

**NEW MEDIA AND BUSINESS: ADOPTION AND USE OF MOBILE PHONE
TECHNOLOGY SERVICES IN EMPOWERING WOMEN ENTREPRENEURS IN
MACHAKOS COUNTY**

**BY
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DECLARATION

This thesis is my original work and has not been presented for a degree award in any other University.

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This dissertation has been submitted for examination with our approval as university supervisors.

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DEDICATION

To my late parents, William and Hannah Mutisya, who encouraged and supported their children to attain the highest level of education.

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LIST OF ABBREVIATIONS

ARPU	:	Average Revenue per Person User
CBFW	:	Cherie Blaire Foundation for Women
CCK	:	Communications Commission of Kenya
CDMA	:	Code Division Multiple Access
DSL	:	Digital Subscriber Line
ECCA	:	European Cable Communication Association
GOK	:	Government of Kenya
GSM	:	Global System of Mobile Communication
GSMA	:	Global System for Mobile Communication Association
ICT	:	Information and Communication Technologies
ITU	:	International Telecommunication Union
KCB	:	Kenya Commercial Bank
KNBS	:	Kenya National Bureau of Statistics
MDG	:	Millennium Development Goals
MMS	:	Multimedia Messaging Services
MNO	:	Mobile Network Operator
MT	:	Mobile Technology
OECD	:	Organization for Economic Cooperation and Development
SMEs	:	Small and Medium Enterprises
SMS	:	Short Message Service
TAM	:	Technology Acceptance Model
TV	:	Television Network
UN	:	United Nations
UNDAW	:	United Nations Division for the Advancement of Women
USAID	:	United State Agency for International Development
WAP	:	Wireless Application Protocol
WEP	:	Women Enterprise Fund
WSIS	:	World Summit on the Information Society
MTS	:	Mobile Technology Services

ABSTRACT

This study sought to investigate the adoption and use of mobile technology for the empowerment of women entrepreneurs in Machakos County. It sought to investigate why, despite the worldwide knowledge of the boost to entrepreneurship that the use of mobile phone services have done, women entrepreneurial activities still lag behind in terms of more profit and growth. The study had the following specific objectives; i) To assess the extent of adoption and usage of mobile phone technology to empower women entrepreneurs in Machakos county, ii) To find out factors that influence the adoption and use of mobile technology services by women entrepreneurs in Machakos County, iii) To investigate the role of communication and information flow in the adoption and use of mobile phone technology. The study used three theories: Uses and Gratifications theory, Technology Acceptance Model and Empowerment theory. The study used mixed method design. Systematic random sampling was used to select 350 respondents. Survey method was used to collect quantitative data. Quantitative data was analyzed using descriptive statistics and then presented in tables, figures and bar graphs. Purposive sampling was used to select 8 key informants and participants in the focus groups discussions. In-depth interviews and interview guide were used to collect qualitative data. Qualitative data was analyzed thematically and presented in narrative form. The study found out that women entrepreneurs have accepted the mobile phone as an important tool for running their businesses but they were not using all the services of the mobile phone and especially the advanced applications. They mostly use the mobile phone for voice calling and SMS services and shy away from the advanced ones. There is a disconnect between the ‘roll out’ of an innovation and how the entrepreneurs adopt and use it. This is because the stakeholders underscore the value of communication process and information flow in the ‘roll out, of a new innovation from the implementation stage all the way to the adoption process. The study recommends that any mobile service application being ‘rolled out’ to the entrepreneurs should have the communication and information flow context in it. This will lead to adoption and use which will result to more income, more skills and exposure to more markets thereby improving their wellbeing hence being empowered.

CHAPTER ONE

INTRODUCTION

1.0 Background to the Study

The term new media encompass the emergence of computerized, digital or networked information and communication technologies in the late part of the 20th century. Most new technologies described as “New media” are digital, often having characteristics of being manipulated, networked, compressible, interactive and impartial (Herrington, 2009).

