DECLARATION

I hereby declare that this research project is my original work and has not been presented for a degree award in any other university.

Signature..... Date 18/11/2011

RUTH WANJIRU WAWERU

REG. NO.: C50/70378/2007

This project proposal has been submitted with my approval as that project supervisor

Signature..... Date 19/11/2011

PROFESSOR EDWARD MBURUGU

DEPARTMENT OF SOCIOLOGY

FACULTY OF ARTS

UNIVERSITY OF NAIROBI

DEDICATION

This project is dedicated to my Lord and Saviour, Jesus Christ The Nazarene, who has divinely favoured me and continuously enabled me accomplish goals that are exceedingly, abundantly, above all I could ever ask or imagine.

"Not unto me, Lord, not unto me but to Your name be the glory, because of Your love and faithfulness" Psalm 115: 1

ACKNOWLEDGEMENTS

I thank the Lord God Almighty for protection, provision, intellect, health and wealth. This entire course would have not been possible without Your divine enablement. Thank you Jesus.

To my dear parents, Francis & Grace Waweru, words cannot express my gratitude for all the priceless treasures you have freely imparted in my life, one being the importance of education. I appreciate the sacrifices you willingly made to ensure that I become an empowered woman and a lighthouse in my generation. You are my guardian angels. May the Lord continue to bless you with extraordinary health, sorrow-free wealth and length of days.

To my husband, confidant and project editor, Mugumo Munene. Beloved, your selfless and noble actions throughout the pursuit of this entire course are the most radiant pages in the biography of my soul. Thank you for cheering me on even when I was most discouraged. I am especially grateful for the financial sacrifices you made, of being the sole bread-winner in our household, to enable me concentrate on this project. I am thankful for your intellectual contribution and the many hours we spent brain-storming on various aspects of this project. This is our victory.

To my siblings, Kiarie, Sue and Sam, you inspire me to continuously improve myself and be a better person. To my mum-in-law, Mrs. Anna Munene, thank you for your prayers and the sincere interest you took in my academic progression. To the entire Munene family Henry, Robert, Ruth, Peter and Joyce together with your families, thank you for your support.

I acknowledge with gratitude my project supervisor, Prof. Edward Mburugu, whose patience, guidance, encouragement, suggestions and constructive criticisms were instrumental in the success of this project. Your availability and dedication to your students, puts you a class above the rest. Special thanks also go to Prof. Mbatia, who freely shared his knowledge on ICT and trusted me with his books and other reading materials, for an extended period of time.

To the respondents in Kibera slum and any other person not mentioned, who positively contributed to this project paper, thank you for your time and contribution.

God Bless you all.

LIST OF FIGURES

Figure 2.1: Conceptual Framework

Figure 4.1: Gender Distribution

Figure 4.2: Age Distribution

Figure 4.3:Total Monthly Income

Figure 4.4: Number of Years Respondents Owned Mobile Phones

Figure 4.5: Terms of Purchase of Mobile Phone

Figure 4.6: State of Mobile Phone on Acquisition

Figure 4.7: Mobile Phone Ownership Status

Figure 4.8: Frequency of Communication via Mobile Phone with Various Social Groups

Figure 4.9: Extent to which Mobile Phone Adoption has Reduced Face-to-Face Interaction

Figure 4.10: Extent to which Mobile Phone Adoption Accrues Financial Benefits

Figure 4.11: Degree to which Mobile Phone Adoption has Increased Employment Opportunities

Figure 4.12: Innovation Unique to Kibera Slum Resulting from Mobile Phone Adoption

Figure 4.13: Ownership of Bank Accounts in Commercial Banks by Kibera Slum Residents

LIST OF TABLES

Table 4.1: Marital Status of Respondents

Table 4.2: Level of Formal Education Completed

Table 4.3: Period of Residing Within Kibera Slum

Table 4.4: Mode of Acquiring Mobile Phone

Table 4.5: Approximate Cost of Acquiring Mobile Phone

Table 4.6: Respondents Preferred Tariff

Table 4.7: Degree to which Various Factors Influence Acquisition of Mobile Phones

Table 4.8: Effects of Interaction via Mobile Phones on Various Social Aspects

Table 4.9: Degree to which Mobile Phone Adoption has Encouraged New Ventures

Table 4.10: Mobile Phone Related Businesses within Kibera Slum

LIST OF ABRREVIATIONS

CBK – Central Bank of Kenya

CCK – Communications Commission of Kenya

GoK – Government of Kenya

ITU – International Telecommunication Union

ICT – Information and Communication Technologies

KNBS – Kenya National Bureau of Statistics

MMS – Multi-Media Messaging Service

SMS – Short Messaging Service

ABSTRACT

Globally, Information and Communication Technologies (ICTs) have proved to be a key driver of socio-economic progress and development, enhancing productivity and therefore economic growth, reducing poverty and improving living standards in many ways. The mobile phone, specifically, has emerged as one of the most dynamic forms of ICTs in the 21st century. The diffusion and adoption of mobile phone technology and its applications is changing well established and traditional patterns of human interaction in many societies. In addition, this gadget has not only become a conduit for economic development in various sectors of the world's economy but also in the personal lives of its users.

The main objective of this study was to assess the impact of the adoption of mobile phone technology on of socio-economic development in urban slums. It was extrapolated from the reviewed literature and general observation. More specifically, the study sought to find out the impact mobile phone usage has on social interaction, premised on the promotion of socio-economic welfare, besides fostering entrepreneurship, within Kibera slum, in Nairobi County. The reviewed literature revealed various dynamics regarding the diffusion and adoption of mobile phone technology in low-income communities such as Kibera, and how these dynamics impact social interaction and entrepreneurship within these communities. The research design primarily took a mixed methods approach, where both quantitative and qualitative methods were incorporated in the research design, so as to augment the representativeness and validity of the findings.

Following the analysis of the study's findings, it was concluded that the adoption of mobile phone technology within Kibera slum, has indeed had a direct and positive impact on social interaction and entrepreneurship in the area. The study showed that resulting from the adoption of mobile phone technology, Kibera residents had become more social, had less conflicts at work and better relationships with their colleagues and children. They also felt safer and more secure and were able to reduce the number of times they traveled to their rural areas to visit relatives. When making the decision to purchase a mobile phone, Kibera residents, to a great extent valued brand, quality, ease of use and the availability of after-sale services. They were willing to spend between Kshs 4,000/= and Kshs. 9,000/= to acquire a handset, but preferred to do so on credit

and for a pre-paid tariff. They mainly used they phone to communicate with friends, family and colleagues and also for mobile money transfer.

The residents also said that they had benefited financially from the introduction of mobile phone. It was recommended that, to further encourage the rapid adoption of technology, stakeholders in the information and communication technologies sector should endeavour to introduce low-cost technologies, similar to the mobile phone, which foster development in low-income communities. Further, mobile phone service providers were urged to incorporate training on entrepreneurship into their corporate social responsibility. This training should be aimed at equipping entrepreneurs in urban slums, who sell mobile phone products or services, with knowledge and skills which will enhance their business productivity. Consequently, enhanced productivity will translate into better standards of living, increased employment opportunities and eventually, poverty reduction.

TABLE OF CONTENTS

DECLARATION.....i
DEDICATION.....ii
ACKNOWLEDGEMENTS.....iii
LIST OF FIGURES.....iv
LIST OF TABLES.....v
LIST OF ABBREVIATIONS.....vi
ABSTRACT.....vii

CHAPTER ONE.....4
INTRODUCTION.....4
1.1 Background of the Study.....4
1.1.1 An Overview of Kibera Slum in Nairobi.....6
1.2 Statement of the Problem.....8
1.3 Research Questions.....10
1.4 Objectives of the Study.....11
1.4.1 Broad Objective.....11
1.4.2 Specific Objectives.....11
1.5 Importance of the Study.....11
1.6 Scope and Limitations of the Study.....13

CHAPTER TWO.....14
LITERATURE REVIEW & THEORETICAL FRAMEWORK.....14
2.1 Introduction.....14
2.2 A Brief History of the Mobile Phone.....14
2.3 The Diffusion and Adoption of Mobile Phone Technology.....16
2.4 Mobile Phone Technology Applications in Kenya.....20
2.4.1 Voice Calls.....20
2.4.2 Short Messaging Service (SMS) & Multimedia Messaging Service (MMS).....21
2.4.3 Accessing the Internet.....21
2.4.4 Mobile Commerce (M-Commerce).....22
2.5 Social Interaction and the Mobile Phone.....24
2.5.1 An Overview of Social Interaction.....24
2.5.1.1 Types of Social Interaction.....25
2.5.2 The Impact of Mobile Phones on Social Interaction.....27
2.6 An Overview of Entrepreneurship.....30
2.6.1 Entrepreneurship and Mobile Phone Technology.....31
2.7 Mobile Phones in Low-Income Communities.....35

2.7.1 The Case of 'Favelas' in Rio De Janiero, Brazil 35
2.7.2 The Case of Grameen Telecom Village Phone (VP) Program in Bangladesh 38
2.8 THEORETICAL FRAMEWORK 40
2.8.1 Diffusion of Innovation Theory 41
2.8.2 Domestication of Information Communication Technology Approach 43
2.9 CONCEPTUAL FRAMEWORK 46
2.10 OPERATIONAL DEFINITION OF VARIABLES 48
2.11 HYPOTHESIS 49

CHAPTER THREE 50

RESEARCH METHODOLOGY 50

3.1 INTRODUCTION 50
3.2 RESEARCH DESIGN 50
3.3 POPULATION 51
3.4 UNIT OF ANALYSIS AND UNIT OF OBSERVATION 52
3.5 SAMPLE SIZE 52
3.6 SAMPLING DESIGN 52
3.7 SOURCES OF DATA 54
3.8 DATA COLLECTION TECHNIQUES 54
3.9 THE PILOT STUDY 55
3.10 DATA ANALYSIS AND PRESENTATION 55

CHAPTER FOUR 57

DATA PRESENTATION, ANALYSIS AND INTERPRETATION 57

4.1 INTRODUCTION 57
4.2 RESPONSE RATE 57
4.2 DEMOGRAPHIC INFORMATION 58
4.3 ANALYSIS & INTERPRETATION OF FINDINGS VIS-À-VIS THE RESEARCH OBJECTIVES 61
4.3.1 Factors Influencing the Adoption of Mobile Phones in Kibera Slum 61
4.3.1.1 Period of Ownership 61
4.3.1.2 Mode of Acquisition 61
4.3.1.3 Terms of Purchase 62
4.3.1.4 Costs Incurred in Purchase of Mobile Handset 63
4.3.1.5 State of the Phone on Acquisition 63
4.3.1.6 Preferred Tariff and Ownership Status 64
4.3.1.7 Factors Influencing Decision to Acquire a Mobile Phone 65
4.3.2 VARIOUS USES OF THE MOBILE PHONES IN KIBERA SLUM 65
4.3.3 EFFECTS OF MOBILE PHONES ON VARIOUS TYPES OF SOCIAL INTERACTION IN KIBERA 66

4.3.3.1 Frequency of Mobile Phone Communication within Social Groups 66
4.3.3.2 Effects of Adoption of Mobile Phones on Interaction in Kibera 67
4.3.3.3 Effects of Mobile Phone Adoption on Face-to-Face Interaction 68
4.3.4 The Mobile Phones Influence on Innovation and Job Creation in Kibera Slum 69
4.3.4.1 Financial Benefits Accruing from the Adoption of Mobile Phones 69
4.3.4.2 Mobile Phone Adoption and New Ventures within Kibera Slum 70
4.3.4.3 Mobile Phone and Employment Opportunities within Kibera Slum 71
4.3.4.4 Mobile Phone Adoption and Innovations Unique to Kibera Slum 71
4.3.4.5 Mobile Phone and Ownership of Bank Accounts by Kibera Residents 72
4.4 Summary of Findings from Key Informant Interviews 73
4.5 Data Collection Challenges 74
CHAPTER FIVE 75
SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS 75
5.1 Introduction 75
5.2 Summary of Findings and Conclusions 75
5.3 Recommendations 79
5.4 Suggestions for Further Studies 80
APPENDIX 1: STRUCTURED QUESTIONNAIRE 87
APPENDIX 2: KEY INFORMANTS QUESTIONNAIRE 87
REFERENCES 88

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Globally, information and communication technologies (ICTs) have proved to be a key driver of socioeconomic progress and development, enhancing productivity and therefore economic growth, reducing poverty and improving living standards in many ways. ICTs in this case include telecommunications, internet and business process outsourcing (BPO), broadcasting and postal services. ICTs are increasingly revolutionizing production processes, access to markets, and information sources together with social interactions. ICTs also have an impact on government efficiency and transparency (CCK, 2010).

The mobile phone, specifically, has emerged as one of the most dynamic forms of ICTs in the twenty-first century. The rapid global spread and mobility of cellular telephony have challenged the growth rate of prior communications devices to become the technology of choice for people in most countries of the world. These increasingly versatile, miniaturized gadgets can be found in urban communities in the developed and underdeveloped regions, even given continuing gaps in income and access (Ahonen, 2007).

The growth in usage of mobile phones in Africa has expanded opportunity for business, social and educational transactions. Ford and Batchelor (2007) state that mobile phone technology has grown in sophistication, expanding functionality more than could have been possible a decade ago. For instance, the ubiquity of web-enabled mobile phones has transformed them into computer terminals. A wealth of other electronic services and resources are now available to the mobile user. It is through this enhanced usability that mobile phones are opening up possibilities in Africa. Etzo and Collender (2010) concur with the foregoing by stating that only superlatives seem appropriate to describe the mobile phone revolution, its impact and its potential, in Africa. Mobile phones are almost always the cheapest and quickest way to communicate, particularly when fixed-line phones and broadband internet are underdeveloped and dependent upon expensive infrastructure. The ubiquity of mobiles is matched only by the ingenuity of their users. From shanty towns to remote villages, mobile phones are being used to transfer money, monitor

elections, and deliver public health messages. A large informal economy has also emerged to support the mobile sector, with people selling airtime, charging and fixing mobiles, and renting them out. Africa is truly a crucible for mobile phone innovation and entrepreneurship.

In Kenya, the mobile telephony quickly penetrated the so-called upper classes, through to the middle class, and more gradually down to the low-income groups. This pattern of diffusion has generated on-going analysis of the impact of the mobile phone on different social strata. These approaches range from the extremes of technological determinism which view technological innovations as being capable, by themselves, of transforming society, to techno-skeptics such as Postman (1993), to social determinists like McLuhan (1964) and DeKerckhove (1995) who view technology as socially defined extensions of human capacities with the potential of enabling a wide range of economic and social opportunities. Simply put, technologies are constantly reevaluated by users and given new functions.

The mobile phone is emerging as a social enabler of opportunities by virtue of its mass accessibility, portability and range of applications. From this perspective, this study embraced the viewpoint that the mobile phone is conceivably the seventh mass media channel. Like the internet before it, today the phone can replicate everything the previous six mass media can do (Ahonen, 2007). Diffusion of mobile telephony in the last decade has had a strong social and economic impact by being instrumental in raising prosperity and reducing poverty in developing countries (Dutta & Mia, 2008). It has worked to reduce the digital and economic divide existing between high and low-income countries (Porter & Schwab, 2009). This has been driven by: acceptance of the technology in the developing world; an infrastructure that is fairly easy to deploy; a market that is generally open to new entrants; and the decreasing costs of mobile handsets and communication services. The technology has also led to introduction of innovative, competitive and customized products such as mobile banking and mobile money transfer services.

Of all the ICT services, mobile telephones have increasingly become the dominant service that is accessible to many people, irrespective of their physical location. The International Telecommunication Union (ITU) estimated that by the end of 2007, there would be over 3.1 billion mobile subscribers in the world, compared to 1.3 billion fixed telephone lines (ITU,

2008). The same ITU data indicated that over 60 million new mobile telephone subscribers joined the mobile telephone family in Africa in 2007. Africa has been one of the fast growing markets for mobile telephones and this has made the technology prominent on the continent.

Technological development and business innovations are making mobile telephones strategic technologies for boosting business development, thus moving away from being a tool for only voice communication. For example, mobile telephones now provide multi-purpose platforms for services such as internet connectivity, e-banking, and e-commerce among others (Frempong *et al.* 2007). Using technologies such as General Packet Radio Service (GPRS), high speed 3G technology popularly known as EDGE, Code Division Multiple Access (CDMA), and Universal Mobile Telecommunications Service (UMTS) among others, internet services are now provided via mobile telephones and this has the potential of increasing access to internet services. Companies in the Philippines, Kenya, Tanzania and South Africa have developed mobile telephone platforms that support a number of e-financial services through the mobile telephone handset. Consequently, it has become versatile, offering significant business benefits to enterprises. These innovations and their applications are increasingly contributing to business competitiveness, as well as developing new business models whose impacts are enormous. Invariably these have impact on economic growth, and according to Waverman *et al.* (2005), the growth is very significant in developing countries.

The importance of mobile telephones to African countries is enormous and has been summarized as: an infrastructure service to improve efficiency of markets, promote investment, reduce risk of disasters and contribute to empowerment; an economic sector where mobile telephone operators can make big profits, and pay taxes; a development tool for innovative applications to increase efficiency of service delivery or opened opportunities for new services (Scott *et al,* 2004: Pg. 44-59); and access to the market for informal operatives (Gough and Grezo, 2005).

1.1.1 An Overview of Kibera Slum in Nairobi

UN-HABITAT (2007) defines a slum household as a group of individuals living under the same roof in an urban area who lack one or more of the following: Durable housing of a permanent nature that protects against extreme climate conditions, sufficient living space which means not more than three people sharing the same room, easy access to safe water in sufficient amounts at

an affordable price, access to adequate sanitation in the form of a private or public toilet shared by a reasonable number of people, security of tenure that prevents forced evictions. Not all slums are homogeneous and not all slum dwellers suffer from the same degree of deprivation. The degree of deprivation depends on how many of the five conditions that define slums are prevalent within a slum household. Kibera is located five kilometers from the Nairobi city centre and it lies at an altitude of 1,670m above sea level, latitude 36 degrees, 50° east and longitude 1 degree, 17° south about 140 km south of the equator (Karanja et al, 2002). In reality it is a sprawling slum that differs little from the other lower-class enclaves surrounding Nairobi. It is a place of over-crowded, substandard housing with unreliable water, poor sanitation and minimal social services (Parsons, 1997).

Harding (2002) explains that Kibera's history goes back to colonial period when the urban layout was based on government-sanctioned population. This was the era of racial segregation that separated people into the enclaves for Africans, Asians and Europeans. As an informal settlement, Kibera dates back to the 1920s when the British colonial government decided to let a group of World War II Nubian soldiers from Sudan to settle on a wooded hillside outside Nairobi. The British colonials then failed to repatriate the Nubians to their country or to compensate them with land title deeds to these acquired lands from the Kenyan people. Nubians built homes and set up businesses while they were still squatters with no legal rights. They called the place Kibera, meaning forest.

Mulumba et al (2004) points out that even though Kibera is not an official settlement people have to pay rent, and this often collides with the decision of rather buying food for that money. KNBS (2010), during the 2009 population and housing census, noted that the slum is sub-divided into seven villages/areas. These include Kibera, Lindi, Makina, Siranga, Laini Saba, Gatwikira and Kyanda with a total population of 170, 078. This was contrary to previous reports from various bodies, including the UN, which had grossly over-estimated the population of Kibera slum to be slightly over 1 million.

The growth of Kibera as an informal settlement is closely connected with Nairobi city's phenomenal growth. Life there is a daily struggle with poverty, crime, and diseases. Many Kibera residents work in Nairobi's industrial sector for wages near $2 per day. One household,

consisting of an average of five people, generally occupies a ten square meter single room without plumbing or a sewer system. (Schuringa,1997). Mitullah (2003) points out that, Nairobi slum residents generally have a high unemployment rate. The income that does come in is mostly from informal economic activities such as hawking food and clothing, although some have formal employment as mentioned above. Other common problems in Nairobi slums are that social services to slum dwellers are neglected, high unemployment and livelihood insecurity promoting alcohol and drug abuse and consequently a high HIV rate of infection.

In light of the aforementioned, it can be deduced that communication is essential for information flow including information pertaining to development programs. This includes awareness enhancement to the populations. GoK and UNHABITAT (2005) found that the modes of communication and information flow identified in the area were mobile phones, public phones popularly referred to as 'simu ya jamii', telephone bureaus, radios and televisions, loudspeakers, posters, public forums referred to as 'barazas', announcements and word of mouth. The report suggests that in the slum upgrading programme the most effective mode of communication and information flow should be provided, so that information reaches to all intended as fast as possible. Use of cell phones should therefore be embraced. Both private and public sectors should be involved in the provision of communication infrastructure depending on the suitability of each sector.

1.2 Statement of the Problem

Technology advances in recent years made available mobile telecommunications services at an unprecedented rate. The introduction of digital technology as well as a more liberal stance on licensing of technology and the liberalization of telecommunications has led to the fast diffusion of mobile phones. The relative ease of access and the flexibility it provides in communication has resulted in mobile telephony being the preferred means of communication not only for social, but increasingly for business activities. Its popularity in most African countries has been fuelled by the poor penetration of fixed line networks. According to the BEACON Project (2005), in the late 1990s an important shift occurred in communications: the number of mobile phones overtook the number of landlines and a new era of mobility was ushered into telephony

Despite saturation in the circulation of mobile phones in the society, researchers have only begun to analyze the social consequences of their adoption: changing patterns in communication and in the organization (King, 2008), co-ordination and conduct of social and economic relations (Carroll et al, 2007), evolving modes of access to and consumption of information and media services (Murtazin, 2004), and the declining constraints of space and time in communication. Further, the mobile phone has been aligned to policies to ease digital and social divides (Murtazin, 2004; Castells, 2000). The European Commission has identified 3G mobile as a means of achieving greater inclusion in the information society than so far has been possible with the personal computer and fixed broadband (Reding, 2006). However, no study has been done on the effect of wireless internet, money transfer, mobile phone communication and mobile banking in enhancing entrepreneurship and greater social networks within slums in Kenya

Drawing on the sociology of technology, a significant strand of research on the mobile phone has been conducted within a broad conceptual framework of domestication and the social shaping of media technologies. The research, which has highlighted the processes of social learning involved in the appropriation of a new technology, has also tended to be carried out in the societies in which the mobile phone is most deeply embedded: the developed world. Some of the work dates back to the early 1990s, when mobile phone usage was uncommon, usually confined to specific social groups, and the technological device itself was cumbersome and unreliable (Skog 2002; Rosenlund 1992). Since then, social usage of the mobile phone has evolved from being a novelty to being taken for granted.

