3	2	1
73	Cost of ICT maintenance	5	4	3	2	1
74	Lack of financial resources to buy ICT tools	5	4	3	2	1
75	Frequent power failure/interruptions	5	4	3	2	1
76	Difficulty in employing qualified personnel	5	4	3	2	1
77	Lack of defined strategy to encourage ICTs' adoption	5	4	3	2	1
78	ICTs do not satisfy the needs of the business	5	4	3	2	1
79	Not sure what ICT tool to adopt	5	4	3	2	1
80	Resistance to change (old way of working)	5	4	3	2	1
81	High cost of training employees	5	4	3	2	1
82	Lack of information on the benefits of adopting ICT tools in business	5	4	3	2	1

83. Other (please specify) \_\_\_\_\_

### G: Strategies to resolve Barriers to ICTs adoption and assimilation in SMEs.

Which of the following strategies could be implemented to address barriers to ICTs adoption in your business? Please rate them in order of importance (5=very important, 4=Important, 3= least important, 2= Not sure and 1=not important at all).

	Strategies to decrease barriers to ICTs adoption	5	4	3	2	1
84	Human capital development (e.g. training of owner/managers/ staff)	5	4	3	2	1
85	Reduce cost of internet connection	5	4	3	2	1
86	Addressing security issues on the use of ICT tools	5	4	3	2	1
87	Improve internet connectivity (speed)	5	4	3	2	1
88	Increase access to credit (e.g. from government, banks)	5	4	3	2	1
89	Use of alternate power sources	5	4	3	2	1
90	Enabling ICT policy (regulatory framework)	5	4	3	2	1
91	Liberalisation of telecommunication sector	5	4	3	2	1
92	Collaborative use of ICTs tools	5	4	3	2	1

93. Other (please specify) \_\_\_\_\_

### H. Role of Government

The government is expected to play a role in supporting SMEs to adopt ICTs. Indicate the degree of usefulness of the following government support to your business using a scale of (5=Most useful, 4=Useful, 3=Sometimes useful, 2=Least useful and 1=Not useful at all).

	Roles	5	4	3	2	1
94	The Government supports SMEs by grants/subsidies (business planning, consultancy, etc.)	5	4	3	2	1
95	Government provides information about benefits of ICTs	5	4	3	2	1
96	There exists government Policy on ICTs adoption in SMEs	5	4	3	2	1
97	There is an ICT Training policy	5	4	3	2	1
98	There is a national ICT policy	5	4	3	2	1

99. Other (Please specify) \_\_\_\_\_

**Thank you for completing this questionnaire.**

APPENDIX 2: RESEARCH PERMIT

PAGE 2

THIS IS TO CERTIFY THAT:

Prof./Dr./Mr./Mrs./Miss HENRY  
ONGORI

of (Address) UNIVERSITY OF NORTHWEST  
SOUTH AFRICA

has been permitted to conduct research in.....

..... Location,  
..... District,  
NAIROBI, RIFT VALLEY & NYANZA  
..... Province, s

on the topic ADOPTION AND ASSIMILATION  
OF INFORMATION COMMUNICATION  
TECHNOLOGIES (ICTs) IN: KENYAN  
SMEs

for a period ending 31ST MAY .. 20 10

PAGE 3

Research Permit No. NCST/5/002/R/1055  
Date of issue 11.12.2009  
Fee received SHS 2000



  
Applicant's  
Signature

  
Secretary,  
National Council for  
Science and Technology



**APPENDIX 3: RESEARCH AUTHORISATION, NATIONAL COUNCIL FOR  
SCIENCE AND TECHNOLOGY, KENYA**

REPUBLIC OF KENYA



**NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY**

Telephone: "SCIENCE TECH", Nairobi  
Telephone: 254 020-241349, 2213102  
Fax: 254 020 2413123  
Cell: 254 079 2213215, 318245, 318249  
When replying please quote

P.O. Box 30623-00100  
NAIROBI-KENYA  
Website: www.ncst.go.ke

Our Ref:

NCST/5/002/R/1055/7

Date:

15<sup>th</sup> December, 2009

**Henry Ongori  
University of Northwest  
SOUTH AFRICA**

Dear Sir,

**RE: RESEARCH AUTHORIZATION**

Following your application for authority to carry out research on "*Adoption and Assimilation of information communication Technologies (ICTs) in Kenya*", I am pleased to inform you that you have been authorized to undertake your research in selected Districts in Kenya for a period ending **31<sup>st</sup> May 2010.**

You are advised to report to **The Provincial Commissioners and the Provincial Directors of Education** before embarking on your research project.