Some examples of new media are: internet, mobile phones, websites, computers, compact disc read-only memory (CD-ROM) and digital video discs (DVDs). New media have the ability to combine text, audio, digital video, interactive multimedia, virtual reality, the web, email chat and personal digital assistant (PDA) computer applications, and any source of information accessible by a personal computer (World Bank Release, 2012). According to Hanz (2009), we are witnessing the advancement of a universal interconnected network of video, audio and text communication done electronically that has the potential to blur the difference between communication done in masses and at personal level and that done in private and in public. He further argues that new media has the potential to change the meaning of geographic distance thus allowing for huge increases in communication volume, providing interactive communication opportunities, providing the possibility of increasing the speed of communication and allow for many forms of communication that were previously separated to interconnect and overlap.

This study focused on mobile technology services as it is one of the forms of new media. The spread of mobile phones across the developing world is an example of most remarkable technology introduced the past decades. This technology has been facilitated by the use of affordable handsets and prepay cards which had enable its accessibility by hundreds of millions of first-time telephone owners to make calls and send text messages in their daily communication. However, new mobile users still live in informal cash economies, without access to financial services that others take for granted (Afrobarometer, 2013). Across the developing world, there are many people with mobile handsets than holding an account in bank (Porteous, 2006).

1.1 Mobile Technology

Mobile technology is the technology used for cellular communication. Mobile code division multiple access (CDMA) is a technology that has evolved speedily over the past years. Mobile phones, particularly smartphones support a wide range of services such as multimedia services, messaging, and access to Internet, email, wireless communications, business applications, photography and gaming. Such phones are referred to as smart phones as they offer more general computing capabilities. The technology allows the mobile population to use company resources and data. Whether your staffs are travelling to meetings, out on sales calls, working from a client-site or from anywhere on the globe, mobile phones can help them keep in touch, be productive, and make use of company resources (Chibba, 2009).

Mobile phone devices can also change the way a company does business - new technologies lead to new ways of working, and new products and services that can be offered to one's customers. They can make one's team more creative, efficient and valuable clients. Mobile technology allows organizations to have an exceptional level of connectivity between vendors, employees and customers. It enables workers to download applications which enable their devices to connect with others through social media such as Facebook, Twitter and LinkedIn. The firm can also use web-based applications to facilitate direct communication with their audiences in many ways (Chibba, 2009).

Mobile communication/telephony is progressing at a speed that is rapidly extending the choice of possibilities that can be realized through mobile technology (Samir, 2012). This is beneficial to all business organizations resulting from enhanced communications offered by the devices ranging from internet access, video conferencing and banking. Mobile telephony has been described by Saren (2011) as the single most transformative technology development of recent times. Mobile phones and telephony, at large, are important ICT tools and phenomena for development due to their characteristic that they can easily overcome the infrastructure barriers in remote and rural areas, not only in Africa but also in other developing countries worldwide. Furthermore, the rapid advancement in technologies and the ease of use, characterized with the falling devices prices, the mobile phone is seen as an adaptable and appropriate tool to bridge the digital divide (Kotelnikov, 2007). The scope of applications for development is wide as it can reach the majority of people; its impact is enormous to business organizations. Wireless communications generally provides the platform that makes it possible to transfer digital data in many developing countries. This

results from lower costs of the systems relative to provision of short message services (SMS), fixed networks and the enabling of wireless Internet connections (European Cable Communication Network, 2009).

Mobile phones have become a central part of human daily life regarding personal communication across the globe. Statistics from the International Telecommunication Union reported in the end of the year 2013 indicated that there were approximately 3.3 billion mobile phone users across the world equivalent to 49% penetration rate during the previous year. Mobile technology has emerged as an essential computing and communications machine available at our fingertips. It has enabled passing of information technology and telecommunications systems based on the fact that it offers a wide range of services beginning with the basic telephony to data services world over (Hanz, 2009).