Despite Kibera appearing to be a slum in a state of socio-economic decay, there are significant and continuous development activities carried out, such as the slum upgrading projects by the government and various non-governmental organizations, aimed at reducing poverty. De Souza e Silva (2008), who researched on the mobile phone usage in the 'favelas' (Brazilian for slum) of Rio De Janiero in Brazil, found that despite poverty, slum residents were indeed acquiring mobile phone handsets but had different uses for the gadget, owing to the security and privacy issues within the slums. Additionally, she also found that the slum residents preferred pre-paid phones and mainly used the phone's basic functions. Kibera slum and the 'favelas' in Rio are somewhat similar, considering that they are both urban slums in developing countries, located close to affluent neighbourhoods and central business districts. In light of this, the study found

Kibera slum an appropriate place to carry out this research considering that it is the largest urban slum in Kenya and the findings of this study may be used to promote development programs, not only within Kibera, but also other urban slum within the country.

Social science research on mobile communications has evolved because an expanding set of demographics, such as low-income communities, has embedded mobile phones into a wider range of activities in everyday life. Nevertheless, compared to the strong attention from academia and government on the effects of personal computers and internet diffusion and adoption, the mobile phone and its social consequences have been relatively neglected (Rice & Katz, 2003). Furthermore, the greater part of research, with regard to the mobile phone, has focused on its commercial rather than its social aspects. The existing research has not sufficiently and scientifically looked into the social and economic impact of new ICT within slum areas. The foregoing proved that there was a knowledge gap in the assessment of the impact of mobile phone technology, as an agent of socio-economic development within urban slum areas.

This study therefore sought to bridge the abovementioned knowledge gap by analyzing the impact of mobile phone technology on socio-economic development in urban slums, with specific reference to mobile phone users within Kibera Slums, Nairobi County. To further enhance the specificity, the study focused on assessing the impact that mobile phone technology has had on social interaction, premised on the promotion of socio-economic welfare, besides fostering entrepreneurship.

1.3 Research Questions

i. What factors have influenced the adoption of mobile phone technology within slum areas?

ii. What are the most common uses of mobile phone technology in slum areas?

iii. How has the adoption of mobile phone technology influenced social dynamics within slum areas?

iv. Has the adoption of mobile phone technology had any bearing on entrepreneurship within slum areas?

1.4 Objectives of the Study

1.4.1 Broad Objective

The main objective of this study was to establish the social and economic impact that usage of mobile phone technology has had on the residents of Kibera slum, within Nairobi County.

1.4.2 Specific Objectives

This study sought to achieve the following specific objectives:

i. To establish the factors influencing adoption of mobile phone technology within Kibera slum.

ii. To identify the various functions of the mobile phone within Kibera slum.

iii. To determine the effects that mobile phone usage has had on various types of social interaction within Kibera slum.

iv. To find out how the adoption of mobile phone technology has influenced innovation and job creation within Kibera slum.

1.5 Importance of the Study

Slum areas in Kenya are a poor image of the development of the country's main cities: Nairobi, Mombasa and Kisumu. This is because the slums are characterized by unplanned settlements and overcrowding. Much has been said about these slums and numerous studies conducted on various aspects but little has been done. However, the findings of this study brought to light the extent to which mobile phone technology has been adopted by the inhabitants of the largest slum in Kenya and how this innovation can be used to bring social, economic, cultural, environmental and political development in the area and other slums within the country. The challenges of implementing the remedies to various problems that previous studies of Kibera have recommended, could finally be overcome via mobile phone technology. This could eventually raise the standard of living of slum dwellers and eventually reduce the number of Kenyans living below the poverty line in the area.

This study will be of benefit to the Government of Kenya because it will give them insight on various issues pertaining to information and communication technology and development within the country. More specifically, the Ministry of Information and communications and the Communication Commission of Kenya (CCK), both whose mandate is to facilitate ICT development in Kenya, will be the principal beneficiaries of the findings of this study. Secondary beneficiaries would include the Ministry of Planning, National Development and Vision 2030 who's mandated to facilitate and coordinate the national development planning process. The Ministry of Nairobi Metropolitan Development will also gain from this study considering that one of its main functions is to avail a framework for sustainable urbanization through providing capacity for regional and urban planning, provision of adequate housing for all, replacement of slums with affordable housing, improving and enhancing proper infrastructure and sanitary facilities. The above mentioned government bodies will be able to derive information from this study that will assist them in policy formulation and implementation with regard to ICT and slum upgrading.

The ICT sector, both private and public, may use the findings of this study to increase the penetration of their products within slum areas by designing products which address the specific needs of those living there. They will also be able to formulate marketing strategies which will best appeal to the inhabitants if various slums within the country. Non-Governmental Organizations the United Nations (UN), The United States Agency for International Development (USAID), World Health Organization (WHO), World Vision, Plan International amongst others, may use this study to formulate policies that will enable them fulfill their mandates via ICT. These organizations may use ICT to communicate to the slum inhabitants concerning important issues such as health and sanitation, child and mother mortality, HIV/AIDS awareness, education, nutrition, economic empowerment and human rights.

The study will also be useful to scholars by providing them with empirical information which adds to the general body of knowledge regarding ICT and its adoption. Moreover, its findings may bring out new knowledge gaps which will provide scholars with the opportunity to carry out further research, thereby adding to the existing body of knowledge.

1.6 Scope and Limitations of the Study

This study was exploratory in nature. Its scope was limited to a target population of mobile phone users within Kibera slum in Nairobi County. The study also focused solely on mobile phone technology and did not dwell extensively on any other form of information and communication technology. Furthermore, the study specifically looked into the dynamics that the usage of mobile phone technology has introduced into social interaction while nurturing entrepreneurship, within Kibera slum.

CHAPTER TWO

LITERATURE REVIEW & THEORETICAL FRAMEWORK

2.1 Introduction

This chapter was dedicated to the review of the general body of specific and empirical knowledge relating to mobile phone technology, its origin and evolution over the decades, its diffusion and adoption in Africa, Kenya and low-income communities and its most predominant uses within these communities. The literature reviewed generally focused on the relevance of the mobile phone within low-income communities, owing to the fact that slums such as Kibera are categorized under this social class. An overview of how this technology has influenced the major socio-economic variables under study, that is social interaction and entrepreneurship, followed. To conclude the chapter, the relevant theories were evaluated and a conceptual model derived, in line with the arguments emanating from the literature reviewed.

2.2 A Brief History of the Mobile Phone

Contemporary mobile telephony is an offshoot of the more general development of radio communication that started in the late 1800 (Ling, 2004). According to Agar (2003) Swedish electrical engineer, Las Magnus Ericsson, greatly contributed to the existence of the mobile phone as we know it today. Ericsson, in 1876, was the first to manufacture and repair telegraph apparatus and later, following Alexander Graham Bell's invention, the telephone. In the course of his retirement in 1910, Ericsson built a telephone into his wife's Hilda's car. The vehicle was connected by wires and poles to the overhead telephone lines that had sprung up even in rural Sweden. Although this mobile phone was in sense just a toy, it did work. Agar (2003) continues to explain that although no great industry of car-carried mobile phones was founded by the experiment, it was significant in many other ways because after many twists and turns, Ericsson's company would supply much of the infrastructure for the cellular phone systems built in the late 20th century.

Guglielmo Marconi, an Italian inventor, also contributed to the advent of mobile phone technology, via the invention of the radio telegraph. Ling (2004) highlights that through the 1890s, Marconi sent radio signals over progressively longer distances, ranging from several hundred meters to several hundred kilometers and eventually to transoceanic communications.

He further states that by 1899, Marconi was able to equip two ships with radio transmitters in order to report the progress of the American Cup. Two years later, he successfully sent a radio message from Cornwall, England to Newfoundland, Canada. This made marine communications one of the first areas of truly mobile radio-based communication (Grimstveit & Myre, 1995 as quoted by Ling, 2004). The growth of radio communication was further aided by Lee De Forest, an American inventor who developed in 1906, a vacuum tube which facilitated the amplification of relatively weak electrical signals. Vochin (2009) concurs with the foregoing by saying that mobile phone technology is basically an very advanced and automated type of radio technology, more specifically, the two-way radio.

Ling (2004) remarks that the development of the transistor in the Second World War, led to the next significant development in mobile telephony, namely, the regular use of radio telephony for switched communications. From the late 1800s, landline telephony had offered person-to-person communication vie switched circuits. A dedicated circuit or 'line' was set up between two persons calling each other. The early 'switches' were simply manual devices where the operator who the calling party wished to reach and then connected the two with the use of a cable or jack. Ling (2004) further reveals that these switches were progressively automated until switching systems are now largely electronic devices that can handle many thousands or even millions of simultaneous conversations.

One of the greatest hindrances to the development of the mobile phone as we know it today was the size of the battery, which at first needed to be carried in the trunk of a vehicle. However, the advances made in battery technology over the years, has enabled mobile phones to be comfortably carried in shirt pockets and bags. The batteries have not only become more powerful, they have also become smaller. Agar (2003) notes that the great Prussian physicist, Walter Hermann Nernst, also contributed to the development of mobile phone technology when in 1899, he experimented with nickel as a means of converting chemical energy into electrical energy. This experiment eventually led to today's Nickel Metal Hydride (Ni-MH) battery, which in one sense is recognizably similar to Nernst's but is many times lighter and more efficient.

Fast forward to mid-20th century when according to Vochin (2009) the first fully automatic mobile phone system called MTA (Mobile Telephone system A), was developed by Ericsson and commercially released in Sweden in 1956. The system required no manual control, but yet again

the issue of the equipment's weight (around 40 kilos) was an encumbrance to its portability. However, things changed dramatically with the arrival on the market of the Motorola Dyna 8000X, which was one of the first phones that could really be carried around easily, without requiring a briefcase (or worse) in order to do. This was referred to as the 1G, first generation, mobile phones and network. These were first available in Japan, then some of the Nordic countries and later on, USA. This was further developed to 2G (second generation), 3G (third generation) to the most current 4G (fourth generation) mobile phone and networks.

The 1980s saw increasing interest in the development of various mobile telephony standards. However, the Nordic Mobile Telephone (NMT) in Europe was the first generally successful cellular system that automated the calling process and allowed for international roaming. It was a standardized system where one could use the same mobile telephone across the Nordic region. Nonetheless, it was still a parochial system and was incompatible with similar systems in other countries such as the United Kingdom and France. This incompatibility led the European public network operators, in conjunction with the European communities and The European Telecommunications Standards Institute, to develop the Global System for Mobile Communications (GSM). The GSM technology allows for international roaming, is backward compatible with other systems, allows for various national tariff systems and includes the ability to send and receive various data-based services such mobile internet and Short Message Service (Ling, 2004).

Developments in the industry clearly point out to the fact that mobile phones are here to stay, although it's still hard to predict what direction they'll eventually take. Thus, the most plausible scenario is that mobile phones will slowly turn into tiny, ultra-portable computers, able to carry out a huge array of functions besides voice communication. In the near future, we might witness a complete overhaul of this concept and the first signs of things to come being already here as evidenced by the Smartphone, iPhone and more recently, the Android operating system for mobile phones.

2.3 The Diffusion and Adoption of Mobile Phone Technology

According to Mabogunje (1980) developing countries viewed their underdeveloped counterparts as a product of causes internal to the various countries concerned. To help these countries out of

the vicious cycle of poverty, ignorance and disease, the developed countries, out of a feeling of common humanity of 'enlightened self-interest', were persuaded to extend assistance in the form of technical expertise, loans and credit. They also offered to train local entrepreneurs, technicians, managers and industrial workers. Such assistance was important since development was conceived of as resulting from innovations and changes generated in the developed countries and diffused to underdeveloped ones. These innovations were introduced into the metropolitan centers of underdeveloped countries, from where they were further diffused into rural areas. Such diffusion was assumed to be beneficial in its effect, serving to modernize the whole country and to raise the level of the backward periphery to that of the central region.

Barros & Cadima (2001) point out that, technological advances in recent years made available mobile telecommunication services at an unprecedented scale. The introduction of the digital technology as well as a more liberal stance on spectrum licensing has led to a fast diffusion of mobile telephones. Hall & Khan (2003) help us understand the diffusion of technology more clearly by describing it as the cumulative or aggregate result of a series of individual calculations that weigh the incremental benefits of adopting a new technology against the costs of change, often in an environment characterized by uncertainty (as to the future evolution of the technology and its benefits) and by limited information (about both the benefits and costs).

Castells et al (2007) as quoted by Shrum et al (2011) notes that mobile telephony has diffused more rapidly than any technology in the history of sub-Saharan Africa. As the developed world achieved almost universal connectivity with near perfect reliability, Africa had neither, remaining a region where phones were scarce and dysfunctional. For Western observers to appreciate this phenomenon, what is crucial is that working landlines were not rare simply in small villages. Even in a major urban area such as Nairobi, telephones were expensive and dysfunctional. Western visitors, ringing a landline persistently, were often surprised to find that it had been switched off for some times connections mysteriously disappeared for large areas of the city. Cell phones do allow their users mobility, but the astonishing rate of diffusion in the developing world owes more to the fact that they provide connectivity, often for the first time. Now, shortly after their introduction, the number of mobile phones exceeds the number of fixed lines by a substantial margin in many countries.

Barros and Cadima (2001) agree with the foregoing by implying that in response to the introduction of the cellular phone technology, a slowdown in fixed-link penetration is expected. New generations of consumers entering the market perceive no advantage of the fixed-link over the cellular technology. In fact, the mobility associated with the latter gives a clear advantage at consumers' eyes. Thus, a negative impact is anticipated. This is supported by ITU (2009) which asserts that the high ratio of mobile phone subscriptions to fixed telephone lines, the highest of any region in the world and the high mobile cellular growth rate suggest that Africa has taken the lead in the shift from fixed to mobile telephony, a trend that can be observed worldwide. Between 1998 and 2008, African added only 2.4 million fixed telephone lines, less than 1% of the telephone lines added globally in the same period. According to ITU (2009) the penetration rate of mobile technology in Africa is still considerably lower than in other regions, nonetheless and over time, mobile cellular subscriptions have become more evenly distributed across the continent. This is illustrated by the situation in South Africa which, in 2000, accounted for 74% of Africa's mobile cellular subscriptions. Yet by 2008, only 19% of Africa's mobile subscriptions were located there. Though the growth in Nigeria is most notable, other countries including Kenya, Ghana, Tanzania and Côte d'Ivoire have also greatly contributed to the change in the distribution of mobile cellular subscriptions in the region.

Hall & Khan (2003) further claim that the contribution of new technology to economic growth can only be realized when and if the new technology is widely diffused and used. Diffusion itself results from a series of individual decisions to begin using the new technology, decisions which are often the result of a comparison of the uncertain benefits of the new invention with the uncertain costs of adopting it. Unlike the invention of a new technology, which often appears to occur as a single event or jump, the diffusion of that technology usually appears as a continuous and rather slow process. Yet it is diffusion rather than invention or innovation that ultimately determines the pace of economic growth and the rate of change of productivity. Until many users adopt a new technology, it may contribute little to our well-being.

The Global Information Technology Report (2008/09) affirms the above by reporting that diffusion of mobile telephony in the last decade has had a strong social and economic impact. The technology has proven instrumental in raising prosperity and reducing poverty in developing

countries. It has worked to reduce the digital and economic divide existing between high and low-income countries (Global Competitiveness Report, 2008/09). This has been driven by: acceptance of the technology in the developing world; an infrastructure that is fairly easy to deploy; a market that is generally open to new entrants; and the decreasing costs of mobile handsets and communication services. The technology has also led to introduction of innovative, competitive and customized products such as mobile banking and mobile money transfer services (Global Information Technology Report, 2008/09). The International telecommunication Union (2009) affirms this by reporting that two thirds of the world's mobile phone subscriptions are in developing nations, with the strongest and continued rate of growth in Africa, where a quarter of the population now has a mobile phone. It is further noted that between 2003 and 2008, Africa's mobile phone subscriptions grew twice as fast as that of the world.

In light of the foregoing and supported by statistics published by the CCK in their Quarterly Sector Statistics Report for the third quarter of 2010, as shown hereunder, this study can confidently state that mobile phone technology is well diffused in Kenya. The CCK quarterly report found that by the end of September 2010 mobile phone subscriptions had grown by 9.5 % from 20.1million in the last quarter to 22 million subscribers. This is the highest growth that had been recorded over the other quarters of 2010. This was a tripling of subscriptions since 2006 which recorded subscriptions of 7.3 million. The same report also highlighted that the mobile penetration rate had risen to 55.9% by the end of the same year (CCK, 2011). The Central Bank of Kenya's FinAccess Report (2009) also found out that there was greater uptake of mobile phone technology in urban areas of 72.8% and more specifically in Nairobi, an uptake of 80.4%. In a country of well over 38 million people, we can claim that mobile phone technology is well penetrated. This rapid diffusion of the mobile phone can be explained by, among other things, the drop in the price of mobile handsets to within reach of those with low incomes and the drop in mobile tariffs as a result of stiff competition between the four mobile phone operators namely Safaricom, Airtel, Orange and Yu, as well as the low cost of prepaid calling cards. With competitive pressure likely to remain intense among the four service providers, growth in subscriptions is expected to continue (CCK, 2010).

Gikenye and Ocholla (2010) noted that the rapid diffusion of mobile phones was accelerated by the fact that they require only basic literacy to use and thus making them accessible to a larger proportion of the population, particularly low-income, small business traders. In addition, they are easy to use and adaptable - for those without electricity, phone charging kiosks have quickly come up in small towns and shopping centers while solar-powered phones have also been introduced onto the market. The relatively high user-friendliness and affordability of mobile phones have made it possible for low income micro and small enterprise traders, who are also referred to as the informal or 'Jua Kali' sector in Kenya, to adopt and use them widely. It is therefore agreeable when Aker and Mbiti (2010) remark that mobile telephony has brought new possibilities to the continent, Kenya included, across urban-rural and rich-poor divides, mobile phones connect individuals to individuals, information, markets and services.

The mobile telephone is more than simply a technical innovation or a social fad. The examination if its adoption and use and of the attitudes associated with the device provides insight into some of the broader machinations of society. It is being used to coordinate peoples' everyday lives. It's being used to chat, send texts and pictures messages, call sick aunts, organize parties, to build relationships by lovers who send endearments to each other, to buy and sell by businesspeople, by traders to keep track of their assignments, to surf the internet amongst many other uses (Ling, 2004).

2.4 Mobile Phone Technology Applications in Kenya

The four mobile phone service operators in Kenya, Safaricom, Airtel, Orange and Essar's Yu, have developed different services to meet the unique circumstances of the society and boost mobile uptake and usage.

2.4.1 Voice Calls

The most prevalent of the applications is voice calls. CCK (2011) reports that during the third quarter of 2010, a total of 6.63 billion minutes of local calls were made on the mobile networks against 6.05 billion in the previous quarter, representing 9.6 per cent increase. All the service providers mentioned above provide this service, on either pre-paid terms (the user tops up airtime in an account by purchasing a recharge voucher prior to use) or post-paid terms, where the user is billed monthly (www.safaricom.co.ke). Some service providers have additional benefits of international calling, roaming when one has travelled overseas, voicemail, 24 hour

customer, information services and loyalty schemes. These services vary from provider to provider.

2.4.2 Short Messaging Service (SMS) & Multimedia Messaging Service (MMS)

This service enables subscribers to send and receive text messages, charged per 160 characters. When an SMS is received it is stored in your mobile phone. It's quick, convenient and affordable and allows you to get the message across secretly and silently. Text messages are ideal when it is difficult to talk in crowded or public places, when you are in meetings, when you just want to send a quick note, arranging meeting, organizing your social life and receiving short updates on news, entertainment, sports, horoscopes, Bible verses and quotes. They are also come in handy when you don't want somebody else to hear what you're saying (www.safaricom.co.ke)

CCK (2008) notes that the use of SMS has increased over the period of 2008, which may be attributed to among others, the low cost of sending SMS, and increased use of SMS for social and commercial information dissemination. They reveal that an aggregate of 445,141, 504 were sent in 2007 alone. ITU (2009) underscores this by stating that text messaging is an area being used to enhance customer satisfaction. In Kenya, mobile operator Safaricom offers the "Flashcom 130" service which provides an alternative to calling someone, and letting their mobile phone ring just long enough to know they should call back (so-called "flash calling"). Flashcom 130 allows users to send a free text message asking for someone to call.

2.4.3 Accessing the Internet

Over the last decade, internet usage has greatly increased in Africa, and together with the mobile cellular market, the internet market represents an important area of ICT growth and development. The internet is now recognized not only as a source of information, but also as having the potential of a significant development enabler, with its many applications, and making it particularly important for Africa (ITU, 2009). It's worth noting that mobile internet services are currently priced much cheaper than fixed dial-up internet services. Mobile dial-up Internet is priced very differently from the fixed dial-up internet. In this case, mobile operators charge customers for the data received or transferred and not the duration of the call. This is a big advantage especially considering that dial-up internet speeds are low and also more costly (CCK and Netcom Information Systems, 2007).

CCK and Netcom Information Systems Limited (2007) further point out that until 2005, only Internet Service Providers (ISPs) could offer internet services. However, the situation has changed since CCK issued a new licensing framework in late 2004 after the Telkom Kenya Limited's monopoly came to an end in June 2004. For example, two Internet Backbone Gateway Operators were licensed in December 2004 and Telkom Kenya, through its subsidiary Jambo Telkom, moved into the Internet market in 2005/2006. Dial-up mobile internet services were introduced by Kencell (now Airtel) in early 2001 but were expensive because of the per-minute mobile charges. In the period 2005-2006, the mobile operators introduced mobile internet services using GPRS and EDGE technologies and with flat volume-based pricing. This has increased the number of Mobile internet customers from zero in 2001 to over 250,000 by 2006. The study established that this number was higher than the total number of fixed dial-up internet customers in the country in 2006. It is likely, that the growth of internet services in Kenya will follow the growth of mobile telephone services. The websites of the four mobile phone operators in Kenya all indicate that they offer mobile phone internet services and all one needs is a GPRS-enabled mobile phone.