Upon completion of your research project, you are expected to submit two copies of your research report/thesis to our office.

**PROF. S. A. ABDULRAZAK Ph.D, MBS  
SECRETARY**

Copy to:

**The Provincial Commissioners  
The Provincial Directors of Education**

**APPENDIX 4: RESEARCH AUTHORISATION, Office of the President, Nakuru,  
Kenya**

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## OFFICE OF THE PRESIDENT

PO BOX 119000 "RIFT VALLEY" Nakuru  
Telephone: Nakuru 2216566 and 2216523  
When replying please quote



PROVINCIAL COMMISSIONER  
RIFT VALLEY PROVINCE  
P.O. Box 28  
NAKURU

R. ADM 15/1/5 VOL IV/48

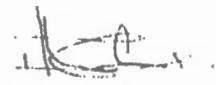
28/01 APRIL 2010

Henry Ongori  
University of North West  
SOUTH AFRICA

**RE: RESEARCH AUTHORIZATION**

Following your application for authority to carry out research on "*adoption and Assimilation of information Communication Technologies (ICTs) in Rift valley Province*".

You are hereby authorized to undertake your research in selected districts in Rift valley Province up to 31<sup>st</sup> May 2010.

  
S.N. MUSUMBA  
FOR: PROVINCIAL COMMISSIONER  
RIFT VALLEY PROVINCE

APPENDIX 5: RESEARCH AUTHORISATION, Ministry of Education, Nakuru,  
Kenya

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## MINISTRY OF EDUCATION

Telegrams:"  
EDUCATION, R.V.P.  
Telephone: 051-2216917  
When replying please quote



PROVINCIAL DIRECTOR  
OF EDUCATION  
RIFT VALLEY PROVINCE  
P. O. BOX 259,  
NAKURU.

Ref. PDE /RV/B/17/95

DATE 29<sup>TH</sup> April, 2010

TO WHOM IT MAY CONCERN

RE: RESEARCH AUTHORIZATION – REF NO: NCST/5/002/R/1055/7

HENRY ONGORI

This is to inform you that the above named who is a student at University of South Africa, has been given permission to conduct a research on “ Adoption and Assimilation of Information Communication Technologies ( I.C.T.S ) in Kenya”. He has been permitted to conduct the research in Selected Districts in Rift Valley Province.

Any assistance accorded to him will be highly appreciated.

A handwritten signature in black ink, appearing to read 'Caleb Omondi'.

**CALEB OMONDI**  
For **PROVINCIAL DIRECTOR OF EDUCATION**  
**RIFT VALLEY PROVINCE**

Cc: National Council for Science and Technology  
P.O Box 30623-00100  
**NAIROBI**

**APPENDIX 6: RESEARCH AUTHORISATION, Office of the President, Kisumu,  
Kenya**

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**OFFICE OF THE PRESIDENT**

Office of the Provincial Commissioner  
Telephone: Kisumu 2023954/fax 2023945  
When replying please quote  
E-MAIL: pcnyanza2009@yahoo.com

THE PROVINCIAL COMMISSIONER  
NYANZA PROVINCE  
P.O. Box 1912-40100  
KISUMU

Off. Ref. ADM. 10.1/VOL. VIII/ (111)

26<sup>th</sup> April, 2010

City of Cape Town  
Department of North West  
SOUTH AFRICA

**RE: RESEARCH AUTHORIZATION**

Following your application for authority to carry out research on *"adaption and Assimilation of Information Communication Technologies (ICTs), in Nyanza Province"*.

You are hereby authorized to undertake your research in selected districts in Nyanza Province up to 31<sup>st</sup> May 2010.

G. ATOBU KIRERA  
FOR: PROVINCIAL COMMISSIONER  
NYANZA PROVINCE

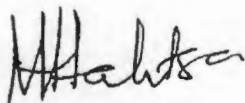
APPENDIX 7: RESEARCH AUTHORISATION, Ministry of Education, Kisumu,  
Kenya

Henry Ongori  
University Of North West  
SOUTH AFRICA

**RE: RESEARCH AUTHORIZATION**

Your application for authority to carry out research vide letter  
NCST/5/002/R/1055/7 refers.

You are hereby authorized to undertake your research in selected  
Districts in Nyanza Province up to 31<sup>st</sup> May 2010.



MARY ATALITSA  
FOR: PROVINCIAL DIRECTOR OF EDUCATION  
NYANZA PROVINCE