1.2 Empowerment of women

According to Kretschmer (2012), empowerment of women necessitates transformation of labour division as well as changes in ideologies prevalent on the roles and responsibilities of women and men. Empowerment helps achieve practical as well as strategic gender needs by self-reliance among women and acknowledging power dynamics rooted in gender class, ethnicity and age. Malhotra *et al.* (2002) in their different views argue that “empowerment” has been used to advocate more often for certain types of intervention strategies and policies than to analyze them. This is demonstrated by a number of documents from the United Nations (UNDAW, 2001; UNCEF, 2009; UKDID, 2000), and other organizations.

For women to get empowerment economically, they have no option but to compete in a world male-dominated. The interest of this study was to assess whether cell phone is an empowering tool for women or not. Kretschmer (2012) posits that women empowerment is about the process by which women, who have been denied the ability to make strategic life choices. The ability of women to exercise choice incorporates three inter-related dimensions such as: resources, agency and achievements. He continues to argue that these three dimensions of choice are indivisible in determining how to measure women empowerment. For cell phones to contribute to empowerment they have to fit within the three dimensions.

In the USA, women entrepreneurs have observed great transformation in their businesses after adopting mobile technology (OECD, 2011). The main drivers of this trend are new business opportunities, increased competition and performance and improved business practices, (Komunte, Rwashana, &Nabukenya, 2012). According to Donner, (2008), practical proficiencies including Information and Technology are essential subjects for conducting incorporated operations for marketing. “The core firm is distinct by its end-use market and its knowledge base, as well as the technical competence and not by its office buildings and factories. The focus on the customer, segmentation of the market, market targeting and positioning are assisted by technology” (Wakukuna 2008). Existing ventures and new business opportunities are provided and can be realized via the mobile phone usage including mobile money, internet and emails (Komunte, Rwashana, &Nabukenya, 2012).

A study done in Sweden by Karjaluo (2002) concludes that women don't have as much access to technology, so special effort has to be made to increase women's access to ICT. The

study explored and discussed the role, which ICT has in empowering women entrepreneurs and providing new opportunities to strengthen their businesses. Women owning entrepreneurship businesses get their customers and build their businesses in ways they could not do before through the use of mobile phones, electronic platforms, radio, TV, blogs and the Internet. While persisting challenges exist especially in rural areas, effective use of ICT is helping women entrepreneurs to overcome several barriers. The study found ICT could play an important role in women entrepreneurs' empowerment especially when coupled with policies addressing challenges facing women. ICT is especially well adapted for women entrepreneurs who often mix family duties with entrepreneurial responsibilities and can benefit strongly from the time efficiencies and location flexibilities which ICT make possible. Empowering women entrepreneurs through ICT requires a multi-stakeholder effort.

In Chennai, India, a network of women groups established since 2001 to expand opportunities to market products using cell phones for communication, reported a positive correlation (Joseph, 2005). Through the network, the women have increased their income which has helped in building their confidence in the betterment of their family lives. Consequently the women groups have learned that the cell phone is an empowerment tool (Joseph, 2005).

In a study by Rathgeber and Ofwona (2000) on examining potential and current influence of ICTs in Africa, specifically focusing on gender issues, there is need for information to be made which may be relevant to women needs in the areas of micro-enterprise, education and health.

In African countries alone Kenya included, and according to the Communications Commission of Kenya (CCK, 2012), mobile phone usage has grown at an average of 65 percent a year for the past five years. This is twice the rate of growth in Asian countries (ITU, 2008). In Kenya, the growth rate is even higher. Statistics indicate that Kenya has more than 18 million subscribers, up from 6.5 million in the year 2006 (Nokia, 2010). Penetration of the use of mobile phones in Kenya is mainly driven by affordability and innovation. This trend means that mobile telephone service has become more affordable as service providers roll out relevant applications specifically meant for businessmen and women, supported by new technologies and cutting down on operation costs.