As at 2006, Nairobi had the lion's share of over 80% of the internet customers. The Coast province was a distant second with about 9% of the customers. Indeed Nairobi and the Coast province accounted for about 90% of all internet customers. Eastern, Western and North Eastern provinces have the lowest number of internet customers in respective decreasing order, with the last two having a negligible percentage. The study predicts that the dispersion of internet users will follow the same pattern over the years. It warns that if these disparities are not addressed, they are likely to lead to a worse digital divide and national socio-economic disparity. It recommends that CCK takes a strategy to address the above huge regional disparities, especially through a revised universal access/service strategy (CCK and Netcom Information Systems, 2007).

2.4.4 Mobile Commerce (M-Commerce)

Mobile cellular phones are also increasingly being used for local m-commerce applications, such as pricing information for rural farmers, banking, fund-raising for various projects and paying for goods and services. These commercial applications are increasing at an unprecedented rate,

much to the delight of mobile phone users. The most popular, evolutional and socially innovative of these applications is mobile banking (M-banking).

In a region where a significant part of its inhabitants have a mobile cellular telephone but do not have a bank account, there is a huge opportunity to bring financial services to a largely untapped consumer base. Mobile operators have acknowledged this opportunity and have launched several m-banking services. Some international initiatives to support ICT for development projects have been launched, such as the Mobile Money for the Unbanked (MMU) programme. The most successful m-banking experience up-to-date is the M-PESA (mobile money) system, launched by the Kenyan mobile operator Safaricom in conjunction with Vodafone in March 2007. It allows subscribers to use their phone as a virtual bank by depositing and withdrawing funds through the value stored on their mobile phone (ITU, 2009). Currently, mobile money transfer can also be used to pay for utility bills such as electricity, water, cable television, insurance, household shopping, church tithes and offerings, donations to charity, medical bills, salaries and school fees amongst others. The other three mobile phone service providers have since established mobile money transfer services, namely Airtel's ZAP, Orange Telkom's Iko Pesa and Yu's YuCash, however, the most dominant is Safaricom's M-Pesa, with a client base of 13, 341, 387 by the end of December 2010 (Safaricom, 2011). It is with this in mind that I choose to focus specifically on M-Pesa to expound further on mobile money transfer.

Simply put, M-Pesa, Safaricom's Limited mobile money transfer service is a technological innovation with a high level of uniqueness. It is an innovative mobile payment solution that enables customers to complete simple financial transactions such as person to person transfers, payment of utility bills and buying mobile phone airtime by using the short messaging service (SMS) technology. It is aimed at mobile phone customers who do not have a bank account, either by choice, because they do not have access to a bank or because they do not have sufficient income to justify a bank account. It is convenient, secure and easy to use; moreover, the pricing is competitive compared with other formal money transfer services. M-Pesa clients can withdraw and/or deposit electronic money from any of Safaricom's authorized agents with one or more outlets around Kenya. Potential M-Pesa users can also register as customers at these outlets (Safaricom, 2007). According to Safaricom (2011) there were 23, 397 of these M-Pesa agents

countrywide, as at December 2010. Must & Ludewig (2010) concur with the foregoing by stating that, because mobile money is a cheaper, safer, and more convenient way to transfer funds, and it reduces the costs associated with saving and lending, consumers in developing countries are recognizing its benefits.

In his speech to launch the Financial Access 2009 Report, the Central Bank Governor Professor Njuguna Ndung'u stressed the importance of expanding access to financial services, formal and informal, to enhance the country's socio-economic development. He lauded the emergence of homegrown solutions such as M-Pesa which he claimed to have greatly improved access to financial services to the rural areas and the poor in our society (Central Bank of Kenya, 2009).

The mobile phone is a dynamic technology with several functions, other than those mentioned above. These functions increase from day to day. However To help narrow down the scope of this research paper, I have highlighted the most basic and popular functions within the country. In conclusion, we can attribute the rapid adoption of mobile phone technology in developing countries to a combination of low infrastructure costs, the rise of pre-paid service, the decrease in handset prices, and the privatization of mobile phone service. Mobile phone connectivity in otherwise marginalized communities facilitates social and economic development through increased access to people, information, and services such as health care, education, employment opportunities, and market information. Mobile phones also make it easier for small business owners to order products and interact with customers. In these instances, mobile phones facilitate development by making it easier to exchange information. With mobile money, phones can promote economic development by making it easier to exchange money (Must & Ludewig, 2010).

2.5 Social Interaction and the Mobile Phone

2.5.1 An Overview of Social Interaction

According to Thomas (1995), humans are social beings who live and work in groups and interact in predictable ways. Society generally has a structure that guides human interaction by helping them know what is expected of them in most social situations and what they can expect from others. This structure ensures that the general nature of society remains relatively stable from one generation to the next thus promoting continuity. Therefore, social structure, according to

Thomas (1995) could be taken to mean the network of interrelated statuses and roles that guide human interaction.

Status is defined as a socially defined position in a group or in a society. Each status has attached to it one or more roles. A role is said to be the behavior (rights and obligations) expected of someone occupying a particular status. Statuses serve merely as social categories and can either be assigned according to standards beyond a person's control (ascribed status) such as age, race and gender or can be acquired on the basis of some special skill, knowledge or ability (achieved status). Achieved statuses include an occupation, being a spouse or graduate. Roles bring statuses to life (Thomas, 1995).

Thomas (1995) goes on to argue that social behavior is by definition group behavior. Human interaction, he says, takes place in groups and within the context of a society. He defines a group as a set of two or more people, who interact on the basis of shared expectations and who possess some degree of common identity. We all belong to more than one group and interact with more than one set of people. Groups can either be primary, such as the family or secondary, such as employer-employee. A group can also serve as a reference group, this is any group with whom individuals identify with and whose attitudes and values they often adopt, for example clubs or occupations. It is also important to note that all groups have clearly marked boundaries which help to distinguish between members and non-members. The group one belongs to and identifies with is known as an in-group and the one that he or she does not identify with is an out-group. The web of relationships that is formed by the sum total of a person's interactions with other people is termed as a social network. They, unlike groups, do not possess a common identity or shared expectations, but they do provide us with a feeling of community and opportunities for career and social advancement.

2.5.1.1 Types of Social Interaction

Thomas (1995) states that some forms of interaction help to stabilize the social structure while other forms promote change. The most common forms of social interaction are exchange, competition, conflict, cooperation and accommodation. Thomas (1995) argues that almost all daily interaction involves exchange, that is, when individuals, groups or societies interact in an effort to receive a reward or a return for their actions. This reciprocity is the basis of exchange and the rewards can be both material and non-material. Courtship, family and politics all involve

this form of interaction. The importance attached to exchange in our everyday life lead to the development of the exchange theory, which puts forward the notion that people are motivated by their self-interest in their daily interactions with others. Further, it posits that behavior that is rewarded is repeated but when the costs of an interaction outweigh the rewards, it is more likely that the relationship will come to an end. Consequently, exchange theorists believe that social life can be explained as the attempt to maximize rewards while minimizing costs.

Competition is the second type of social interaction put forward by Thomas (1995). It occurs when two or more persons or groups oppose each other to achieve a goal that only one can attain. Competition has always been the cornerstone of capitalistic economic system and democratic governments and is essential in the advancement of business, sports and education amongst others. Sociologists view it as a positive means to motivate people to perform society's needed roles. However, it can also lead to psychological stress and conflict.

Conflict as a mode of interaction involves deliberately attempting to control by force, oppose, harm or resist the will of another person or persons. There are four sources of conflict, wars, conflict within groups, legal disputes and clashes over ideology. Although conflict is usually referred negatively, sociologists have pointed out that it can at times be useful. For example, it reinforces group boundaries and strengthens group loyalties by focusing attention on an out threat thus drawing away attention from internal problems. It can also lead to social change by bringing problems to the forefront and forcing the opposing sides to seek solutions.

Cooperation, on the other hand, occurs when two or more persons or groups work together to achieve a goal that will benefit many people. It is the social process that gets things done as no group can achieve their goals without cooperation from its members. It is often used along with other forms of interaction.

Lastly, when group members do not cooperate and at the same time do not engage in conflict, then they simply accommodate each other. Accommodation is a state of balance between cooperation and conflict. Accommodation can be in the form of comprise or a truce. A comprise is reached when two parties both give up something to come to a mutual agreement while a truce brings a halt to the conflict until a compromise is reached. When this is not possible, Thomas (1995) informs us that a third party is called in to act as an adviser and counselor in helping the

two reach common ground. This is known as mediation. Another option is to use arbitration where a third party makes a decision that is binding to the parties in conflict.

2.5.2 The Impact of Mobile Phones on Social Interaction

The interaction between technology and social structure can either enhance its functioning or lead to conflict within these structures. From directly observing this interaction over a period of time, one gets to see how, to a certain degree, our social system is changing and adjusting itself to accommodate the various forms of new, innovative and revolutionary technology in our society (Ling, 2000).

Corbett (2009) asserts that cell phones are taking over on a global level not just a local level, allowing individuals to have the sense of security that wherever they go, they will be able to remain in social contact with those whom are in their social networks. Communication and the way that individuals interact with each other is a huge dynamic of sociology. The cell phone is changing the way in which all of this interaction occurs, which makes it sociologically relevant. With the creation and accessibility of cell phones, more and more individuals own their own cell phone and using them every day to communicate within their social network. Cell phones also make individuals available anywhere and anytime, which changes the way that individuals are choosing to interact in social settings with other individuals.

Ling (2004) notes that mobile telephony is a technology that is quickly finding its niche in society. This technology has become reliable and easily accessible. In addition, it has been adopted on a large scale, and it is on its way to becoming a taken-for-granted part of the social landscape in many countries. He points out that from a sociological perspective, the process of socially defining the mobile phone is revealing in itself. The rise of this technology gives us a chance to observe its adoption. Beyond giving us an insight into innovation, it affords us the chance to see how the innovation is accepted and how it causes the revision of existing values and practices. It allows us to see who is influencing the revision process and, in effect whose toes get stepped on. The adoption of mobile phone technology means that we have to make adjustments. It shifts ideas about where and when we can travel, how we organize our daily lives, what constitutes public talk and how we keep track of our social world. In addition, our use or refusal to use, says something about us as individuals. Conci, Pianesi & Zancanaro (2009)

however claim that despite its enormous growth and social diffusion, the amount of studies in the area of acceptance of mobile phones is relatively small. In recent years, however, researchers have started to focus on the social and psychological aspects of the mobile phone diffusion, and on its impact on people's daily lives and relationships.

Kling (1996) examines some specific controversies about the kinds of social relations that people in America develop when they communicate via computerized networks, which includes mobile phones. He states that the search for "a sense of community" has been an enduring theme amongst people. Ironically, the technologies of freedom - trains, cars, and airplanes; telephones, faxes, and computer networks - have enabled us to be on the move, and to live, work, and do business with more people with whom we share very limited parts of our lives. At a time when community life in North American cities is unraveling, some people hope that people can meet and enrich their social lives at work and at home via computerized networks. He adds further that the ways that people work and communicate via internet networks destabilizes many conventional social categories. For example, he refers to "social lives at work and at home" as if they refer to distinct places as well as webs of social relationships. But telecommuting and virtual offices enables people to work routinely while they are in their homes, and blurs these boundaries.

According to Ling (2004) qualitative interview data as well as quantitative analysis indicates that mobile phone telephony provides a safety link for those who have chronic sickness as well as those who find themselves in dicey situations. They give people a sense of never being alone in an emergency. Mobile phones have been greatly used to coordinate and organize search and rescue activities during catastrophes such as terrorist attacks, floods and earthquakes. They also provide a way for victims of these incidents, their families and friends to exchange comfort. Leek and Christodoulides (2009) agree with this by stating that the new generations of mobile phones started to incorporate advanced computing and communication facilities, such as location-tracking or position-aware applications, which can be used by mobile phone companies, relatives and friends, or third parties, to identify the specific location of a mobile phone user. These additional features are of great importance when trying to track a missing loved one.

Mobile phone technology in Kenya is offering 'the kiss of life' to health sector as noted by Wambugu (2011). In a recent article in *The Sunday Nation*, he reveals that the health sector is using the rapid growth of mobile telephony to resuscitate itself and reverse the trend of the health outcomes by exploring ways of tapping into the power of this technology. The sector believes that mobile phones can improve access to, quality of and efficiency in the delivery of health care, as well as disease prevention and well-being. He asserts that telecommunication industry stakeholders are not health experts, and health experts rarely fully comprehend the potential that technology may provide in achieving critical health objectives. Therefore the two groups need to work closely to expand health services.

Wambugu (2011) introduces the term M-Health (mobile health) as term used for the practice of medical and public health supported by mobile devices and has been identified as viable solution to the ills that plague the Kenyan health sector. M-health allows patients and health professionals to interact without the need to be in the same place. He explains that this has revolutionized several components of the health delivery system, such as collecting clinical and community health data and monitoring a patient's vital signs in real time. This augments the direct provision of care by linking health care workers to patients, delivering health care information to practitioners, researchers and patients, as well as addressing supply chain management problems. Mobile phones could also play a significant role in health financing systems, including authentication of health of health insurance subscribers, monitoring of health benefits and paying for health benefits and products.

The article also discloses that M-health is not new to Kenya. The US Center for Disease Control and prevention funded an m-health programme in Western Kenya where HIV-positive patients were sent weekly text messages inquiring about their well-being. Patients responded to the messages that they are fine or that they had a problem, a health worker would then call back to assist them. M-health has also been used at a limited capacity in Kenya for education and awareness programs largely spreading mass information from the source to recipient via SMS, making it relatively unobtrusive. M-health is providing an avenue to far reaching areas that may have limited access to public health information, workers and clinics.

Corbett (2009) however, contends that while the mobile phone has provided a new avenue to social networking and interactions, the change in the space and time concept has also had a negative effect as well. He suggests that many of us have likely experienced a situation where we have been in the presence of a mobile phone user who is engaging in some form of rude behavior that lacks respect for the individuals around them. Mobile phones have changed the way that individuals socially interact. Individuals are communicating more via text messages and cell phones than they are face-to-face, changing our social environment. Individuals have become enveloped in their cell phones and less aware of their social surroundings, missing out on possible new social interactions.

From the above, it is evident that mobile phones have become an integral part of our daily lives; many people are finding it very difficult to imagine life without the possibility of using its numerous and dynamic functions. Elaborate communication and social practices have evolved around the use of mobile phones, in how people communicate with each other, conduct their lives, relationships and business, and consume information and media services. There still are numerous opportunities for future research on the effects of the mobile phone and social relationships. Research can be done on how the mobile phone affects various relationships over time, such as marriage, parent-teenager, employer-employee and the like. Other areas like the long term community health effects and how the access and use of mobile phones varies through different social strata are also little explored areas. However, it is evident that in its short history, the mobile phone has already had a huge impact on the way individuals interact with one another.

2.6 An Overview of Entrepreneurship

The role of entrepreneurship in economic development involves more than just increasing per capita output and income; it involves initiating and constituting change in the structure of business and society. This change is accompanied by growth and increased output which allows more wealth to be divided by the various participants. What in an area facilitates the needed change and development? One theory of economic growth depicts innovation as the key, not only in developing new products or services for the market, but also in stimulating investment interest in the new ventures being created (Hisrich, Peters & Shepherd, 2008). Innovation is therefore essential for solving problems that impose significant social and personal costs, in

addition to producing beneficial consequences for a great number of people within the society. These dynamic business and sociological conditions have given rise to a new era in business: the era of the entrepreneur.

Hisrich, Peters & Shepherd (2008) define entrepreneurship as the process of creating something new with value by devoting the necessary time and effort, assuming the accompanying psychic and social risks, and receiving the resulting rewards of monetary and personal satisfaction and independence. Holt (1992) highlights the works of Joseph Schumpeter, a revered Harvard economist, who revived the concept of entrepreneurship in the early and mid-1900s by describing it as "creative destruction", whereby established ways of doing things are destroyed by the creation of new and better ways to getting things done. Schumpeter put forward the notion that entrepreneurship is often a subtle force that challenges the order of society through marginally small changes. He further described entrepreneurship as a process and entrepreneurs as innovators who use the process to shatter the status quo, through new combinations of resources and new methods of commerce.

According to Holt (1992) entrepreneurship encompasses both small businesses and large corporates. This research paper is focusing on entrepreneurship in small businesses owing to the fact that it is limited to slum areas, which are generally regarded as low-income communities. Holt (1992) explains that small business is a very personal approach to creating new enterprises. Small businesses usually have limited growth opportunities and operate in a community environment. They are mainly started by individuals who seek income substitution and are concerned with filling the immediate needs of their customers and clients, within the scope of well-defined markets. Opportunities in small businesses arise from business niches and local shifts in consumer demands, basically, any change that fosters an unfulfilled need. For example, the advent of low-cost mobile handsets targeted at low-income communities brought about the need for scratch card vendors, community phone vendors and mobile money transfer vendors within these communities.

2.6.1 Entrepreneurship and Mobile Phone Technology

From direct observation, we can tell that mobile phone technology has reformed and revolutionized previously established modes of communication, commercial and non-commercial transactions, across the various strata of society. Linna & Richter (2011) highlight

that over the past decade the ICT sector has been among the major drivers of economic growth for Sub- Saharan Africa. Hence, it is expected that the ICT sector will be the driving force of fundamental economic change within the continent. The ICT sector is not only growing in the amount of subscribers but more importantly new kind of ICT knowledge and businesses are arising from this knowledge. More specifically, they found that it was generally agreed that mobile applications represent a huge market opportunity in Kenya due to the unmet needs of the low income communities. Local entrepreneurs regard applications for social change as a welcome business opportunity and recognized that ICT, and in particular mobile phone applications are a powerful tool to address social challenges and change the fate of poor people.

According to Eagle (2005) the boom of mobile phones in Kenya has been credited for much of the activity in its small business sector. He claims that adding an additional ten mobile phones per 100 people boosts a typical developing country's GDP growth by 0.6 percent. This boost comes from the innovative use of mobile phone technology by local entrepreneurs. Kenyan business men, farmers, and laborers of all sorts are finding new uses for a tool thought of as two-way voice communication devices in the traditional Western paradigm and coming up with original methods for solving their own problems. For example, contract laborers can now provide their phone numbers to potential employers and move on, instead of having to wait for hours at a workplace in case a job arises. In addition, Eagle (2005) asserts that access to market information through mobile phones also provides rural communities with invaluable information about centers of business. The Kenya Agricultural Commodity Exchange (KACE), now provides crop growers with up-to-date commodity information. Farmers can access daily fruit and vegetable prices from a dozen markets through a text message. Consequently, rural farmers have quadrupled their monthly incomes because they have access to information about potential buyers and prices before making the often difficult journey into urban centers to sell their produce. Mwangi (2007) concurs with the foregoing and states that traders benefit from information of the Agricultural commodity prices. A service branded as SMS *Sokoni* (Swahili for Market) is provided by Safaricom Limited in conjunction with Kenya Agricultural Commodity Exchange (KACE) which is a private sector firm that facilitates a linkage between sellers and buyers of agricultural commodities.

Eagle (2005) further notes that the community payphone, known in Kiswahili as "simu ya jamii", has helped bring mobile phone usage to the poorest areas of Africa. These payphones are created by entrepreneurs who buy airtime from the network and subsequently sell it to local people who don't own phones themselves. According to the CCK (2005) over 5,000 of these community phones had been established by the end of 2004. The payphones are easy to operate in isolated areas far from the nearest traditional telephone landline, and can be used even where there is no electricity, as they can be powered by either solar or car batteries. However, use of these community pay phones decreased when mobile phone handsets became cheaper and more affordable to low income communities.

Mwangi (2007) in his research on the impact of mobile phone technologies on Micro and Small Enterprises (MSEs) highlights that Kenya's informal sector constitutes 98% of all businesses in the country, absorbing a high population of school, college and university leavers. The increased accessibility to mobile phones has introduced changes in most sectors of the economy and particularly this urban informal sector, consequently changing their business and operation environment, thereby creating an impact on Kenya's fastest growing sector and employer. Mwangi (2007) found that the perceptions from the micro-entrepreneurs on the impacts that various communication modes showed that mobile phones had the highest perceived impacts on their MSEs at 88.4% of the respondents while only 2.3% of the respondents felt that the mobile phones had no impacts on their MSEs. This was contributed by the fact that most of the businesses had no access to fixed lined and fax machines and hence felt no impact about them on their businesses. The mobile phones were the most available tool to be used to perform business activities with the micro entrepreneurs. The mobile phone as a tool, transformed the way entrepreneurs conducted their businesses.

Practical Illustrations of how MSEs have benefited from the adoption of mobile phone technology include reduced costs of travelling and time, owing to the fact that they can now settle their utility bills and carry out basic bank transactions using this technology. In addition, the micro-entrepreneurs who can afford mobile advertisements are benefitting from this innovative way of reaching the masses. *Sasanet* is an example of an online /mobile advertisement company, which allows the mobile phone subscribers to send a free SMS with an advert appended on the message. The benefits to MSEs discussed above are reinforced further by

Donner (2005) who, in his research on the use of mobile phones among micro-entrepreneurs in Rwanda, found that Kigali's micro entrepreneurs use their mobiles to increase the frequency of their contact with friends, family, and existing business contacts, and to facilitate new contacts with business partners, suppliers, and customers. Micro-entrepreneurs, policymakers, researchers and all other stakeholders have a hand in looking for more innovative ways in which technologies can enhance the productivity of businesses hence bringing about significant economic growth. The benefits of integrating and using mobile phone technologies in the microenterprises cannot be ignored by any government (Mwangi, 2007).