A key service that mobile telephony has played is in advertising. Most business organizations, around the world have engaged in advertisement through mobile phone due to higher penetration of these services both in urban and rural areas. Dcadvert (2009) argues that mobile telephony has been the ultimate platform for various companies to market and advertise their products. This implies that mobile advertising is an effective and more result-driven form of marketing, given that users can be away from their computers but still be able to do business since they have mobiles phones in their hands most of the time. In Kenya and Africa at large, mobile marketing is blooming at a much faster rate as compared to the other forms of marketing.

As noted by Czurak (2007), business is all about networking and communication, making the technological innovations of the last few decades highly influential in the business world. It is of utmost importance that a business can easily contact its customers, clients, and

colleagues - no matter where people happen to be or what they happen to be doing (Dcadvert, 2009). For entrepreneurs both large scale and small scale, mobile telephony and communication is key asset as they allow those in business to stay in touch with their staff and customers, including other services that are found in smart phones, for instance, instant access to mails and other data (Herrington, 2009).

Entrepreneurship is perceived as the engine of growth in Kenya because of its key role in economic development. The sector provides a lot of opportunities for employment as well as market for goods and services thus steering competition and innovation (KIPPRA, 2002). Entrepreneurship comprises about 75 % of all businesses, employ 4.6 million people (30%), accounts for 87% of new jobs created and contributes 18.4 % of the GDP (GOK, 2013). The Kenyan government considers the sector as the center of industrial development and has held different development strategies (GOK, 2010). However the sector faces binding challenges that make it impractical for it to realize its full potential and deliver to the government expectations. The challenges included limited access to market, information, finances and technology and the drawback of policies which do not business environment among others (GOK, 2005).

Limited access to opportunities remains a severe constraint to the growth of entrepreneurs in Kenya resulting from the diminishing domestic market as an effect of globalization (GOK, 2005; KIPPRA, 2006). Limited access to information makes entrepreneurs become unknowledgeable of available market opportunities. The total aggregate demand for products is low and markets are oversupplied by overproduction and dumping of imports. This has

resulted into dysfunctional markets due to insufficient supply of information, escalated transaction costs and inflexible competition for similar products. High costs of transactions are due to information asymmetry and market inefficiencies. Many entrepreneurs still face different challenges in accessing markets propagated by limited information about market, and poor market research leading to a discrepancy between the demand and supply (KIPPRA, 2006).

On the other hand, Information Technology (IT) is identified as an enabler of other sectors, presenting enormous opportunities for entrepreneurs to improve market access (GOK, 2007). Mobile telephony has become a part of everyday life for millions of people and business organizations across worldwide. People in the business world nowadays consider the ability to communicate by mobile phones as necessary and ordinary (Donner & Escobari, 2009). The significance of mobile telecommunications services beyond basic person-to-person voice communication cannot be overemphasized. Mobile phones have become absolutely crucial for anyone doing business today due to the fact that they provide flexibility and efficiency in communication that has never existed before, and has quickly become expected in the fast moving world of modern business (Joseph, 2005).

Mobile phone services have become an indispensable tool in the highly globalized, knowledge economy. Today entrepreneurs can carry out business through their mobile phone thanks to WhatsApp, face books, M-Pesa, Airtel money and others such as OLX. This is because one only needs to take a photo of the product he/she is selling post it through WhatsApp, negotiate through the use of WhatsApp, facebook or SMS, and upon agreement

receive payment through M-Pesa or Airtel money. This saves the seller and the buyer operation costs which leads to improved profits and thus raising the living standards of Kenyans. This has led to their finding a place in the government of the day which is encouraging youth and women to engage in business in order to earn a living.

1.2 Problem Statement

Increased accessibility to mobile phones has introduced changes in most sectors of the economy and particularly the urban informal sector with SMEs changing their business and operation environment, thereby creating an impact on Kenya's fastest growing sector and employer (Government of Kenya, 2012). Women entrepreneurs around the world are making a difference. They contribute numerous ideas and a great deal of energy and capital resources to their communities, and generate jobs as well as create additional work for suppliers and other spin-off business linkages (Commonwealth secretariat, 2002). Promoting women's economic and political empowerment has gained greater attention over the last decade (Athanne.2011).

In spite of the efforts by various organisations and governments to enhance women's entrepreneurship, and despite the potential of enterprises run by women to boost local economy (USAID, 2001) briefs indicate that women owned enterprises grow less rapidly and are likely to close sooner than male counterparts. The choice of business by women that conforms to their traditional roles also defines profitability of the enterprise. Women owned enterprises generated less revenue compared to revenues generated by enterprises owned by men, which earned 74% more (Central Bureau of Statistics, 2011)

Reynolds (2004) posits that women entrepreneurs are unlikely to adopt more sophisticated technologies if they are not familiar with the basic ones as opposed to men. That is why entrepreneurship entities owned by men grew faster at a rate of 32% annually as compared to 16% of those owned by women. One reason may be because of the limited number of women who have technical knowledge.

Many businesses owned by women are therefore, still missing the huge potential benefits of using mobile phone technology comprehensively as a part of their business enhancement (Ikiara, 2001). The different modes of communication embedded in most mobile phones including voice, SMS, radio, TV, interpersonal and group communications do not appear to have improved the situation (AFFRI, 2009). Although literature indicates that women entrepreneurs have acquired mobile phone technology, there are very few studies that have examined whether and how women are using the technology to enhance their businesses. In addition, inadequate literature exists on the role of communication and information flow in the adoption and use of mobile phone technology. Therefore, this study sought to examine the adoption and use of mobile technology by women entrepreneurs in Machakos County.

1.3 Objectives of the study

1.3.1 General Objective

The general objective of this study was to examine the adoption and use of mobile technology by women entrepreneurs in Machakos County.

1.3.2 Specific Objectives

1. To assess the extent of adoption and usage of mobile phone services in empowering women entrepreneurs in Machakos County.
2. To find out factors that influence the adoption and use of mobile technology services by women entrepreneurs in Machakos County.
3. To investigate the role of communication and information flow in the adoption and use of mobile technology by women entrepreneurs in Machakos County.

1.5 Research Questions

1. What is the extent of adoption and usage of mobile phone applications in empowering women entrepreneurs in Machakos County?
2. What are the factors that influence the adoption and use of mobile technology services by women entrepreneurs in Machakos County?
3. What is the role of communication and information flow in adopting and using of mobile technology in Machakos County?

1.6 Significance of the Study

The findings of this study addressed perceptions, beliefs, and opinions and lived experiences of the use of mobile telephony by business organizations as a business tool in achieving their

goals. The information would be useful to ICT policy makers, regulators and development partners, in helping to understand challenges faced by business organizations thereby helping to define an entry point for support.

The findings of the study also provided a perspective for cellular operators on market segmentation and target to serve these business organizations better. The study added to the body of knowledge on mobile telephony use in business organization and provided a framework for researchers in commerce, public relations and telecommunications to carry out further research. Through the process of interviews and validation of the findings, as well as dissemination of the final report, the findings would sensitize other business organizations to view the mobile phone as a tool for information sourcing, growth and expansion of business organization.

The findings of this study are expected to provide insights to the empowerment of women by targeting women entrepreneurs and their use of the mobile phone as a business tool. By assessing the positive impact and the challenges the mobile phone use has had on women owned enterprises, the study formulated a mobile-phone-and-empowerment conceptual framework and developed a new model that could be used to explain the different ways a mobile phone can be used for empowerment of women.

This study outlined the importance of communication and information flow in the adoption of any new innovation. The study revealed the importance of intertwining technology and information flow in every stage of the adoption process so that it may be accepted and used by the masses and especially entrepreneurs.

1.7 Scope and limitations of the study

This study examined mobile phone services adoption and use by women entrepreneurs in Machakos County. The categories of the enterprises considered in the survey were from all sectors of the economy, these include; agriculture, energy, health services, hospitality, real estates, information communication technology services, logistical services, manufacturing, retail and distribution. The study scope was limited to women entrepreneurs only and therefore it cannot be generalized to all entrepreneurial establishments since men and youth entrepreneurs could be having different views on adoption of mobile technology in entrepreneurship.