Rangaswany & Nair (2010) sought to study small, self-owned shops that conducted trade concerning mobile phone consumption, in the Mumbai slum community in India. They discovered four broad trends about business networking in the slum. Firstly, primary business was conducted through local social networking, secondly, these networks evolved to expand services, thirdly, outbound networks mostly connected non-formal socioeconomic sectors of the city and lastly, networks integrated local business practices to service a range of needs. They also found that small entrepreneurs managing these stores became agents that actively mediated technology diffusion by occupying a consultant role in the community, by marshaling social networks and communication channels to expand businesses and by bringing in new technology and learning new skills to meet and promote consumer demand. The research noted that the entrepreneurs behind these stores assumed a variety of roles; they forged relations with procurement channels, mediated between mobile phone companies (even multinational corporations) and the consumer, expanded business loops while renewing existing ones, and encouraged apprenticeships for relevant repairing skills.

Aker & Mbiti (2010) summarize the correlation of mobile phones and economic development by identifying five potential mechanisms through which mobile phones can provide economic benefits to consumers and producers in Sub-Saharan Africa. First, mobile phones can improve access to and use of information, thereby reducing search costs, improving coordination among agents, and increasing market efficiency. Second, this increased communication should improve firms' productive efficiency by allowing them to better manage their supply chains. Third, mobile phones create new jobs to address demand for mobile-related services, thereby providing income-generating opportunities in rural and urban areas. Fourth, mobile phones can facilitate

communication among social networks in response to shocks, thereby reducing households' exposure to risk. Finally, mobile phone-based applications and development projects have the potential to facilitate the delivery of financial, agricultural, health, and educational services.

In conclusion, Mwangi (2007) states that, the adoption and use of mobile phones is the product of a social process, embedded in social practices. Micro enterprises are practices which lead to some economic benefits, defined through a social context, therefore, the community defines the various uses of the mobile phone, whether business or social communication.

2.7 Mobile Phones in Low-Income Communities

2.7.1 The Case of 'Favelas' in Rio De Janiero, Brazil

De Souza e Silva (2008) carried out research on mobile phone use among low income communities in the infamous 'favelas' (Brazilian for slum) of Rio De Janiero, Brazil. Favelas are low-income communities and settlements similar to those found within urban slum areas within Nairobi such as Mathare, Kawangware, Githogoro and the focus of this research paper, Kibera. Like Nairobi, Rio de Janeiro is densely populated with people of diverse social, cultural and economic backgrounds. The city, however, has a peculiar characteristic: high- and low-income populations live side-by-side in very close geographical areas. For example, De Souza informs us, a bird's-eye view of Ipanema, one of the wealthiest neighborhoods in Rio, reveals a favela on one of its hills. These hills were randomly occupied since the end of the 19th century, and because residents do not officially own the land, the favelas have scarce provision of basic services, such as electricity, gas, or landlines. This scenario is replicated in Nairobi where Kibera slum and Karen suburbs, Kawangware slum and Lavington suburbs, Mukuru slum and South 'B' suburb, Kangemi slum and Mountain View suburb, Runda suburb and Githogoro slum all co-exist. The residents of the favela, similar to those in Kibera, try to live as close as possible to their workplaces.

The same researcher highlights that cell phone growth increased in Brazil when pre-paid phones became available in 1998 . In December 2007, 80% of all cell phones in the country were prepaid_. Among the low-income population, cell phone use is mainly defined by costs. Since the majority of the favela population earns less than the minimum wage, acquiring a cell phone might be a challenge. Majority of interviewees from the favelas said they do not pay at all for

their cell phone, since adding credit on a regular basis is too expensive for them. Theoretically, a user is supposed to add credit every three months in order to keep the line active. However, most favela dwellers know that even when receiving warning messages from their provider, the device is rarely de-activated. So, low on credit, a cell phone owner will call another one, but drop the call upon connection.

De Souza e Silva (2008) continues to observe that most people in low-income communities use their cell phones for voice calls. It is intriguing to say the least to see the amount of investment in the newest technologies such as 3G, location-based services, and camera phones, when the majority of the population does not even pay a cell phone bill. With high penetration rates, cell phones in Brazil are no longer considered a status symbol. Even in low-income communities, a cell phone is viewed as a necessity, as an item that is part of daily life like a TV or a refrigerator. However, the ownership of expensive devices or services is still considered a symbol of status, since they are mostly inaccessible for this population. Community members acknowledge that it would be nice to have a device that can access the internet and send pictures, but these services are too expensive for the average favela dweller. Although favela dwellers acknowledge owning their cell phone, they typically share the device with other family members, especially if the cell phone is the only phone in the house - or in the neighbor's house. Therefore, the typical image of a cell phone as a personal device does not always apply.

After GSM phones became popular in 2005, cell phone theft considerably increased in the majority of big cities in Brazil. In São Paulo, cell phones were the most stolen items in 2007. Devices are generally expensive, but it is easy to replace a SIM card. Frequently, recent cell phone models come to the favela by the very hands of the middle- and high-income classes. It is common practice to visit the favela to buy drugs and give a cell phone in exchange. Thus, cell phones become a type of currency. Devices originally used by a privileged section of the population end up in the favela, have their SIM cards replaced, are transformed into prepaid phones and are sold or given as presents among the community.

Cell phones have been studied as devices that promote safety and security (most notably by Ling, 2004). Favela dwellers also say they need cell phones for safety. However, instead of calling the police in case of an accident, they want to be able to call the favela before going back home to

make sure the situation is safe there. In the favela drug lords might battle for territory, and shootings between them and the police occur. Many also point out the need for a cell phone because there are no landlines or pay phones around. As in most places in the world where cell phone numbers increase, pay phones are scarce in the favela, therefore, cell phones replace a missing landline infrastructure.

Favela dwellers also informed the research team that it might be dangerous to use a cell phone on the bus since that can attract a thief's attention. One of the dwellers said that "Even if the cell phone just rings, somebody might follow you after you get off the bus and take it. Then, if the device is a good one, he will sell it in the favela. If it is a cheap cell phone, he will give it to the kids to play with". Buses circulate around the whole of Rio, including wealthy neighborhoods such as Ipanema and are used not only by the low-income but also by the middle class population. Yet again, this is the same scenario between Kibera slum and Karen suburb where the residents share public transport. This type of discourse demonstrated that it is common practice among low-income communities to take cell phones from the most affluent areas of the city to re-sell them in the favelas. In fact, in one of the communities, all cell phone owners interviewed had bought their devices on the parallel market inside the slum. This is viewed as reasonable since the majority would not be able to buy a device if they needed to pay the full price for it. As it is also easier to buy from inside the community, nobody even considered going to a store.

A reasonable conclusion for the growth in cell phones is that despite the poverty in the country, low-income people are indeed acquiring them. Besides the different uses that emerge from security and privacy issues, three tendencies that come from the need to control costs have been observed: the rise of pre-paid phones, the sole use of the cell phone's basic functions and the creation of a parallel market. The exponential cell phone increase in developing countries is a worldwide tendency. However, in a place with economic inequalities like Brazil, it is fallacious to think that cell phone use is homogeneous across different sectors of the population. De Souza e Silva (2008) research clearly showed that cell phone use among these communities differs greatly from what one expects to encounter in North America, Europe, or even among the privileged population in Rio and São Paulo. In fact, we can see how these communities appropriate technology by changing its primary purpose.

The study concludes by emphasizing that although most early research into cell phone use focused on developed countries and on the issues of privacy, security, and teenage use, recent research emphasizes cell phone use and appropriation among low-income communities in developing countries. Interestingly, cities such as Rio de Janeiro include both of these realities, with two types of very different users impacting on other. With the inevitable introduction of new services which might lead to an even bigger gap in technology consumption and population connectivity we need to ask ourselves how to create opportunities to address these issues, and to develop a legitimate market in the country.

2.7.2 The Case of Grameen Telecom Village Phone (VP) Program in Bangladesh

Richardson, Ramirez & Haq (2000) highlight that in rural areas where isolation and poor infrastructure services are often the norm, telecommunications can play an extremely important role in enhancing rural social and economic development. To demonstrate this clearly, they carried out research on Grameen Telecom's Village Phone programme in Bangladesh, where they found that this innovative approach to poverty reduction provided valuable learning and case study materials that can contribute to strategies for improved success in poverty reduction using ICT.

In Bangladesh, like other developing countries, telecommunication services remained unaffordable and inexpensive to the low income communities because of an inadequate number of consumers, yet the potential consumers could not afford it. Hence, Grameen Telecom attempted to solve this problem by combining, under one umbrella, non-profit and commercial organizations. This gave the group flexibility to cross-subsidize its rural telecom operations and to draw upon finances and profits from its urban operations, to offer loans to its rural clients. Subhash et al (2007) continues and comments of how incredible it is that in 1997, when the cell phone was still a technological novelty the world over, Grameen Telecom successfully initiated the use of this tool for empowering the rural poor.

Subhash et al (2007) go on to explain that the Village Phone (VP) program is an initiative of the Grameen Bank, a well-known non-governmental organization (NGO) providing economic assistance to poor villagers in rural Bangladesh. Grameen Bank provides small loans without collateral to the villagers, primarily women, for their various income-generating activities.

Grameen Telecom was created as a telecommunications network that would significantly advance social and economic development in rural Bangladesh by enabling villagers to access the latest business and market information. Villagers, mostly women who are members of the Grameen Bank's microcredit program, were provided with loans to purchase cell phones. These "operators" then provided telephone services to the villagers, thereby earning enough revenue to repay the loan taken from the Grameen Bank. Grameen Telecom bought airtime in bulk from a sister company, Grameen Phone, so that it could charge the operator a discounted rate on the airtime used. The program started in 1997 and set a target of installing 40,000 Village Phones by December 2004. It has made rapid progress and by October 2002, the number of Village Phones had grown to 20,000 in operation in 18,581 villages. Each of these phones allowed access to 1,500 people on average; nearly 7 million people were covered in 40 districts (Subhash, 2007).

The VP program was designed to maximize gains for villagers in several ways. Firstly, access to a cell phone at low cost empowered villagers significantly in their work domain. They were able to make phone calls to obtain information vital for their businesses, in addition to being able to seek new work opportunities directly, thereby reducing their dependence on middlemen. Secondly, the program led to the empowerment of the phone operators, primarily poor rural women, who now command respect in the village community by virtue of their economic independence and the fact that villagers depend on them to obtain a valuable service (Subhash, 2007).

The program yielded significant positive social and economic impacts as accentuated by Richardson, Ramirez & Haq (2000). By bringing telephones within the reach of rural poor Bangladeshis, many of the business people transacted via cell phone thus saving time and money, which would otherwise have required trips to distant villages. The research showed that these trips cost 2 to 8 times the expense of a telephone call. The VP also facilitated the safe transmission of funds. Bangladesh being a labour-exporting country, a high proportion of the village folk work away from home, making the cell phone an instrument to ensure that all of the money remitted by them reaches the intended recipients in villages. Instances of theft, reduction in the original amount, and long delays in delivering the cash were common when money was sent by friends or relatives traveling back to the village or a nearby place. In addition, when using the VP, the villagers who received remittances could now obtain accurate details of foreign

currency rates, thus minimizing the risks of underpayment or nonpayment when money was earned abroad. It was found that discussions of financial matters, including remittances, accounted for 42% of the total calls.

With regard to the Village Phone's impact on social interaction, the research showed that social calls accounted for 44 percent of the total number of calls. Many households in rural Bangladesh have at least one member living abroad, therefore, telephone conversations between family members provide a chance to stay in touch and reduce the feeling of isolation on both sides. More broadly, Village Phones delivered multidimensional benefits for the rural poor users, who according to Richardson, Ramirez & Haq (2000), make nearly 25 percent of all calls through VPs. Individual users also benefited in terms of better prices, lower cost of travel, more employment opportunities, better access to health facilities (it was observed that 10 percent of calls were made for a health-related purpose). Communities continue to benefit through improved law and order and quicker response in coping with calamities.

The average monthly revenue of a VP subscriber, Richardson, Ramirez & Haq (2000) informs us, is about US$140. On average, each of the VP operators earns a profit of US$2 per day after meeting all costs, resulting in earnings of more than US$700 per year, more than double the annual per capita income in Bangladesh. The VP operators have benefited through increased income, and in many ways have improved their status in their families and in the larger society.

2.8 Theoretical Framework

Kerlinger (1964) defines a theory as a set of interrelated concepts, definitions and propositions that presents a systematic view of phenomena by specifying relations among variables, with the purpose of explaining and predicting phenomena. Nachmias & Nachmias (1996) concur with the foregoing by noting that theories help us explain and predict phenomena of interest and in consequence, to make intelligent and practical decisions. Credible theory, they say, is the conceptual foundation for reliable knowledge. The Diffusion of Innovation Theory and Domestication of ICT Approach, provide a suitable framework to help examine and explain the impact that mobile phone technology has had on socioeconomic development in urban slums.

2.8.1 Diffusion of Innovation Theory

Everett Roger's theory of Diffusion of Innovations seeks to explain how, why, and at what rate new ideas and technology spread through cultures. This theory stemmed from his research on how farmers adopted agricultural innovations in Iowa Sate, USA. Rogers (1995) proposed four main elements that influence the spread of a new idea; they include the innovation, communication channels, time and a social system. Consequently, he defines diffusion as the process by which an innovation is communicated through certain channels, over time, among the members of a social system. He theorizes that when individuals are in the decision making process of whether or not to adopt an innovation, they generally progress through five stages: knowledge, persuasion, decision, implementation, and confirmation. If the innovation is adopted, it spreads through various communication channels. During communication, the idea is rarely evaluated from a scientific perspective but rather, subjective perceptions of the innovation, influence diffusion. This process occurs over time. Finally, social systems determine diffusion, norms on diffusion, roles of opinion leaders and change agents, types of innovation decisions, and innovation consequences. Sahin (2006) argues that Rogers' diffusion of innovations theory is the most appropriate for investigating the adoption of technology owing to the fact that most of the research carried out on diffusion involves technological innovations, so Rogers usually used the word "technology" and "innovation" as synonyms.

Rogers (1995) defines several fundamental characteristics of innovations that influence an individual's decision to adopt or reject an innovation. Firstly, its relative advantage, that is, how improved an innovation is over the previous generations. For example, the mobile phone is seen to be a great improvement from its predecessor, the fixed telephone line. Secondly, the innovations level of compatibility to integrate into an individual's life. Thirdly, if the innovation is too difficult to use, an individual will not likely adopt it. Fourthly, the ease of an innovation to be experimented with as it is being adopted. If a user has difficulty in using and trying out an innovation, this individual will be less likely to adopt it. Lastly is the extent to which an innovation is visible to others. An innovation that is more visible will drive communication among the individual's peers and personal networks and will in turn create more positive or negative reactions.

The model further classified adopters into five ideal types, based on their level of 'innovativeness'. It described innovativeness as the degree to which an individual is relatively earlier in adopting a new idea than other members in a social system. The first category was that of Innovators (2.5%), who were described as being enterprising and educated, with multiple sources of information and a greater propensity to take risks. Their main motivation is of being a change agent in their reference group. They appreciate technology and are willing to tolerate initial problems that may accompany new products or services and are willing to make shift solutions to such problems. Early adopters (13.5%) on the other hand are the social leaders, popular and educated. Being the visionaries in their market, they seek to adopt and use new technology to achieve a revolutionary breakthrough that will achieve dramatic competitive advantage in their industries. They are attracted by high-risk, high-reward projects and are not very price sensitive because they envision great gains in competitive advantage from adopting a new technology. However, they demand personalized solutions and quick-responses and expect service from highly qualified sales and support personnel.

Early majority (34%) form the next set of adopters who are deliberate, have many informal social contacts therefore, face-to-face communication rather than mass media is more influential in the decision to adopt. Part of the low-income communities would be placed in this category. They are motivated by evolutionary rather than revolutionary changes. The fourth category of adopters is the late majority (34%). They are skeptical, traditional and of lower socio-economic status. They are very price sensitive and require completely preassembled, bulletproof solutions. They are motivated to buy technology just to stay even with the competition and often rely on a single, trusted adviser to help them make sense of technology. Laggards (16%) are the last group of adopters and are generally technology skeptics who want only to maintain the status quo. They tend not to believe that technology can enhance productivity and are likely to block new technology purchases. Roger's greatly appealed to the disciplines of marketing, management science, advertising and customer relationship management amongst others (Rogers, 1995).

It is inevitable that the adoption of an innovation has both positive and negative consequences. Wejnert (2002) details two categories of consequences: public vs. private and benefits vs. costs. Public consequences refer to the impact of an innovation on those other than the actor, while private consequences refer to the impact on an individual actor. Public consequences usually

involve collective actors, such as countries, states, organizations or social movements and the results are usually concerned with issues of societal well-being. On the other hand, private consequences usually involve individuals or small collective entities, such as a community and are usually concerned with the improvement of quality of life or the reform of organizational or social structures.

The current wave of anti-government protests within Arab nations sparked by inciting articles and discussions via social media networks such as Facebook, Twitter and MySpace, is a good example of public consequences of technological innovation. Private impact can be illustrated in a scenario where a person who works and lives in an urban city, hundreds of kilometers from the rural home where their parents reside, can, via a mobile phone constantly keep in touch with them without necessarily having to incur costs and time travelling from time to time.

The benefits of an innovation obviously refer to the positive consequences, while the costs refer to the negative. Costs may be monetary or non-monetary, direct or indirect. Direct costs are usually related to financial uncertainty and the economic state of the actor. Indirect costs are more difficult to identify, a suitable example is where one has to purchase and install a mobile tracking device in their mobile handset, due to the increased cases of cell phone theft. Indirect costs may also be social, such as social conflict caused by innovation.

2.8.2 Domestication of Information Communication Technology Approach

Haddon (2001) highlights that the concept of 'domestication' has started to achieve some currency in approaches to understanding how information and communication technologies (ICTs) find a place in our lives. He reveals that in the 1990s, when Professor Silverstone at Brunel University first introduced the concept of domestication, he was partly influenced by the emerging literature on the process of consumption in general. The concept was originally used in British studies to provide a framework for thinking about ICTs confined to the home rather than portable ones and to a large extent, it emphasized interactions between household members and not society in general. Dr. Les Haddon informs us that he joined Prof. Silverstone in the second stage of the project, which had by then moved to Sussex University and whose framework was being employed for further studies and discussions in ICTs and social exclusion. This framework

provided a useful way of bringing together a range of assumptions and perspectives of our relationships with ICTs such as mobile telephony.

The domestication approach implies that ICTs come pre-formed with meanings through such processes as advertising, design and all the media discourses surrounding them, but afterwards households and individuals invest in them with their own significance. This includes the effort involved before acquisition in imagining how they might find a place in the home and a role in people's lives, the household discussions about the decision to acquire them and the process afterwards of locating these ICTs in domestic time and space. How exactly the concept of domestication has been employed in analysis and with what emphases depends both upon the researcher and the particular goals of the project (Haddon, 2001).

Ling (2004) summarizes the general points that Haddon (2001) notes as characterizing the domestication approach. First, there is the emphasis on consumption, not simply the purchase, of an item, be it a material or non-material artifact. Ling (2004) states that in order to understand the role of an item in a person's life, a researcher must have an overview of the negotiations and interactions associated with its acquisition and its ongoing role in the home or the social group. Secondly, adoption should be viewed as a process in which we go through a series of negotiations, both with ourselves and others in the home or social group, before deciding to acquire a certain artifact or service. These negotiations involve the degree to which we really need the object, amount to be spent, conditions in which we would use it and its placement in our lives or homes. These negotiations vary from person to person. In the context of this research paper, slum residences are most of the time grappling with satisfying their basic human needs, therefore, the purchase and maintenance of a mobile phone in the home is a process that involves intense negotiation as the domestication theory implies.

Haddon's (2001) third point as summarized by Ling (2004) is that, domestication is not a one-off process. There are on-going discussions, negotiation and arguments regarding its role in our domestic and/or social sphere. For instance, the placement, time consumed talking, texting or browsing the internet, the choice of ringtone, the choice or service provider of a mobile phone can all lead to interactions within a household or social group, where members feel the need to refine the role of the device and establish new rules as to the use of the mobile phone. The

domestication of an ICT such as the mobile phone can also leads to ambivalent feelings where, for instance, the time consumed on it, say by a spouse or child or the blurring of work/private life between an employer and employee. Such feelings may result in the unsuccessful adoption of an ICT device.

Fourthly, domestication is not only a mental process carried out by the individual, but also a social interaction between individuals. For example, parents or guardians serve as gatekeepers with regard to the adoption of mobile phones by their teenage children or where an adult child helps an elderly parent, who is a novice user, to understand the use of a mobile phone and how to integrate it into their lives. Further, the ownership or consumption of various artifacts helps us to classify others and is a type of lens through which we see them and interpret their social position. Thus, our own consumption becomes our own social identity. Lastly, how we experience ICTs is not totally predetermined by technological functionality or public representations but is also structured by social life (Ling, 2004). According to Silverstone and Haddon (1996), the domestication theory involves five steps in the adoption cycle. These steps include imagination, appropriation, objectification, incorporation and finally conversion. These steps describe the movement of an object or service from merely being an idea, to the actual purchase, the entrenching of the object in our lives and eventually, its externalization as part of our social profile.

Ling (2004) points out that domestication as an analytical perspective has several advantages. He highlights that unlike other approaches theorizing the adoption of ICTs, domestication does not necessarily stake out a final position. It assumes we arrange our lives and define ourselves in relation to technical objects and that these objects have consequences for the arrangement of our daily lives. Most importantly, it accommodates the notion that social factors are important in understanding the use of technology. He also views it as a pragmatic approach because it accepts the idea that technologies have an effect on the organization of society and on the other hand, society forms technologies. Domestication is further praised for avoiding narrowness by assessing both the interaction between the individual and the artifact, in this case, the mobile phone and the social context in which the artifacts are being defined and used. It accepts and proposes that adoption and use of objects or services is highly dynamic and changing. Ling

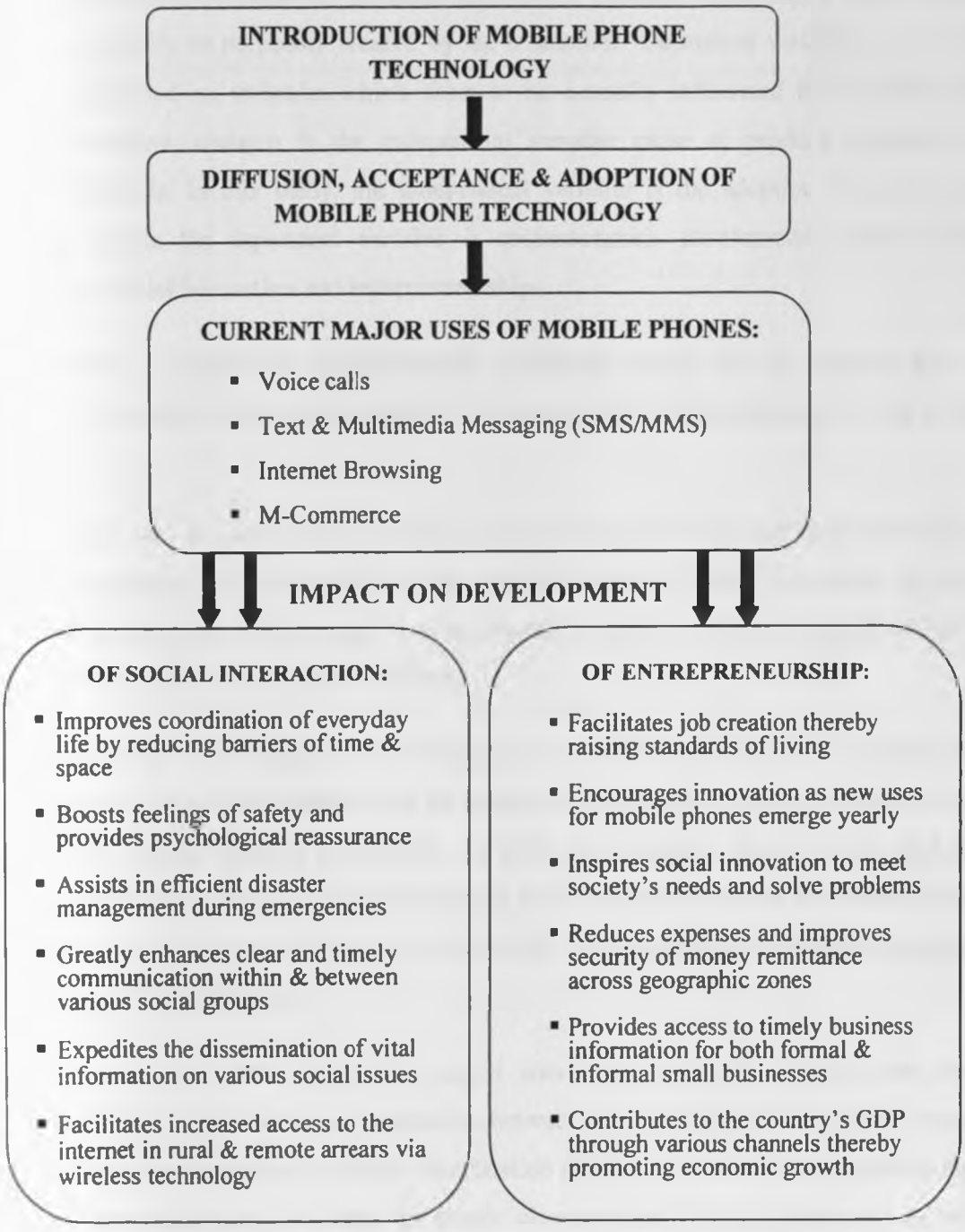
(2004) therefore defends and recommends the domestication theory as the most suitable approach in understanding the ongoing interaction between the mobile phone and society.

2.9 Conceptual Framework

Nachmias & Nachmias (1996) describe the conceptual framework as a level of theory where descriptive categories are systematically placed in a broad structure of explicit, assumed propositions, together with statements of relationships between two or more empirical properties, to be accepted or rejected. The propositions included within the framework summarize and provide explanations and predictions for empirical observations. This research paper is interested in investigating whether the introduction of mobile phone technology has significantly influenced social interaction and enterprise among the residents of Kibera slum in Nairobi.

Nachmias & Nachmias (1996) highlight that theorists often attempt to provide conceptual organization by using models. These models usually consist of the characteristics of some empirical phenomenon, including its components and the relationships between the components, represented as logical arrangements, among concepts. Hence, a model is an abstraction from reality that orders and simplifies our view of reality by representing its essential characteristics. Below is a model, figure 2.1, simulating the impact that the adoption of mobile phone technology has had on social interaction and enterprise among its users.

Figure 2.1: The Impact of Mobile Phone Adoption on Socio-economic Development as Extrapolated from the Literature Reviewed



Source: Researcher, 2011

2.10 Operational Definition of Variables

Marascuilo & Serlin (1998) define variables as all factors involved in a situation. They also describe independent variables as variables that have a causative effect upon other variables. They are artificially or purposely created by the researcher. Dependent variables, on the other hand, are described as variables which seem to be causally influenced by the independent variable. Therefore, changes in the independent variable cause or produce changes in the dependent variable. In this study, the independent variable is the adoption of mobile phone technology, while the dependent variable is socioeconomic development, whose variable indicators are social interaction and entrepreneurship.

Mobile Phone – Hand-held mobile/portable telephone device that is wireless and uses frequencies transmitted by cellular towers to connect calls and send/receive data between devices.

Social Interaction - It is a dynamic, changing sequence of social actions between individuals (or groups) who modify their actions and reactions due to the actions by their interaction partner(s). Social interactions can be differentiated into accidental, repeated, regular, and regulated. Social interactions form the basis for social relations.

Entrepreneurship - The capacity and willingness to undertake conception, organization and management of a productive venture, with all its attendant risks, while seeking profit as a reward. In economics, entrepreneurship is regarded as a factor of production together with land, labor, natural resources, and capital. The entrepreneurial spirit is characterized by innovation and risk-taking, and an essential component of a nation's ability to succeed in an ever changing and more competitive global marketplace.

The adoption of the mobile phone for various social and economic activities has directly impacted different aspects of social interaction between various groups in the social system. It has simplified communication, made the coordination of everyday life easier by eliminating the barriers of time and space, facilitated the timely dissemination of vital information to various vulnerable groups, enhanced the efficiency and effectiveness of disaster management during catastrophes such as earthquakes and floods and has also made users feel safer and more secure because they can easily reach their loved ones in event of an emergency.

Adoption of mobile phones has also influenced the growth of several factors which encourage entrepreneurship. Useful applications of the mobile phone have been created to make transactions easier, safer and more convenient. Entrepreneurs, via their mobile phones, are able to pay utility bills, perform bank transactions, save money for future use and receive timely information with regard to their different trades. The advent of the mobile phone has also created also created opportunities for those who are venturesome to start their own businesses as M-Pesa dealers, airtime distributors, community phone vendors, wholesalers and retailers of mobile phones and their accessories. This has also created a conducive environment for innovation to thrive, as technologists strive to create new, efficient and effective applications for this gadget daily. Social innovation and social entrepreneurship, where entrepreneurial approaches are used to solve social problems, have also thrived with the introduction of the mobile phone. Most notably is the M-Pesa application which has enabled the low-income earners, who could not afford to maintain bank account, to perform transactions which would have otherwise required one to have a bank account. This application is said to have banked the "unbanked" in society.

2.11 Hypothesis

A hypothesis is a tentative answer to a research problem, expressed in the form of a clearly stated relation between the independent and dependent variables (Nachmias & Nachmias, 1995). The hypotheses I have proposed hereunder are derived from both the theories discussed above and from direct observations of mobile phone users within Kibera slum.

1. The adoption of mobile phone technology has improved social interaction within urban slums.

2. The adoption of mobile phone technology has encouraged entrepreneurship within urban slums.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Scientific methodology, Nachmias & Nachmias (1995) seek to explain, is a system of explicit rules and procedures upon which research is based and against which claims for knowledge are evaluated. The system is neither changeable nor infallible, they claim, but rather the rules and procedures are constantly being improved. Having identified a knowledge gap and reviewed the relevant literature concerning the same, this chapter explains in detail the procedures that were followed in identifying, sampling, measuring and analyzing data, relevant to the study. Once analyzed, the data answered the research questions, rationalized the study objectives and ratified the proposed hypotheses.

3.2 Research Design

Research design is defined as the 'blueprint' that enables investigators to come up with solutions to the fundamental problems pertaining to empirical research such as who to study, what to observe or data to be collected, and guides them in the various stages of research (Nachmias & Nachmias,1995). Simply put, it is the outline of the actions undertaken to resolve the research problem or to fill the knowledge gap.

The study primarily took a quantitative approach, seeking to answer questions concerning the relationships among measured variables, with the purpose of explaining, predicting and controlling phenomena (Leedy & Ormrod, 2005). However, some degree of triangulation with qualitative techniques was used to give a better understanding and a more insightful interpretation of the general results, in addition to enhancing internal validity of the study. This also helped to overcome the challenges of intrinsic bias which are common in single-method, single observer studies. The qualitative techniques mostly manifested in the sampling methods and data collection instruments

The study adopted a cross-sectional approach, which is suitable when studying a number of individuals of different ages who have the same characteristic of interest at a particular point in time, in this case, mobile phone usage. Nachmias & Nachmias (1995) argue that the cross-sectional design is appropriate because it allows researchers to carry out studies in real-life

settings using probability samples, thereby increasing external validity. This model facilitated the statistical analysis of the relationship between the variables, especially because the sampling units were relatively high in number. In addition, this approach saved the researcher the hustle of hunting for respondents more than once.

This study was a one-shot case study (Nachmias & Nachmias, 1995), also known as a single-case study (Yin, 1989), because it involved the observation of a single group or event at a single point in time, usually subsequent to some phenomenon that allegedly produces change. Yin (1989) defines a case study as an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident and in which multiple sources of evidence are used. He further explains that case studies are the preferred research strategies when 'how' or 'why' questions are being asked and when the investigator has little control over the events. Yin (1989) further points out that case studies allow an investigation to retain the holistic and meaningful characteristics of real-life events such as individual life-cycles, community change and business processes.

Yin (1989) continues to advise that case studies are suitable in examining contemporary events in which the relevant behaviors cannot be manipulated by the researcher, and the main sources of evidence are direct observation and systematic interviewing. Leedy & Ormrod (2005) explain that researchers opt to study a single case because its unique or exceptional qualities can promote understanding or inform practice for similar situations. In its entirety, we can describe the proposed design as a survey case study, because structured questionnaires will be used to collect primary data

3.3 Population

Marascuilo & Serlin (1988) define population within the context of research studies as the basic unit of interest that includes all people, objects and concepts for which the sample can be considered representative. Basically, the entire set of relevant units of analysis or data (Nachmias & Nachmias, 1995). It is of importance for the target population to have the observable characteristics from which the researcher intends to draw generalizations. The study's target population was composed of all mobile phone users within Kibera slum. Currently, the Communications Commission of Kenya does not have any documented empirical data on the exact number of mobile phone users within Kibera slum. However, using the secondary data

from the CCK referred to earlier in the literature review, on the rapid adoption of mobile phone technology, we can deduce that this technology is as popular in Kibera as it is within the rest of the country, especially with the advent of low-cost mobile phone handsets.

3.4 Unit of Analysis and Unit of Observation

The unit of analysis is the specific social entity about which data will be gathered and empirical claims made while the unit of observation is the unit on which one collects data (Hoyle, Harris & Judd, 2002). Therefore, the unit of analysis in this research was mobile phone usage while the unit of observation was the individual mobile phone user residing within Kibera slum.

3.5 Sample size

Marascuilo& Serlin (1988) define a sample as the sub-population in the experiment or research that can be considered representative of the entire population. Nachmias & Nachmias (1995) describe a sample as the sub-set of the population from whom data will be collected to enable the researcher gain a basis for generalizations. A single member of the sampling population is known as a sampling unit. Leedy & Ormrod (2005) state that the sample should be so carefully chosen that, through it, the researcher is able to see all the characteristics of the total population in the same relationship that they would have been seen, were the researcher to examine the total population. The study comprised of a sample size of 200 mobile users residing within Kibera slum. The sample units were be required to be between 21 and 60 years of age and must have lived within Kibera slum for at least two years. This was to help improve accuracy and representativeness.

3.6 Sampling Design

The sampling design employed both quantitative and qualitative sampling methods. Teddlie & Yu (2007) state that, the use of mixed methods of sampling, though fairly recent, enable the researcher to generate a sample that will address the research questions. They highlight that combining well-established qualitative and quantitative sampling techniques in creative ways when selecting the units of study, increases both generalizability and inference quality. The study employed both stratified sampling and purposive sampling to enhance the representativeness of its findings.

Stratified samples ensured that different groups of a population were adequately represented in the sample so as to increase their level of accuracy when estimating parameters. Most importantly, it considerably reduced the cost of execution. Stratified sampling involves the use of available information on the population to divide it into groups known as strata's. The elements in each stratum should be more alike within the stratum than are the elements in the population as a whole. Stratification contributes to the efficiency of a sample and accuracy. This is so only if it succeeds in establishing strata's that are internally comparatively homogenous with respect to the characteristics being studied, such that when the samples are combined, they constitute a sample of a more heterogeneous population. When the total number of elements in each stratum is different, it is advisable to use a disproportionate stratified sample rather than a proportionate stratified sample, where that sample size drawn from each stratum is proportionate to the population size. Disproportionate stratified samples are accomplished by weighting the figure for each stratum in such a way that it contributes to the score for the total sample, in proportion to its size in the population (Nachmias & Nachmias, 1995; Hoyle, Harris & Judd, 2002).

As noted earlier, KNBS (2010), during the 2009 population and housing census, found that Kibera slum is sub-divided into seven villages, namely Kibera, Lindi, Makina, Siranga, Laini Saba, Gatwikira and Kyanda with a total population of 170, 078. Further, the census report also enumerated the number of residents per village as Kibera – 9,786, Lindi – 35,158, Makina – 25,242, Siranga – 17,363, Laini Saba – 28,182, Gatwikira – 24,991 and Kyanda – 29,356. Consequently, these sub-divisions made stratified sampling a suitable method for data collection; hence every village was taken to represent a stratum. Since the total number of elements in each stratum was different, disproportionate stratified sampling was applied to determine how many mobile users were needed from each strata, to attain a sample size of 200 individuals. The formula below was used:

$$\text{No. of sampling units needed per stratum} = \frac{\text{Total no. of elements in the stratum}}{\text{No. of elements in entire population}} \times \text{Sample Size}$$

This formula yields the following results: Kibera – 12, Lindi – 41, Makina – 30, Siranga – 20, Laini – 33, Gatwikira – 29 and Kyanda – 35 elements, totaling to sample size of 200 elements. To ascertain a random selection of sampling units within each village, the research team, from the assumed mid-point of each village, moved in the North and South, East and West directions.

In addition, sample units selected were at least 10 meters apart. This enhanced the selection of a random and representative sample.

Having achieved the above, purposive sampling, which involves selecting sampling units subjectively in an attempt to obtain a sample that is representative of the population, was used to select sampling units that were satisfactory vis-a-vis the study's needs (Nachmias & Nachmias, 1995; Hoyle, Harris & Judd, 2002). In this case, the individual had to have resided within Kibera slum for at least two years, be aged between 21- 60 years and must have owned and used a mobile phone for at least one year. To ensure gender equity within the sample, the research team alternated between male and female respondents, when selecting interviewees. This technique was chosen due to the absence of a reliable sampling frame, which would have facilitated probability sampling.

3.7 Sources of Data

Data for this study was sourced from both primary and secondary sources. Primary data included information collected from respondents within the sample via structured questionnaires and information gathered from key informants such as M-Pesa dealers, 'Simu ya Jamii' vendors and scratch-card vendors, who will be purposively selected. Secondary data from different sources was also be incorporated, more specifically, the national census results for Kibera slum, mobile phone- related statistics from CCK and any other secondary data that was relevant to the study.

3.8 Data Collection Techniques

Data was collected via a descriptive survey research (Leedy & Ormrod, 2005), where respondents within the sample were subjected to semi-structured, face-to-face interviews. This was done by the researcher, with the help of carefully selected and trained research assistants, who were guided by a structured questionnaire. The questionnaire comprised of both open and closed-ended questions. Closed-ended questions helped provide structured responses for the rating of various attributes, while open-ended questions helped provide additional information that was relevant, but may not have been captured by the closed-ended questions. Questionnaires help conserve time and money as well as facilitating easier data analysis. Yin (1989) says that interviews are an essential source of evidence because most case studies are about human affairs. Human affairs should be reported through the eyes of specific interviewees and well informed respondents who can provide insight into a situation.

Survey research usually involves acquiring information about a group of people by asking them questions, tabulating and statistically analyzing the responses and the drawing inferences about a particular population from the responses of the sample (Leedy & Ormrod, 2005). Further, a pilot study was carried out to, among other things, test the questionnaire with a few members of the population and consequently make any necessary adjustments. This enhanced the validity and accuracy of the data that was collected.

3.9 The Pilot Study

In reality, a researcher may sometimes have to do a brief exploratory investigation or pilot study, to try out particular procedures, measurement instruments or methods of analysis. It is an excellent way to determine the feasibility of one's study. It helps save time during the actual data collection as you will have already identified which approaches will or will not help you solve your research problem (Leedy & Ormrod, 2005). Yin (1989) explains that this is because pilot studies help a researcher reveal inadequacies in the initial design. It also aids in questionnaire design/redesign as it highlights the questions that either need to be amended or dropped all together, thereby leaving the relevant line of questions in the questionnaire. Consequently, one is able to refine the data collection plans with respect to content of the data and procedures to be followed.

Moreover, pilot studies make access to the site easier because one would already be familiar with the route. Noting that Kibera is an informal settlement, it was important to know the routes that are convenient and safe for the researcher and data collection team to use. The pilot study brought to light areas in the key informants' questionnaire that needed readjust. It was noted that some of the questions were repetitive, therefore, some of the questions were deleted and others were re-framed. The pilot study also revealed that the weekend was more fruitful for data collection.

3.10 Data Analysis and Presentation

Before employing statistical analysis techniques, the completed questionnaires were organized, responses edited and tallied for completeness and consistency. The quantitative data collected was analyzed by the use of descriptive statistics using SPSS (Statistical Package for Social Sciences) and presented through measures of central tendency, measures of variability and measures of correlation. The qualitative data was coded thematically and then analyzed

statistically. Content analysis was used to analyze responses from the open-ended questions and responses from the key informants' questionnaire. The information was presented in form of graphs, charts and in prose form. Interpretation of the data was done in line with the study objectives and assumptions.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter provides information on the findings of the study as set out in the research methodology. The data was gathered exclusively from a survey research in which the respondents completed a semi-structured questionnaire, designed in line with the research objectives.

4.2 Response Rate

The study targeted 200 respondents who have resided within Kibera slum for at least two years, are aged between 21-60 years and have owned and used a mobile phone for at least one year. The study's response rate was 100% with 200 out of the 200 sampled respondents duly completing and returning the questionnaires. This reasonable response rate was achieved through the avid effort of the researcher and data collection team, who made personal contact with each respondent and patiently waited as they filled-in the questionnaires. The data collection team carried out this exercise on weekends, that is, Saturday's and Sunday's only, over a period of three weeks. This is because the pilot study showed that majority of the residents of Kibera slum would be available and willing to participate in the research over the weekend.

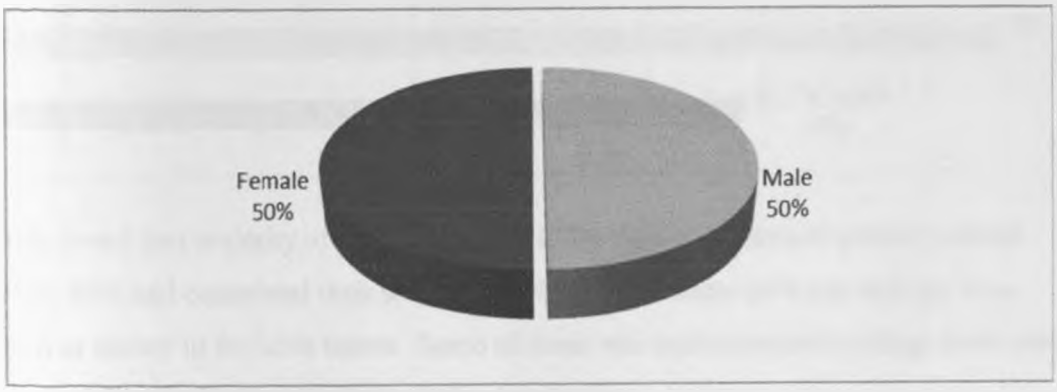
A total of 20 key informants were also interviewed, specifically to help provide deeper insight into the relationship between the adoption of mobile phone technology and entrepreneurship. The response rate for the key informants was also 100%. Those interviewed included mobile money transfer agents, mobile airtime hawkers, community phone vendors and mobile phone repair technicians.

4.2 Demographic Information

This section highlights the demographic characteristics of the respondents as retrieved from the questionnaires. These characteristics are gender, age, marital status, level of formal education completed, occupation, monthly income and period of residency in Kibera.

As noted in the research methodology section, the researcher sought to ensure a gender balance within the sample. This was made possible by purposely alternating the gender of the respondents when handing out the questionnaires, thereby resulting in a gender-balanced and representative sample as shown in figure 4.1 below.

Figure 4.1: Gender Distribution



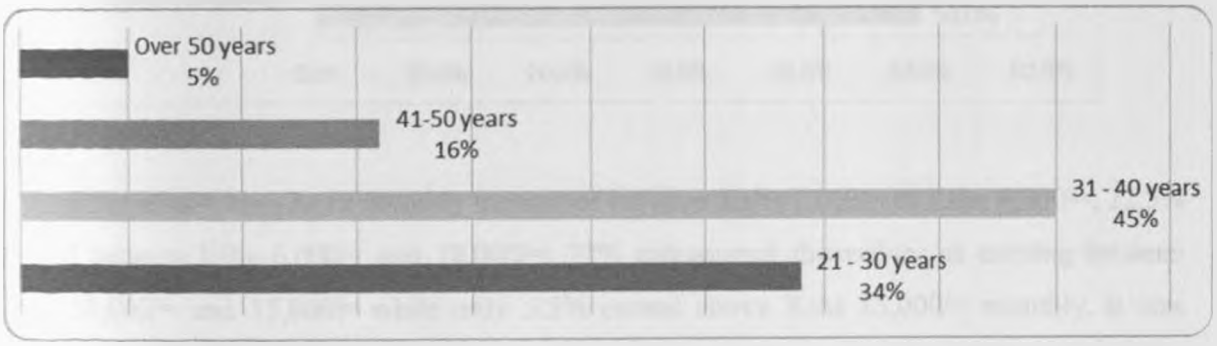
The study found that 44.5% of the respondents were married, 23.5% of the respondents were single, 11% of the respondents were widowed, similarly 11% of the respondents were divorced and 10% were separated from their spouses, as shown in the table below.