There was literature review limitation because there were very few empirical studies done in the area of women entrepreneurs and mobile technology and especially in Kenya. So the study borrowed heavily from other countries, some of which were at different development levels, so as to add scholarly thoughts to the limited local studies.

The type of information that the study sought to investigate was also limited. In this regard, the mixed method research methodology was used to study adoption and use of mobile technology by women entrepreneurs. The broader ICT area which is key to entrepreneurship development was not focused on. Mobile technology is termed as the easiest technology which can be embraced even by those with basic education skills. So to be able to understand the adoption of the broader ICT, the researcher concentrated on mobile technology services only.

1.8 Operational Definition of Terms

- Adoption:** Refers to the ability to acquire and use a new technology. In this study, this word is used to mean acquiring and using mobile phone technology services by women Entrepreneurs to run their entrepreneurs.
- Use:** A consistent process which enables hesitant women entrepreneurs to successfully add and utilize mobile phone technology services in their businesses.
- Access:** Refers to the difficulty of usage among women entrepreneurs that potentially could use a mobile phone as they are within the range of a mobile network may be due to high cost or cultural barriers.
- Entrepreneurs:** Capacity and willingness of women to develop, organize and manage a business venture along with any of its risks in order to make a profit.
- Accessibility:** Turning ICT inputs (mobile phone information services such as Mpesa, short message service, banking) and many other inputs into a set of tangible deliverables.
- Information need:** Refers to the realization that the know-how one has is insufficient to satisfy what one wants to meet.
- Mobile phone:** A portable communication device connected to a service provider.
- Economic Empowerment:** Empowering women to participate fully in economic life across all sectors through increased sales and profits, business growth, increased business skills and increased family welfare leading to empowerment.

Communication and information flow: A set of sequential steps in transferring mobile phone technology service message from innovators to the women entrepreneurs.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter focuses on scholarly works that address the adoption and use of ICT tools and especially mobile phone technology in business enterprises and how they influence them. It begins with a look at mobile accessibility in the world, gender and mobile phone accessibility, women and entrepreneurship, the context of empowering, and communication and information flow. This is then followed by a review of the literature based on the objectives.

2.1 Mobile Accessibility in the world

Recent developments in mobile communication and computation technologies have led to the expansion of mobile phone, smartphone, tablet, computer, and netbook ownership (Hamerman,2010). Typically marketed to the developed world as a supplementary to standard laptops and desktop computers, these electronic products often offer lower price points to the consumer. This lower price points cater well to developing countries and their rapidly evolving markets for ICT expansion and adoption (Chew, 2013). These mobile devices come equipped with basic mobile communications, hard and software such as Wi-Fi and 3G services which allow users to connect to the Internet via mobile and wireless networks. This evident change towards mobile technologies acceptance and implementation make modern digital telecommunications and the internet more accessible particularly to those in developing counties and emerging markets.

Mobile information and communication technology has stood in to act as a bridge within the digital divide (International Telecommunication Union, 2008). Data collected by The International Telecommunication Union (ITU) revealed the course of mobile technologies as their adoption outdoes and even replaces the use of desktop computers and laptops.

The ITU estimates that as of 2013, approximately 6.8 billion mobile-cellular subscriptions were held worldwide, 5.2 billion of which were held in developing countries (Samir, 2012). These numbers stand in stark contrast to the fixed-telephone penetration rate as measured by the number of subscriptions which stand at approximately 1.2 billion worldwide, a small margin over half of which belong to the developing world (Saren, 2011).

Table 1 displays telephone subscription for developed and developing countries as well as world totals from 2010 to 2013.