Table 4.1: Marital Status

Marital Status	Frequency	Percent
Married	89	44.5
Single	47	23.5
Divorced	22	11
Widowed	22	11
Separated	20	10
Total	*200*	*100*

Majority of the respondents (45%) were aged between 31-40 years, followed closely by those aged 21-30 years (34%). Respondents aged 41-50 years and those over 50 years comprised 16% and 5% respectively, as illustrated in figure 4.2. Majority of the residents being aged between 21 years and 40 years can be attributed to the fact that these years are the most productive in one's life. therefore, this age group is interested in living close to their places of work or places where the potential for gainful employment is high.

Figure 4.2: Age Distribution



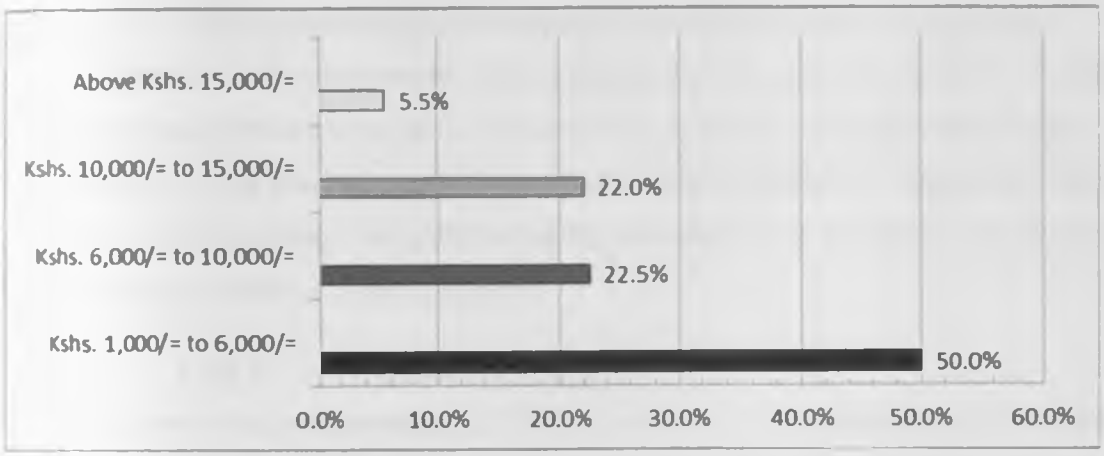
The study found that majority of the respondents (92%) had only attained primary school education, 88% had completed their secondary school and a mere 20% had college level education as shown in the table below. Some of those who had completed college level revealed that they had attended tertiary colleges and polytechnics.

Table 4.2: Level of Formal Education Completed

Level of Education	Frequency	Percent
Primary	92	46
Secondary	88	44
College	20	10
Total	*200*	*100*

In response to the query on occupation, the respondents indicated their various income earning activities as follows; househelps, watchmen, construction site workers, employees in various industries, casuals (who took up whatever jobs were available), self-employed (business persons), baby-sitters, cashiers, city council employees, waiters/waitresses and hawkers of various merchandise.

Figure 4.3: Total Monthly Income



Half of the respondents had a monthly income of between Kshs 1,000/= to Kshs 6,000/=, 22.5% earned between kshs 6,000/= and 10,000/=, 22% categorized themselves as earning between Kshs 10,000/= and 15,000/= while only 5.5% earned above Kshs 15,000/= monthly. It was interesting to find that all our respondents had some sought of income because Kibera is thought to be a slum where the unemployed reside.

Table 4.3 Period of Residing in Kibera Slum

Period of Residency	Frequency	Percent
1-5 years	70	35
6-10 years	85	42.5
11-15 years	30	15
16-20 years	12	6
Above 20 years	3	1.5
Total	*200*	*100*

In line with our methodology, we purposely sampled respondents who had resided in Kibera slum for over a period of two years. According to the findings, 42.5% of the respondents had been residents of Kibera slum for 6-10 years, 35% for 1-5 years,15% for 11-15 years, 6% for 16-20 years while 1.5% of the respondents had been residents of Kibera slum for above 20 years.

4.3 Analysis and Interpretation of Findings vis-à-vis the Research Objectives

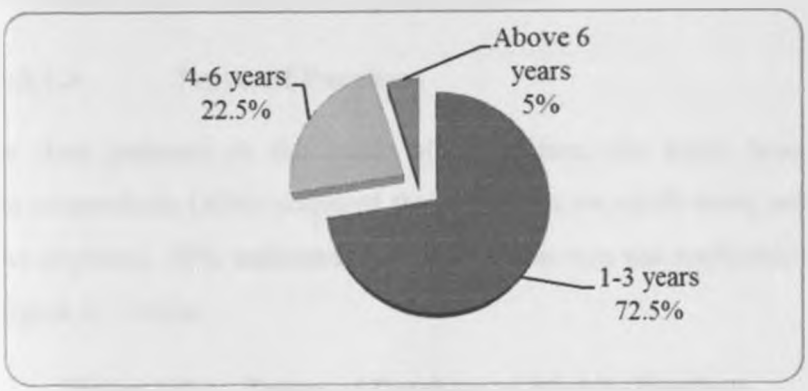
4.3.1 Factors Influencing the Adoption of Mobile Phones in Kibera Slum

The first objective of the study was to find out what factors influenced the adoption of mobile phone technology within Kibera slum. To realize this objective, it was inquired from the respondents how long they had owned their mobile handsets, the mode of acquisition, the terms of purchase, purchase price, their preferred tariff, ownership status and lastly, what factors they prioritize when purchasing a mobile handset.

4.3.1.1 Period of Ownership

The study showed that a large majority, 72.5% to be precise, of the respondents had owned and used their mobile handsets for 1-3 years. A limited number (5%) had owned their handsets for over 6 years, while an average number (22.5%) had owned them for 4-6 years.

Figure 4.4: Years of Owning a Mobile Phone



These findings support the particulars derived from the reviewed literature, which highlighted that the advent of cheaper mobile handsets has encouraged the purchase and subsequent adoption of mobile phone technology in low-income communities such as Kibera slum. In Kenya, low cost handsets made their debut approximately 4 years ago.

4.3.1.2 Mode of Acquisition

The study found that, half of the respondents had acquired the mobile phone from their employers, with monthly deductions of its cost from their salary, 35% of the respondents received their handsets from their employers as a tool of trade, which is to be surrendered if employment ceases. Only 11% of the respondents had acquired their mobile phones by

purchasing it from a mobile phone shop/dealer while a mere 4% of the respondents been given their mobile phones, at no cost, by a relative or friend. This is summarized in table 4.4 below.

Table 4.4: Mode of Acquiring Mobile Handsets

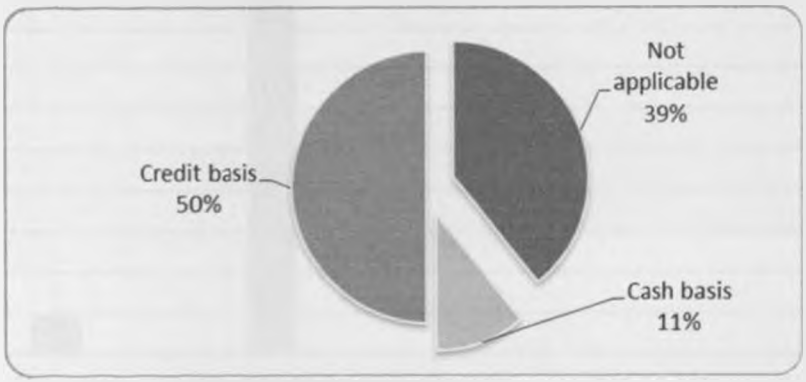
Mode of Acquisition of Mobile Phones by Respondents	Frequency	Percent
Bought it from a mobile phone shop	22	11
Given at no cost by a relative or friend	8	4
From employer as a tool of trade, which is to be surrendered if employment ceases	70	35
From employer, with monthly deductions of its cost from my salary	100	50
Total	*200*	*100*

These statistics indicate that 85% of the respondents own mobile phones courtesy of their employers. Being in employment is therefore a major determinant of mobile handset ownership. This is explained further by the fact that all the respondents in the sample were found to have somewhat of an income as shown earlier in figure 4.3 above.

4.3.1.3 Terms of Purchase

In line with the data gathered on the mode of acquisition, the study found that a higher proportion of the respondents (50%) acquired their handsets on credit basis, while 11% bought them for cash. As expected, 39% indicated that the question was not applicable to them. This is summarized in figure 4.5 below.

Figure 4.5: Terms of Purchase of Mobile Handsets



4.3.1.4 Costs Incurred in Purchase of Mobile Handset

Since 39% of the respondents did not spend any money in acquiring a mobile phone, then it is expected that a similar percentage will indicate that the question on cost is not applicable to them as shown in figure 4.5 below. Half of the respondents spent between Kshs 4,000/= to 9,000/= to acquire their phones, while only 11% spent less than Kshs 1,000/=.

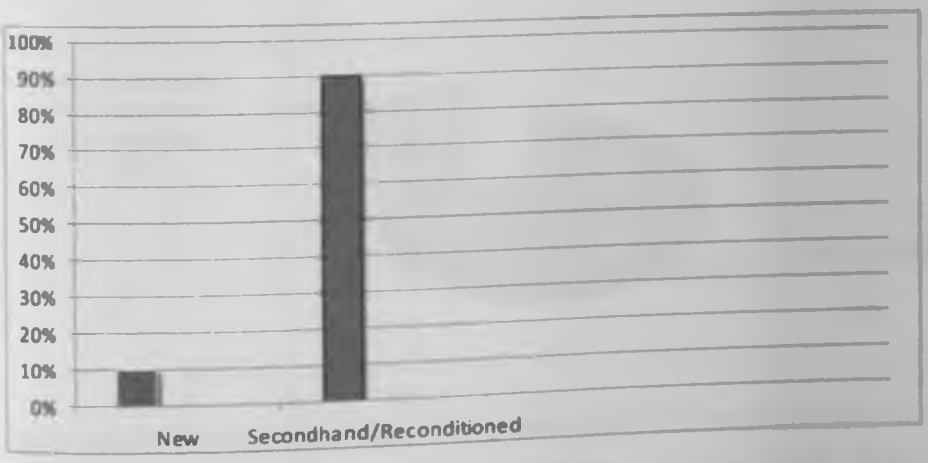
Table 4.5: Approximate Cost of Acquiring a Mobile Phone

Cost	Frequency	Percent
Less than Kshs 1,000/=	22	11
Kshs 4,000/= - Kshs 6,000/=	44	22
Kshs 7,000/= - Kshs 9,000/=	56	28
Not applicable	78	39
Total	*200*	*100*

4.3.1.5 State of the Phone on Acquisition

As shown in figure 4.6 below majority of the respondents indicated that their handsets were either second-hand or reconditioned when they acquired them, while a small minority of 10% purchased or received new handsets. This shows that the state of the phones, whether new or used, is not of major significance in the acquisition of mobile phone within Kibera.

Figure 4.6 State of the Mobile Phone on Acquisition



4.3.1.6 Preferred Tariff and Ownership Status

A pre-paid tariff was the tariff of choice for 89% of the respondents as shown in table 4.6. However, 11% of the repondents had a post paid tariff. Some of the respodents added that having a post paid tariff was due to the nature of their work and that it was sponsored or courtesy of their employers.

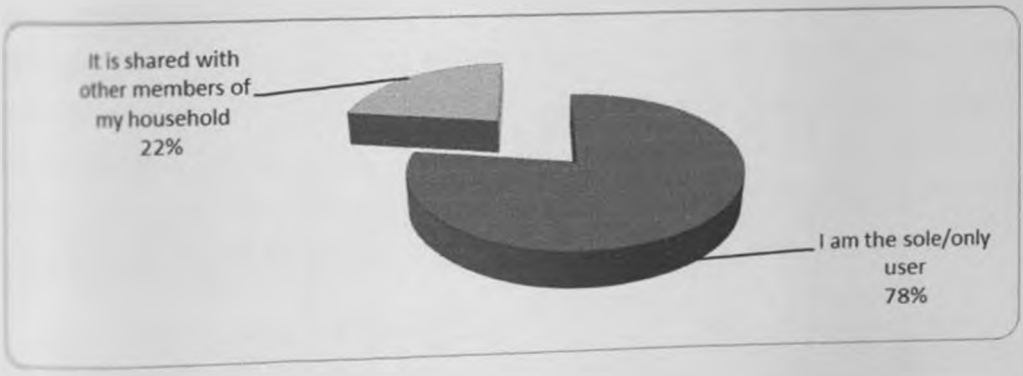
Table 4.6: Preferred Tariff

Tariff	Frequency	Percent
Pre-paid	178	89
Post-paid	22	11
Total	*200*	*100*

The choice of a pre-paid tariff for majority of the mobile phone users goes to show that the introduction of a pre-pay option has positively influenced the adoption of mobile phones in Kibera slum. Further, the availability of low denominations of mobile phone airtime such as Kshs 5/= and 10/=, has made it easier for these communities not only to own but also maintain their mobile phone service.

The study also found that 78% of the respondents were the sole users of their mobile phones while 22% shared theirs with other members of their households.

Figure 4.7: Mobile Phone Ownership Status



These further supports the hypothesis that mobile phone technology has been adopted to a great extent in Kibera slum. Most of the respondents did not have to share their mobile handsets because other members of their households had their own.

4.3.1.6 Preferred Tariff and Ownership Status

A pre-paid tariff was the tariff of choice for 89% of the respondents as shown in table 4.6. However, 11% of the repondents had a post paid tariff. Some of the respodents added that having a post paid tariff was due to the nature of their work and that it was sponsored or courtesy of their employers.

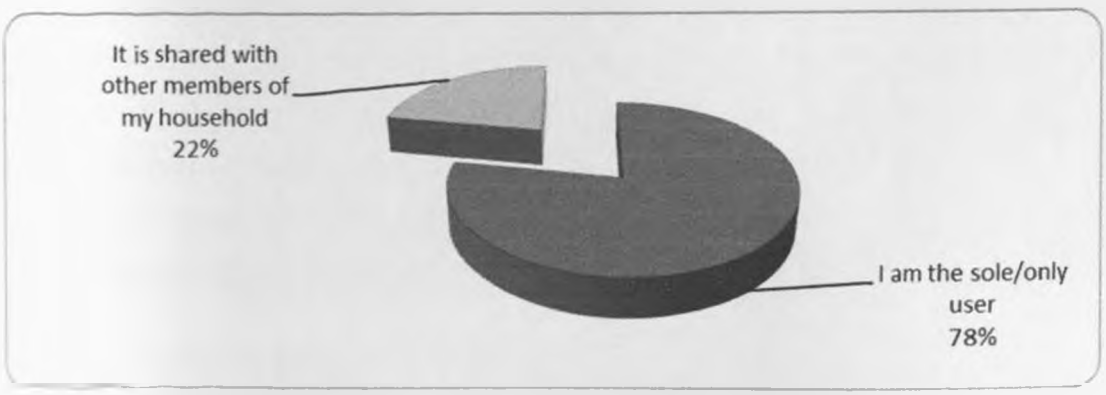
Table 4.6: Preferred Tariff

Tariff	Frequency	Percent
Pre-paid	178	89
Post-paid	22	11
Total	*200*	*100*

The choice of a pre-paid tariff for majority of the mobile phone users goes to show that the introduction of a pre-pay option has positively influenced the adoption of mobile phones in Kibera slum. Further, the availability of low denominations of mobile phone airtime such as Kshs 5/= and 10/=, has made it easier for these communities not only to own but also maintain their mobile phone service.

The study also found that 78% of the respondents were the sole users of their mobile phones while 22% shared theirs with other members of their households.

Figure 4.7: Mobile Phone Ownership Status



These further supports the hypothesis that mobile phone technology has been adopted to a great extent in Kibera slum. Most of the respondents did not have to share their mobile handsets because other members of their households had their own.

4.3.1.7 Factors Influencing Decision to Acquire a Mobile Phone

Table 4.7 below shows the findings on the extent to which various attributes of a mobile phone influence the purchase decision of the respondents.

Table 4.7: Degree to which Various Factors Influence Acquisition of Mobile Phone

Factors Influencing Acquisition of Mobile Phones	No Extent	Little Extent	Moderate Extent	Great Extent	Very Great Extent	*Mean*	*Std. Dev.*
Price	3	1	6	24	56	*3.99*	*0.2*
Brand/Model	6	4	12	24	64	*4.66*	*0.4*
Physical appearance (It's look)	1	2	23	67	7	*3.77*	*0.7*
Additional features such as radio, internet or camera	1	1	32	64	2	*3.65*	*0.3*
Opinion of relatives and/or friends	1	3	57	33	6	*3.40*	*0.3*
Quality	1	5	4	17	73	*4.56*	*0.6*
Ease of use	1	3	6	22	68	*4.53*	*0.4*
After-sale service/Guarantee	2	3	5	23	67	*4.50*	*0.8*
Advertisements in the media	3	3	4	32	58	*4.39*	*0.6*
Special offers on handsets from mobile phone service providers & dealers	2	2	6	32	58	*4.42*	*0.8*

In response to the question on the attributes of a mobile phone that they deem to be most important when making a purchase decision, the respondents rated the brand/model, quality of the phone, ease of use, after-sale-services, special offers on handsets and advertisements in the media respectively, as factors influencing them to a great extent. The respondents further rated price, the phone's look, additional features on the handset and opinions of family and friends respectively as factors that influence them moderately, when making a purchase decision. It was interesting and surprising to find that price did not greatly influence the purchase decision, yet Kibera slum mostly houses low-income earners as shown in figure 4.3.

4.3.2 Various Uses of the Mobile Phones in Kibera Slum

The second objective of this research was to identify the various functions of the mobile phone within Kibera slum. The respondents indicated only two main uses their mobile phones. The first was for comunication with family, friends and colleagues and the second for money transfer services

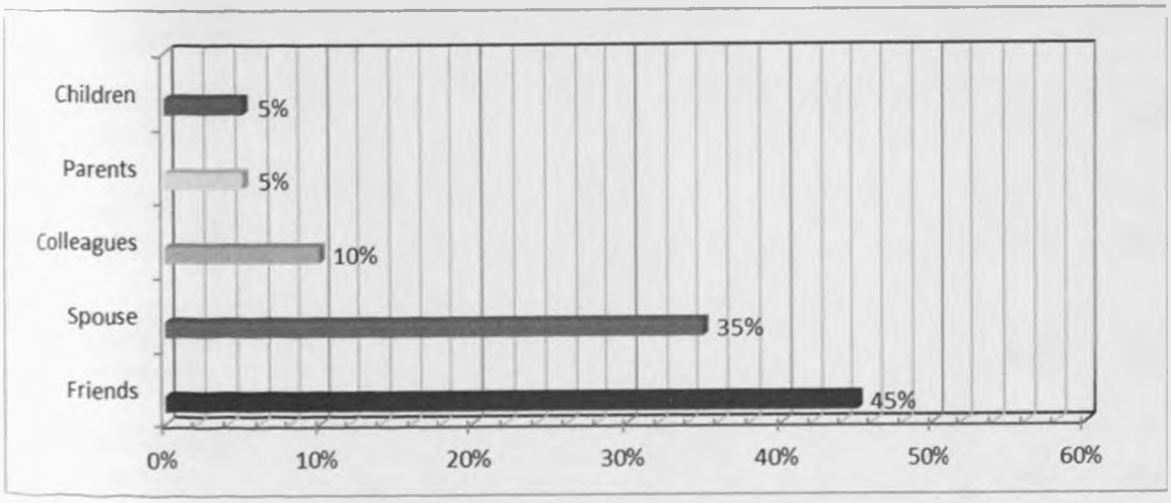
4.3.3 Effects of Mobile Phones on Various Types of Social Interaction in Kibera

The third objective sought to determine the effects that mobile phone usage has had on various types of social interaction within Kibera slum. To determine this, the respondents were asked which social groups they most frequently interacted with via mobile phones, in addition to finding out the extent to which various elements of their social interaction had been affected by the adoption of mobile phone technology.

4.3.3.1 Frequency of Mobile Phone Communication within Social Groups

Majority of the respondents indicated that most of the mobile phone interaction they have is with friends or spouses at 45% and 35% respectively. Mobile phone interaction with colleagues was at 10%, while one's parents or children each scored 5%. This shows that most of the communication that takes place via mobile phones is informal and of a social nature.

Figure 4.8: Frequency of Communication via Mobile Phones with Various Social Groups in Kibera Slum



4.3.3.2 Effects of Adoption of Mobile Phones on Interaction in Kibera

Table 4.8: Effects of Interaction via Mobile Phone on Various Social Aspects in Kibera Slum

As a result of adopting and using my mobile phone.....	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Mean	Std. Dev.
I feel safer and more secure	3	3	4	26	64	**4.45**	**0.6**
I am more accessible to relatives and friends	2	3	18	72	5	**3.75**	**0.7**
I have reduced the number of times I travel upcountry to visit relatives	6	4	24	64	12	**4.02**	**0.4**
It is easier to co-ordinate everyday life between home and work	1	3	22	68	6	**3.75**	**0.4**
I am able to deal with home or work emergencies more efficiently and effectively	2	4	15	72	7	**3.78**	**0.6**
I have become more social and I have more friends	1	2	2	21	74	**4.65**	**0.7**
The relationship with my spouse/fiancée/lover has improved	3	4	24	64	7	**3.74**	**0.1**
The relationship with my children has improved	2	14	4	23	57	**4.19**	**0.5**
The relationship with my colleagues at work has improved	6	4	12	24	64	**4.66**	**0.4**
Conflicts within my family have decreased	1	2	23	67	7	**3.77**	**0.7**
Conflicts at my work place have decreased	2	3	5	23	67	**4.50**	**0.8**

As shown by the findings in table 4.8 above, majority of the respondents agreed that the adoption and use of mobile phone technology has improved the relationship with their colleagues and has decreased workplace conflicts. These scored a mean of 4.66 and 4.50 respectively. Most of the respondents also agreed that with the advent of mobile phone communication, they have become more social and thereby have more friends. This is supported by the summary of findings in figure 4.8 above, which show that 45% of mobile phone communication is with friends .The study also showed that mobile phone technology has relatively reduced the number of times the respondents travel upcountry to visit relatives. The reduction in travel can be as a result of being able to keep in touch regularly with family or friends via mobile phone and also the ability to disburse funds to them via mobile money transfer. In addition, the respondents also indicate that the relationship with their children has improved.

However, respondents were somewhat neutral, that is, they neither agreed nor disagreed on whether the adoption of mobile phone communication had improved the relationship with their spouses/fiancées/lovers and also on whether mobile phones helped them coordinate everyday life, between home and work. Respondents also indicated that they were relatively neutral on whether owning a mobile phone has made them more accessible and on whether it has reduced family-related conflicts and also on whether they were able to deal with work and home emergencies more efficiently and effectively.

4.3.3.3 Effects of Mobile Phone Adoption on Face-to-Face Interaction

Figure 4.9: Extent to which Mobile Phone Adoption Reduces Face-to-Face Interaction in Kibera Slum

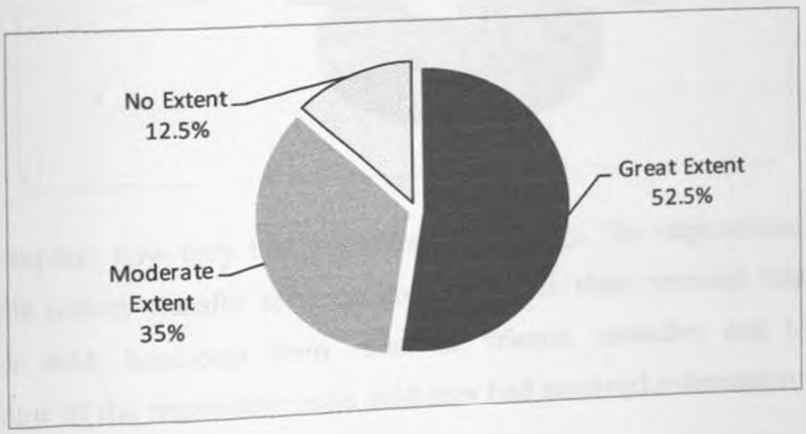


Figure 4.9 shows a summary of the study's findings in relation to the extent to which the adoption of mobile phone technology reduces face-to-face interaction between family and friends. Most of the residents, more specifically, 52.5% of the respondents indicated that face-to-face interaction has reduced to a great extent, while 35% indicated that it has reduced by a moderate extent. However, for 12.5% of the respondents, face-to-face interaction with family and friends had not reduced even with the introduction of mobile phone technology.

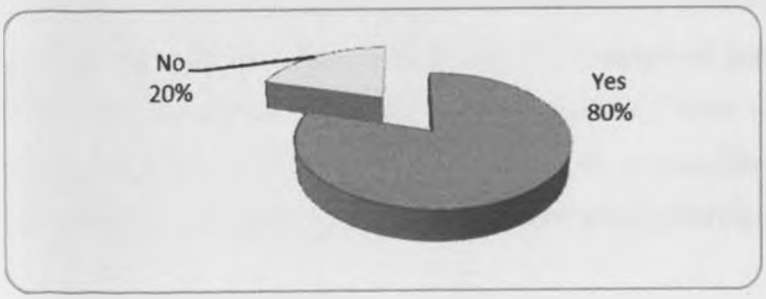
4.3.4 The Mobile Phones Influence on Innovation and Job Creation in Kibera Slum

The last objective was to find out how mobile phone technology had influenced innovation and job creation within Kibera slum. This was determined by establishing from the respondents the extent to which they had benefitted financially from the adoption of mobile phones, the extent to which employment opportunities had increased within Kibera and the mobile phone related innovations that may have mushroomed, owing to the introduction of mobile phones.

4.3.4.1 Financial Benefits Accruing from the Adoption of Mobile Phones

The findings show that it is widely held that the adoption of mobile phone technology within Kibera slum has brought with it financial benefits. Figure 4.10 indicates that 80% of the respondents agreed while 20% indicated that they have not financially benefitted from the adoption of mobile phones.

Figure 4.10 Extent to which Adoption of Mobile Phones Accrues Financial Benefits in Kibera Slum



When asked to explain how they had benefitted financially, the respondents said that it was mostly via mobile money transfer services through which they received wages, payment for goods bought or sold, hand-outs from relatives, friends, churches and non-governmental organizations. Some of the respondents also said they had received information on job vacancies

(mostly casual jobs) via their mobile phones from friends or industries where they had left their contacts when inquiring on employment opportunities. Respondents also indicated that the adoption of mobile phones has encouraged saving by way of informal saving groups such as merry-go-rounds ("chamas") and self-help groups. The respondents explained that collection and safe storage of funds had become easier to co-ordinate with the introduction of mobile money transfer

4.3.4.2 Mobile Phone Adoption and New Ventures within Kibera Slum

The study sought to find out if the introduction of mobile phones in the last couple of years has encouraged residents of Kibera slum to start-up mobile phone-related ventures/businesses. According to the findings, 72.5% of the respondents indicated that introduction of mobile phones has encouraged residents of Kibera slum to start mobile phone-related ventures/businesses while 27.5% of the respondents indicated that introduction of mobile phones did not encourage residents of Kibera slum to start mobile phone-related ventures/businesses.

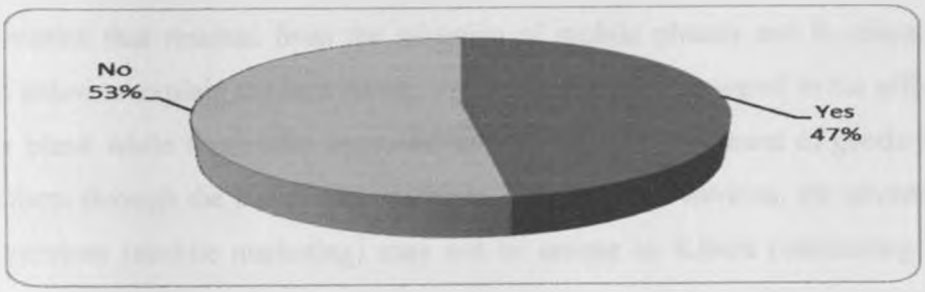
Table 4.9: Degree to which Mobile Phone Adoption has Encouraged New Ventures

Response	Frequency	Percent
Yes	145	72.5
No	55	27.5
Total	*200*	*100*

The respondents who answered in the affirmative listed businesses they aware of, which had been established as a result of the introduction of mobile phones in Kibera slum. They listed airtime hawkers and vendors, mobile money transfer agents, commercial bank agencies which transacted via mobile phones, community mobile phone vendors ("simu ya jamii"), mobile phone handset dealers and mobile phone repair shops. This goes to show that entrepreneurship within the slum has relatively increased with the introduction of the mobile phone and related services.

4.3.4.3 Mobile Phone and Employment Opportunities within Kibera Slum

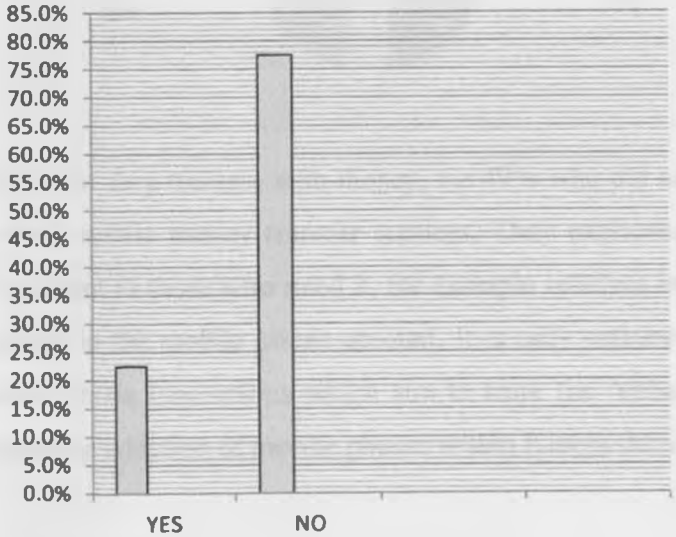
Figure 4.11: Degree to which Mobile Phone Adoption has Increased Employment Opportunities in Kibera Slum



The study sought to determine whether the adoption of mobile phone technology has resulted in an increase of employment opportunites for Kibera residents. Respondents were almost split down the middle with their responses but eventually 53% indicated that employment opportunities had not increased while 47% indicated otherwise. The findings are summarized in figure 4.11 above. The effects of mobile phones being conduits of employment creation may not yet be felt within Kibera slum as they are felt within the city.

4.3.4.4 Mobile Phone Adoption and Innovations Unique to Kibera Slum

Figure 4.12: Innovations Unique to Kibera Slum Resulting from Mobile Phone Adoption

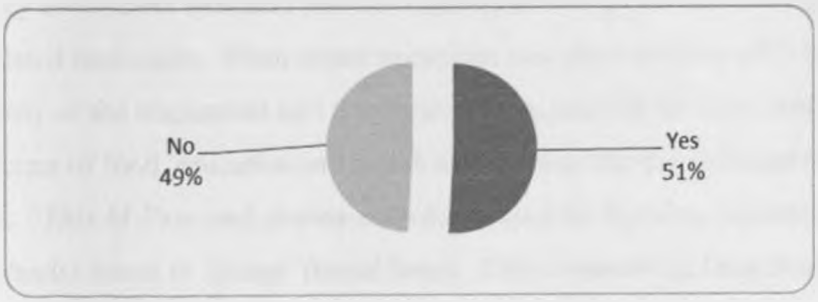


The study sought to find out if there was a mobile phone related innovation(s) that resulted from the adoption of mobile phones that is unique to Kibera slum. The findings showed that 77.5% of the respondents indicated that they were not aware of mobile phone related innovation(s) unique to Kibera slum while 22.5% of the respondents indicated that they were aware mobile phone related innovation that resulted from the adoption of mobile phones and is unique to Kibera slum. When asked to explain the innovation, some of those who answered in the affirmative left the question blank while those who answered said that the advertisement of goods by business people in Kibera through the phone was unique to Kibera slum. However, the advertisements of goods and services (mobile marketing) may not be unique to Kibera considering that it is a marketing tool, which in the recent past has prevalently been used by marketers in the country.

4.3.4.5 Mobile Phone and Ownership of Bank Accounts by Kibera Residents

The finding summarized in figure 4.13 below show that 51% of the respondents hold bank accounts in commercial banks while 49% do not hold commercial bank accounts.

Figure 4.13: Ownership of Bank Accounts in Commercial Banks by Kibera Residents



When asked to explain how they transact with money, the 49% who did not hold bank accounts indicated that they used mobile money transfer services. They explained that when need be, money is deposited and sent to those who need it, for example relatives in the rural areas while the remaining is retained in the mobile phone account. It is only withdrawn when need arises. This shows that mobile phone innovations which aim to bank the "unbanked" in low income communities have aided the adoption of mobile phones within Kibera slum.

4.4 Summary of Findings from Key Informant Interviews

Key informants, mainly comprising of respondents who operated mobile phone related business, were interviewed with a view to obtaining additional qualitative data to assist in fulfilling the study objective, which sought to find out the extent to which mobile phone adoption has influenced innovation and job creation.

The key respondents comprised of mobile money transfer agents, mobile airtime hawkers, mobile phone repair technicians and community phone vendors. It was found that majority of the businesses had been in existence for between 1 and 3 years. This goes to show that mobile phone related businesses had increased with an increase in the adoption of mobile phones in Kibera.

The study also found that majority of the key respondents the respondents did not engage in other business prior to the introduction of mobile phone technology in Kibera slum, a few however had ran other businesses unrelated to the mobile phone and only set-up their current ventures because demand for mobile related services had increased. From the foregoing, it can be deduced that the adoption of mobile phone technology within Kibera slum has encouraged the mushrooming of mobile phone related business in the past few years.

Several of the key informants indicated that the standard of living had improved due to engaging in the mobile related businesses. When asked to explain how their standard of living had improved, majority of the respondant said they were able to provide for their families better particularly in terms of food, education and health care. One of the key informants excitedly informed us that, "*This M-Pesa and airtime shop has helped me build my parents a wooden and 'mabati' (iron sheets) house in 'gicagi' (rural home). This is something I had dreamt of doing for a long time, kwa sababu nililelewa kwa nyumba ya matope (because they brought us up in a mud house)*". . However, they were those who said that there had not been any significant improvement in their standard of living.

Many of the businesses were ran by the proprietors only without the assistance of any other employees. The few businesses which had salaried employees to assist the proprietor were money transfer businesses, which had been in existance for sometime. Most of these had one employee each. The key informants said that this was because having an employee would reduce their overall earnings.

From the above findings, it is clear that the adoption of mobile phones within Kibera slum has positively influenced entrepreneurship within Kibera slum, thereby bringing economic development to the area. It is unfortunate however, that this did not result in a significant increase in employment opportunities.

4.5 Data Collection Challenges

The following challenges were encountered during the data collection process:

- Use of sheng language or what the respondents called 'lugha ya mtaa' (a language unique to the slum, that is a combination of the national language kiswahili and different vernacular langauges). The data collection team had to constantly request for the translation of some of the phrases for clarity. This also unnnecessarily increased the amonut of time we had to spend with some of the respondents.

- Some of the respondents did not allow us to hold the interviews in their houses, so we settled for the outdoors. However, this seemed to attract a small crowd of curious on-lookers/idlers, who distracted the respondent and made them uncomfortable to respond to some of the personal questions such as level of income.

- Some of those we sought to include in our sample, insisted on exchanging their information for money, even after issuing them with the institutions letter of introduction. However, we only interviewed those who voluntarily completed the questionnaire.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes the study's findings and draws conclusions and recommendations, based on the research objectives. This study aimed to investigate the socio-economic impact that the adoption of mobile phone technology has had on the residents of Kibera slum.

5.2 Summary of Findings and Conclusions

This study concludes that the introduction and adoption of mobile phone technology within Kibera slum has had a significant impact on the socio-economic development of the slum's residents. The fact that the researcher was able to find 200 respondents of either gender, who owned mobile phones with ease, goes to show that Kibera slum residents have indeed adopted mobile phone technology. This is also an indicator of mobile phone technology being of some benefit to them in one way or the other. If it was not so, then they would not have purchased the device in relatively large numbers, as is the case currently.

Regarding the factors that influence the adoption of mobile phone technology within Kibera slum, it was established from the findings that the availability of credit facilities from various quarters is crucial for the diffusion of this technology within low-income communities such as Kibera slum. More so, if employers can offer credit facilities, whereby employees can have the cost of a handset deducted in installments from their income. Half of the respondents had acquired their handsets in this manner as shown in table 4.4. Further, as implied by the literature review, the availability of low cost handsets is also a key factor in influencing the adoption of mobile phone technology within low-income communities such as Kibera slum, owing to the fact that 50% of the respondents spent between Kshs 4,000/= and Kshs 9,000/= only ($40-$90) when purchasing their handsets. The study further noted that with regard to the mode of acquiring a mobile phone (Table 4.4), the 4% who indicated that they had received their phones from a relative or friend at no cost were all women.

The advent of low-cost handsets, which flooded the Kenyan mobile phone market in the recent past, has greatly aided the rapid diffusion of this technology within low-income urban slums. The findings support this statement as shown in figure 4.4 where 72.5% of the respondents had

owned a handset for only 1 to 3 years. Low cost handsets have more often than not been previously owned, then reconditioned by the manufacturer or mobile phone technicians and resold at a subsidized cost. However, they are brands which offer low-cost models with minimum features to enable penetration into low-income markets. The findings showed that a massive 90% of the respondents owned secondhand or reconditioned handsets because they were more affordable.

The convenience of having access to pre-paid tariffs has also facilitated the adoption of mobile technology in Kibera slum. Pre-paid tariffs enable a mobile phone user to load their phones with airtime before usage. Pre-paid tariffs eliminate the hassle and bureaucracy involved in dealing with monthly bills, in addition to offering a 'plug and play' technology, where a mobile phone user purchases a sim-card from an authorized dealer, slots it into the mobile phone sim space and in a matter of seconds, it is activated and ready for use. The introduction of low-denomination airtime has also influenced diffusion of mobile phone technology. One can buy airtime for as low as Kshs 5/= or Kshs 10/= and make a call for up to five minutes or send an unlimited number of short messages (SMS), depending on the service provider of choice. It is therefore not surprising that 89% of the respondents preferred a pre-paid tariff. A section of the 11%, who opted for the post-paid tariff, indicated that it was courtesy of their employer, because the mobile handset they owned was given to them as a tool of trade that was to be surrendered if employment ceases.

In addition to the foregoing, the privacy that mobile phone technology provides when one is communicating is another factor that seems to have aided its adoption Kibera slum. The findings showed that 78% of the respondents were the sole users of their handsets. This provided the privacy and freedom to call or text their contacts without intrusion, from any place and at any time. These findings are also indicative of the fact that low-cost handsets have enabled several members of the same household to each own a mobile phone, rather having only one handset which is to be shared among the family members

The findings summarized in figure 4.2 shows that 79% of the respondents were aged between 21 – 40 years; an age group society refers to as the youth. This age group usually tends to be brand conscious in their consumption patterns, more so when it comes to technology, such as mobile phones. It therefore was not surprising to find that even in Kibera slum, the brand and quality of a mobile handset were the attributes that were rated the highest, when respondents were asked

what influenced their purchase decision vis-à-vis their mobile phones. Those within this age group are generally very fashion and class conscious. Since brands are symbols of the same, it then expected that the brand of a phone was considered an important factor in making the purchase decision, by Kibera slum residents. An additional explanation would be that, certain brands are known to be more reliable than others and have a greater utilitarian value to the user.

It was interesting to note that the findings showed only two main uses of mobile phones among the respondents. These were communication and mobile money transfer. This supports the notion that the introduction of mobile phone communication has brought about change in the patterns of interaction within various social systems. With the introduction of mobile money transfer services, mobile phones have become agents of economic development in the lives of those who use them. As pointed out in the literature review, users can deposit, withdraw and send money within and across borders, using this wireless technology.

It is apparent that various types of social interaction have metamorphosed due to the social dynamics that mobile phones have introduced into the society's communication patterns. The findings summarized in table 4.8 indicate the that the adoption of mobile phone technology has enhanced communication particularly in the workplace, thereby reducing conflicts and fostering better relationships between the respondents and their colleagues. Evidence also points to the fact that interaction via mobile phones has made the respondents more social and consequently, they have more friends. However, the use of mobile phones has to a great extent reduced the traditional face-to-face interaction, as shown in the findings where 52.5% of the respondents said that they had reduced face-to-face interaction to a great extent. It can be concluded therefore that the use of mobile phones has made social interaction between members of different social systems relatively impersonal. This is because people can effectively communicate without necessarily being in the same space.

The study has shown that mobile phone adoption has brought economic development to the residents of Kibera slum. This is evidenced by the findings shown in figure 4.10, where 80% of the residents said that they have benefited financial from the adoption of the mobile phone technology. The respondents credited this financial development to the mobile money transfer innovation, which has enabled them manage their personal and business finances in a more formal and secure manner. The respondents who did not own bank accounts in commercial

banks indicated that the mobile money transfer innovation served as their bank account and enabled them transact similar to those who owned commercial bank accounts. A number of respondents said that they had received information on and invitations for employment via their mobile phones. Those who were self-employed indicated that mobile phones have enhanced the timeliness of their business transactions; thereby helping them ran more efficient and effective businesses.

Further, the study findings showed that 72.5% of the respondents agreed that the introduction of mobile phone technology had encouraged the burgeoning of new ventures within Kibera slum. They identified these ventures or businesses as mobile airtime hawking, mobile money transfer vendors, mobile phone repair shops, community mobile phones ("simu ya jamii") and commercial bank agencies. However, only 47% indicated that mobile phone adoption had led to the increase in employment opportunities. Majority of the respondents (77.5%) said that they did not know of any innovation that was unique to Kibera, which had arisen from the adoption of mobile phones.

The findings from the key informants, who operated businesses within Kibera slum, evidenced that mobile phone adoption has significantly stimulated entrepreneurship. The proliferation of mobile phone technology within Kibera, created a 'need gap' for airtime, mobile money transfer agencies, community mobile phones, phone repair shops amongst others services. The entrepreneurs within Kibera seized the opportunity to satisfy these needs and set up appropriate businesses. The findings showed that majority of these businesses have been in existence for between 1 to 2 years. These findings support the claim that the introduction of low-cost mobile handsets in the recent past, catalyzed the diffusion of mobile technology in low-income communities.

The study also showed that majority of the key informants did not run any other business prior to their current mobile related business. This can be interpreted to mean that the adoption of mobile phone technology has encouraged entrepreneurs to start their own businesses. It's was encouraging to note that a relatively large number of the key informants agreed that their standard of living had significantly improved. They explained that the income earned from their businesses has enabled them provide for their families basic needs with much more ease. It was

sad to note however, that several of the key informants had not hired any employees. The proprietors ran the businesses alone.

In light of the above, we can conclude that the two hypotheses proposed in chapter two of this research study, are probably true. There is a positive relationship between the adoption of mobile phones and the improvement of social interaction within urban slums. There is also a positive relationship between the adoption of mobile phone technology and entrepreneurship in urban slums. that is, mobile phone adoption has fostered entrepreneurship. It is clear from the findings that both social interaction and entrepreneurship in Kibera slum has improved, with the adoption of mobile phone technology.

5.3 Recommendations

There is a positive relationship between adoption of mobile phone technology and socio-economic development in Kibera, therefore, the stakeholders in the telecommunications sector should endeavour to introduce other low-cost forms of technology such as computers or laptops ob credt basis, which could further social and economic development in Kibera. This would in turn raise the standard of living for the slums residents and move the nation towards fulfilling their millenium goals of eradicating poverty.

Technical experts in the ICT sector should also engage in further research to enable them design social innovations, such as mobile money transfer services, which help solve various problems in the low-income communities within our society. Employers should also partner with mobile phone handset manufacturers or dealers, to enable them offer credit facilities to the customers who would wish to own mobile handsets, but can only do so on credit basis.

The government and non-governmental instituions invovled in innovation and entrepreneurship training, should design programs which will serve to impart business management skills to the existing and potential entreprenuers within Kibera slum. This knowledge will help them increase the productivity of their businesses, thereby helping to created additional employment opportunities within the slum. The stakeholders in the ICT sector, more so the mobile phone service providers, can incorporate this kind of training in their corporate social responsibility. Since the findings showed that mobile phones improve social interaction, the government and

other relevant groups such as those justice and reconciliation, can use the mobile phone to solve conflicts and encourage people to live peaceably with each other.

5.4 Suggestions for Further Studies

This study sought to assess the socio-economic impact that the usage of mobile phone technology has had on the residents of Kibera slum, within Nairobi County. Additional research can therefore be carried out to assess the impact that mobile phone technology has on other aspects of society such as culture, religion, or marriage. Comparative studies can also be carried out to assess the impact of mobile phone technology between other urban slums and low-income communities such as Mathare, within the country. Research could also be carried out on the impact of other forms of technology in different strata's of society. Academicians can also look into other social and economic factors not explored by this study, such as the effects of mobile phone on trust and fidelity in marriage or the influence of mobile phones on deviant behaviour in teenagers.

APPENDICES

APPENDIX 1: STRUCTURED QUESTIONNAIRE

Location:.....

Date:.....

Serial Number:.....

1. **Gender**

   Male [ ] Female [ ]

2. **Marital Status**

   Married [ ] Single [ ] Divorced [ ] Widowed [ ] Separated [ ]

3. **Age**

   [ ] 21 – 30 years [ ] 31 – 40 years [ ] 41 – 50 years [ ] Over 50 years

4. **What is the last level of formal education that you completed?**

   Primary Level [ ] Secondary Level [ ]

   College Level [ ] Other [ ] If other, specify.....

5. **Occupation**.....

6. **Approximately, what is your total Monthly Income?**

   No Income [ ] Below Kshs 1,000/= [ ]

   Kshs 1,000/= - Kshs 5,000/= [ ] Kshs 5, 001/= - Kshs 10,000/= [ ]

   Kshs 10,001/= - Kshs 15,000/= Above 15,000/= [ ]

7. **For how long have you been a resident of Kibera slum?**

---------- Years

OBJECTIVE 1 – FACTORS INFLUENCING ADOPTION OF MOBILE PHONES

8. **For how long have you owned a mobile phone?** .....Years

9. **(a) How did you acquire your mobile phone?**

i. [ ] Bought it from a mobile phone shop

ii. [ ] Given, at no cost, by a relative or friend

iii. [ ] From employer as a tool of trade, which is to be surrendered if employment ceases

iv. [ ] From employer, with monthly deductions of its cost from my salary

v. [ ] Other, specify.....

(b) If answer above is (□), you purchased your mobile phone on

[ ] Cash basis [ ] Credit basis

10. **Approximately, how much did you spend when purchasing your mobile phone**

[ ] Less than Kshs 1,000/= [ ] Kshs 1,000/= – Kshs 3,000/=

[ ] Kshs 4,000/= - Kshs 6,000/= [ ] Kshs 7,000/= – Kshs 9,000/=

[ ] Kshs 10,000/= and above

11. **When purchasing/receiving your mobile phone it was**

[ ] First-hand/New [ ] Second-hand/Reconditioned

12. **My mobile phone is on a tariff that is**

[ ] Pre-paid [ ] Post-paid

13. With regard to ownership and daily use of my mobile phone handset...

[ ] I am the sole/only user

[ ] It is shared with other members of my household

14. To what extent do the factors below influence your decision to acquire a mobile phone?

Use a scale of 1 to 5 where 1 is to A VERY GREAT EXTENT and 5 is to NO EXTENT.

Factors Influencing Acquisition of Mobile Phone	**1**	**2**	**3**	**4**	**5**
Price					
Brand/Model					
Physical appearance (It's look)					
Additional features such as radio, internet or camera					
Opinion of relatives and/or friends					
Quality					
Ease of use					
After-sale service/Guarantee					
Advertisements in the media					
Special offers on handsets from mobile phone service providers & dealers					

OBJECTIVE 2 – VARIOUS USES OF THE MOBILE PHONES

15. Starting with the most frequently used, state the various purposes for which you use your mobile phone.

i. ---------- iv. ----------

ii. ---------- v. ----------

iii. ---------- vi. ----------

OBJECTIVE 3 – EFFECTS OF MOBILE PHONES ON SOCIAL INTERACTION

16. **Rate the following people in order of those you communicate with most via mobile phone.** ***Use a scale of 1 to 7, with 1 being the person(s) you communicate with most and 7 being the one(s) with whom you communicate with the least.***

.....Spouse **.....Colleagues**

.....Children **.....Friends**

.....Parents

.....Employer/Employees *(if in business)*

17. **With regard to your daily interaction with people using your mobile phone, indicate using (√), the extent to which you agree or disagree with the phrases below.**

As a result of adopting and using my mobile phone.....	**Strongly Agree**	**Agree**	**Neither Agree nor Disagree**	**Disagree**	**Strongly Disagree**
I feel safer and more secure					
I am more accessible to relatives and friends					
I have reduced the number of times I travel upcountry to visit relatives					
It is easier to co-ordinate everyday life between home and work					

I am able to deal with home or work emergencies more efficiently and effectively					
I have become more social and I have more friends					
The relationship with my spouse/fiancée/lover has improved					
The relationship with my children has improved					
The relationship with my colleagues at work has improved					
Conflicts within my family have decreased					
Conflicts at my work place have decreased					

18. To what extent has the use of mobile phone resulted in a reduction of face-to-face encounters with your family and friends?

[ ] To a great extent

[ ] To a moderate extent

[ ] To no extent

OBJECTIVE 4 – MOBILE PHONES INFLUENCE ON INNOVATION & JOB CREATION

19. a) Have you, in anyway, benefited financially from the adoption of mobile phones within Kibera slum?

[ ] Yes [ ] No

b) If answer above is YES, explain how----------

---

20. Has the introduction of mobile phones in the last couple of years encouraged residents of Kibera slum to start mobile phone-related ventures/businesses?

[ ] Yes [ ] No

b) If answer above is YES, list the businesses of this type that you know of ----------

---

---

21. Has the introduction of mobile phones within Kibera slum increased the opportunities for employment?

[ ] Yes [ ] No

22. a) Is there a mobile phone related innovation (s) that resulted from the adoption of mobile phones and is unique to Kibera slum?

[ ] Yes [ ] No

b) If answer above is YES, list the innovation and its function ----------

---

---

21. a) Do you have a bank account in any of the country's commercial banks?

[ ] Yes [ ] No

b) If answer above is NO, explain how you transact with money----------

---

APPENDIX 2: KEY INFORMANTS QUESTIONNAIRE

1. Describe the mobile phone related business or businesses that you are currently running in Kibera slum? For how long have you run it/them?

2. Prior to the introduction of the mobile phone, did you own another business in Kibera slum?

   [ ] Yes [ ] No

3. a) Has the mobile phone related business improved your standard of living?

   [ ] Yes [ ] No

   b) If answer above is YES, please explain how

4. a) Have you employed anyone to help you run your business?

   [ ] Yes [ ] No

   b) If answer above is YES, how many employees do you have?

REFERENCES

Agar. J. (2003), Constant Touch: A Global History of the Mobile Phone. Icon Books, Cambridge, UK

Ahonen, T. (2007), Communities Dominate Brands: Mobile, the 7th Mass Media, is to Internet like TV is to Radio. Available at http://communitiesdominate.blogs.com/brands/2007/02/mobile_the_7th.html

Aker. J. C. & Mbiti, I. M. (2010), Mobile Phone & Economic Development in Africa. Journal of Economic Perspectives, Vol. 24, No. 3, pg. 207-232.

Barros, P. P. & Cadima, N. (2001), The Impact of Mobile Phone Diffusion on the Fixed Line Network. Available at http://ppbarros,fe.unl.pt/My%20Shared%20Documents/BarrosCadima.pdf

BEACON Project (2005), The BEACON Knowledge-base (Project Report D1.1). Available at: www.ovum.com/beacon/deliverables.asp (Accessed 23 June 2009).

Bhavnani, A., Chiu, R. W. W., Janakiram, S. & Silarszky, P. (2008), The Role of Mobile Phones in Sustainable Rural Poverty Reduction. ICT Division, World Bank Working Paper 44678

Central Bank of Kenya (2009), FinAccess National Survey 2009: Dynamics of Kenya's Changing Financial Landscape. Available at http://www.fsdkenya.org/finaccess/documents/09-06-10_FinAccess_FA09_Report.pdf

Conci, M., Pianesi, F. & Zancanaro, M. (2009), Useful, Social & Enjoyable: Mobile Phone Adoption by Older People. Proceedings of the Human Computer Interaction – INTERACT 2009 Conference, Uppsala, Sweden

Corbett, A. (2009), Cellular Phones Influence(s) and Impact(s) on Social Interactions and Interpersonal Relationship. Sociological Perspectives, 14th Ed, University of New Hampshire, Durham, NH. Available at http://www.unh.edu/sociology/media/pdfs_journal2009/Corbett2009.pdf

Communications Commission of Kenya, CCK (2010), Annual Report 2008/2009. CCK, Kenya.

CCK (2010), Quarterly Sector Statistics Report, 2nd Quarter. CCK, Nairobi

CCK (2009), Communications Statistics Report 2008. CCK, Nairobi

CCK (2008) Communication Statistics Report. CCK, Nairobi

CCK & Netcom Information Systems Ltd (2007), Internet Market Analysis Study: Final Report. CCK, Nairobi

CCK (2005), Annual Report 2004/5. CCK, Nairobi

DeKerckhove, D. (1995), The Skin of Culture: Investigating the New Electronic Reality. Sommerville House, Toronto. pp. 7-13.

De Souza e Silva (2008), Cell Phone Use Among Low Income Communities- An Initial Study of Technology Appropriation in the Favelas of Brazil. Vodafone Receiver Magazine, Issue No. 20. Available at
http://www.receiver.vodafone.com/cell_phone_use_among_low_income_communities

Donner, J. (2005), The use of Mobile Phones by Micro-entrepreneurs in Kigali, Rwanda: Changes to Social & Business Networks. Paper presented at Wireless Communication and Development. A Global Perspective Annenberg Research Network on International Communication Workshop, 7-8 October 2005.

Dutta, S. & Mia, I. (2008), Global Information Technology Report 2008/9: ICT for Sustainability. World Economic Forum and INSEAD, Switzerland. Available at: http://www.networkedreadiness.com/gitr/main/fullreport/index.html (Accessed on December 2 2010).

Eagle, N. (2005), Entrepreneurship and Education Through Mobile Phones in Kenya. MIT, Cambridge, MA. Available at http://web.media.mit.edu/~nathan/africa_nokia.pdf

Etzo, S. & Collender, G. (2010), "The Mobile Phone Revolution in Africa: Rhetoric or Reality?", African Affairs, Oxford Journals, vol. 109, Issue 436. pp. 5-6.

Ford, M., Batchelor, J. (2007), "From zero to hero – is the mobile phone a viable learning tool for Africa?", 3rd International Conference on Social and Organizational Informatics and Cybernetics (SOIC). Orlando, GA, 12-15 July available at:

Frempong, G.K., Essegbey, E.O., Tetteh, E.K. (2007), Survey on the Use of Mobile Telephones for Micro and Small Business Development: The Case of Ghana. STEPRI, Accra. pp. 12-19.

Gikenye, W. & Ocholla, D. (2010), The Diffusion and Impact of Mobile Phones on the Informal Sector in Kenya. 11th DIS Annual Conference 2010, 2nd-3rd Sep., University of Zululand, Richardsbay, SA

GoK/UNHABITAT (2005), Kibera Social and Economic Mapping: A Household Survey. Research International Ltd, Nairobi.

Gough, N., Grezo, C. (2005), "Africa: The impact of mobile phones", The Vodafone Policy Paper Series, No.2. pp. 132-144.

Government of Kenya, GoK (2005), National Poverty Eradication 2005-015.Goverment of Kenya printers, Nairobi.

Gruber, H. & Koutroumpis, P. (2010), Mobile Telecommunications and the Impact on Economic Development. Economic Policy, 52nd Panel Meeting C.E.P.R

Haddon, L. (2001), Domestication and Mobile Telephony. Paper presented at the conference 'Machines that Become Us', Rutgers University, New Jersey, US, 18-19 April.

Hall, B.H. & Khan, B. (2003), Adoption of New Technology. Working Paper 9730, national Bureau of Economic Research. Cambridge, MA

Harding , A. (2002), Nairobi Slum Life: Escaping Kibera. BBC News, World Report. Available at: http://news.bbc.co.uk/2/hi/africa/2297279.stm (Accessed on 23 November 2010)

Holt, D. H. (1992), Entrepreneurship: New Venture Creation. Prentice Hall, India.

Hoyle, R. H., Harris, M. J. & Judd, C. M. (2002), Research Methods in Social Relations, 7th ed. Thomson learning Inc., US.

International Telecommunication Union, ITU (2009), Information Society Statistical Profiles 2009: Africa. International Telecommunication Union

ITU (2008a), African Telecommunication/ICT Indicators 2008: At A Crossroads. International Telecommunication Union, Geneva.

ITU (2008b), ICT Basic Data. International Telecommunication Union, Geneva.

Karanja, J. et al (2002), A Study of Awareness of Malaria Among Kibera Population: Implication for Community Based Intervention. Bulletin of National Institute of Public Health, Vol 51, Iss.1, pg. 51-55.

Kenya National Bureau of Statistics, KNBS (2010), 2009 Kenya Population and Housing Census, Volume 1A: Population Distribution by Administrative Units. KNBS, Nairobi. Pg. 34

Kling, R. (1996), Computerization and Controversy: Value Conflicts and Social Choices, 2nd Ed. Academic Press, San Diego, CA

Kerlinger, F. N. (1964), Foundations of Behavioral Research: Educational and Psychological Inquiry. Holt, Rinehart and Winston, Inc., USA

Ling, R. (2004), The Mobile Connection: The Cell Phone's Impact on Society. Morgan Kaufmann Publishers, CA, USA

Leedy, P. D. & Ormrod, J. E. (2005), Practical Research: Planning and Design, 8th ed. Pearson Prentice Hall, New Jersey.

Ling, R. (2000), The Impact of the Mobile Phone on Four Established Institutions. Paper presented at the ISSEI 2000 Conference of the International Society for the Study of European Ideas, Bergen, Norway, 14-18 August.

Linna, P. & Richter, U. (2011), Technology Entrepreneurship – Potential for Social Innovation? The Case of Kenyan Mobile Industry Companies. International Journal of Business and Public Management, Vol. 1, No. 1, April 2011. Available at http://www.mku.ac.ke

Mabogunje, A.L. (1980), The Development Process: A Spatial Perspective. Hutchinson & Co. Ltd., London.

Marascuilo, L. A. & Serlin, R. C. (1988), Statistical Methods for the Social and Behavioral Sciences. W. H. Freeman and Company, USA.

McLuhan, M. (1964), Understanding Media: The Extensions of Man. Mentor Books, New York. pg. 299-313.

Mitullah, W. (2003), Understanding Slums: Case Studies for the Global Report on Human Settlements 2003: The Case of Nairobi, Kenya. UNHABITAT, Nairobi.
Mulumba, J. A. (2004), Health status of people of slums in Nairobi, Kenya. Environmental Research, Vol. 96(2), pg. 219-227.

Must, B. & Ludewig, K. (2010), Mobile Money: Cell Phone Banking in Developing Countries. Policy Matters Journal, Vol. 7, No.2, University of California

Mwangi, C. B. F. (2007), The Impact of Mobile Technologies on Micro and Small Enterprises/Jua Kali . Presented on Dec 15-17, 2007, India to Communication Policy Research on National and Regional Innovation Systems

Nachmias, C. F. & Nachmias, D. (1995), Research Methods in the Social Sciences, 5th ed. Hodder Arnold. Great Britain

Omwansa, T. (2009), M-Pesa: Progress and Prospects. Mobile World Congress 2009

Parsons, T. (1997), "Kibra Is Our Blood": The Sudanese Military Legacy in Nairobi's Kibera Location, 1902-1968. The International Journal of African Historical Studies, Vol. 30, No. 1 (1997), pp. 87-122

Pedersen, E. (2001), Adoption of Mobile Phone Commerce: An Exploratory Analysis. Telecommunications Economics Program, report No. 51/01. Foundation for Research in Economics and Business Administration.

Porter, M. E. & Schwab, K. (2009), Global Competiveness Report 2008/9. World Economic Forum, Switzerland. Available at: https://members.weforum.org/pdf/GCR08/GCR08.pdf (Accessed 2 December 2010)

Postman, N. (1993), Technopoly: The Surrender of Culture to Technology. Vintage Books, New York. pp. 32-41.

Rangaswamy, N. & Nair, S. (2010), The mobile Store Phone Ecology in a Mumbai Slum Community: Hybrid networks for Enterprise. Anneberg School for Communications and Journalism Journal. Vol. 6, No. 3, fall 2010, Pg. 51-65

Reding, V. (2006), "Broadband Access: The New Highways to Prosperity", paper presented to the Conference on Bridging the Broadband Gap through EU Spectrum Policy, Brussels, 27 march 2006, Available at: http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/06/200&format=HTML&aged=1&language=EN&guiLanguage=en (Accessed 25 October 2009)

Rice, R. & Katz, J. (2003), "Comparing Internet Adoption and Mobile Phone Usage: Digital Divides of Usage, Adoption, and Dropouts", Telecommunications Policy, Vol. 27, No.8-9, pp.597-623.

Richardson, D., Ramirez, R. & Haq, M. (2000), Grameen Telecoms Village phone Program in Rural Bangladesh: A Multi-media Case Study, Final Report. Telecomms Development Group, Canada. Available at http://www.t-forum.org/mausklick/background/Grameenfinalreport.pdf

Rogers, E. M. (1995), Diffusion of Innovations, 4th ed. Free Press, Newyork

Rosenlund, L. (1992), Taste. An Introduction to Pierre Bourdieu's Sociology, Report 4. Rogalandsforskning, Stavanger, Norway as quoted by Cawley, A. & Hynes, D. (2010) "Evolving Mobile Communication Practices of Irish Teenagers", Aslib Proceedings, Vol. 62, Iss. 1, Pg. 29-45.

Safaricom (2011), M-Pesa Key Performance Statistics. Available at http://www.safaricom.co.ke/fileadmin/M-Pesa/Documents/Statistics/M-Pesa_Statistics_Jan2011.pdf

Sahin, I. (2006), Detailed Review of Roger's Diffusion of Innovations Theory and Educationa; Technology-Related Studies Based on Rogers Theory. The Turkish online Journal of Educational Technology. Vol. 5. Issue 2, Article 3, April 2006. Available at http://www.tojet.net/articles/523.pdf

Schuringa, W. & Kodo, T. (1997), Tenancy and Sanitation Provision in Informal Settlements in Nairobi: Revisiting the Public Latrine Option. Environment and Urbanization, Vol. 9, No. 2, Pg.181. Available at http://eau.sagepub.com/content/9/2/181 (Accessed 1 December 2010).

Scott, N., Batchelor, S., Ridley, J., & Jorgensen, B. (2004), "The impact of mobile phones in Africa", report prepared for the Commission for Africa. Available at: www.commissionforafrica.org/english/report/background/scott_et_al_background.pdf (Accessed 9 December 2009). Pg. 44-59.

Shrum et al (2011) Mobile Phones and Core Network Growth in Kenya: Strengthening Weak Ties. Social Science Research, Vol. 40(2011), Iss. 2, Elsevier. Available at http://www.worldsci.net/YSSRE1236.pdf

Silverstone, R. & Haddon, L. (1996), Design and the Domestication of ICTs: Technical change and Everyday life. Oxford University Press Inc., Newyork.

Skog, B. (2002), Mobiles and the Norwegian Teen: Identity, Gender and Class. Cambridge University Press, New York. pp. 68-69.

Subhash, B., Dewan, A, Torres, M. M. & Kanungo, P. (2007), Grameen Telecom: The Village Phone Program. World Bank Empowerment Case Studies. Available at http://siteresources.worldbank.org/INTEMPOWERMENT/Resources/14648_Grameen_web.pdf

Teddlie, C. & Yu, F. (2007) Mixed Methods Sampling: A Typology With Examples. Journal of Mixed Methods Research Vol. 1, No. 1. Sage Publications. Available at http://jmmr.sagepub.com

Thomas, L. W. (1995) Sociology: The Sociology of Human Relationships, 5th ed. Holt, Rinehart and Winston, Austin, USA

UN-HABITAT (2007) Millennium Development Goals and Urban Sustainability: State of the Worlds Cities 2006/7. UN-HABITAT, Nairobi

Vochin, A. (2009), History of Mobile Phones: Evolution of Two –Way Radios to iPhone 3Gs. Softpedia, USA

Vodafone (2005), Africa:The Impact of Mobile Phones. The Vodafone Policy Paper Series,No. 2

Waema, T. & Kashorda, M. (2002), Final Report on Kenya ICT Infrastructure E-Readiness. GOK, Nairobi

Wambugu, S. (2011), Mobile Phones to Offer Health Sector the Kiss of Life. *The Sunday Nation*, April 10, 2011, pg. 33

Waverman, L., Meschi, M., & Fuss, M. (2005), "The impact of telecoms on economic growth in developing countries", The Vodafone Policy Paper Series, Vol. 2. pp. 10-23.

Weiner, M. (ed.) (1996), Modernization: The Dynamics of Growth. VOA forum Lectures, Washington D. C.

Wejnert, B. (2002), Integrating Models of Diffusion of Innovations: A Conceptual Framework. Annual Review of Sociology (Annual Reviews) 28: 297–306. doi:10.1146/annurev.soc.28.110601.141051. JSTOR 3069244.

www.enablingchange.com.au/Summary_Diffusion_Thoery.pdf

www.safaricom.co.ke

Yin, R. K. (1989), Case Study Research: Design & Methods. Sage Publications, CA, USA.