Table 1: Telephone subscription in the World

Year	2010 '000,000'	2011 '000,000'	2012 '000,000'	2013 '000,000'
Fixed telephone subscription				
Developed	552	542	531	520
Developing	676	662	685	652
World	1228	1204	1186	1171
Mobile Cellular Subscription				
Developed	1418	1475	1538	1600
Developing	3901	4487	4872	5235
World	5320	5962	6411	6835

Source: ITU (2014)

The trends displayed in the table above are in line with sales reports by technology companies selling mobile related technologies in developing countries and emerging

markets. Acer and Lenovo are some of the multinational manufacturers of computers who market notebooks at affordable prices in the emerging markets such as those in China, Indonesia and India (OECD, 2010).

2.2 Mobile phone penetration in Kenya

According to the Communication Commission of Kenya (CCK) 3rd quarterly 2011/2012 statistics report as of October 2012 Kenya had four licensed mobile phone providers with a total of 29.2 million subscribers between them. Kenya had a mobile penetration rate of 75.4%, a figure significant higher than the African average of 65% (Porteous, 2012). By the end of 2012, 93% of Kenyans were mobile phone users and 73% were mobile money customers (Mutwiri, 2012). Additionally, at least once a day, 81 percent of Kenyan adult made or received a call, 61 percent sent or received messages in form of texts, and 22 percent send or received money or paid a bill using a mobile phone (Demombynes and Thegeya, 2012).

Demombynes and Thegeya (2012) using Kenya Afrobarometer surveys (2012) showed that 87% of Kenyan adults own their own individual phones, an additional 10 percent used a phone owned by someone else in their households, and 3 percent use a phone owned by someone outside their household (Demombynes and Thegeya, 2011 and Mutwiri, 2012). On average Kenyan households own 2.4 mobile phones, and 93 percent own at least one phone (Demombynes and Thegeya, 2011). It is within this background that the study sets out to investigate the adoption and use of the mobile phone services by women entrepreneurs to empower them.

2.2.1: Uses of mobile phones services in entrepreneurship

Mobile phone can be used by women entrepreneurs for voice communication and short message service. It can also be used for money transfer services, storing business transactions information, sending or receiving business information through short message service. Customers can pay goods using the Mpesa or Mshwari through a paybill account, which is a registered account by the entrepreneur (Liu & Mithika, 2009).

Bunivinic et al. (2013) established that the mobile phone can be used for remote computing with the calculator application that can be used to compute the cost of goods and services to get the profit after sell. Mulwa (2012) confirmed that mobile phones through the use of internet can be used to open up new markets and also do the sales of various products for women entrepreneurs.

Online social networks like Whatsapp, Facebook, Twitter, Youtube and Myspace have generated a lot of interest among many scholars (Wasserman, 2011). The networks seem to have been adopted by a broad range of society in many countries (Kamau, 2013). The proliferation of new media including the internet and social media, have multiplied information and discussion and therefore provide potential for a wide market for entrepreneurs.

2.3 Gender gap and mobile phone accessibility

A groundbreaking report by Foundation and Vital Wave (2011) revealed for the first time the extent of the gender in mobile use among middle and low income countries. The research,

the first detailed global study of its kind, showed that a female in a low or middle-income country is 21% less likely to own a mobile phone than a male (Macoy and Smith, 2007).

According to the Third UN Millennium Development Goal on gender equality, closing the gender gap would empower more women, enabling them to be connected with family and friends, while helping them obtain paid-for work or run their enterprises. High mobile phone usage by women stimulates socio-economic growth and at the same time generates increased subscription and revenue growth.

Mobile phone ownership provides distinct benefits to women, including improved access to education, health, business and employment opportunities. A survey done among women in middle and low income countries revealed that mobile phone helps women to live a more secure, connected and productive life (Chew, 2013).

The United Nations women's Global (2003) shows that from India to Senegal to Kosovo, women are using the power of mobile phones to unlock economic opportunities, women business owners particularly view mobile phones as essential tools of production, with more than half mentioning that they have used their mobile phone to earn additional income. 85% of women reported feeling more independent because of their mobile phone. From connecting communities and transforming communications, to enhancing well-being and opening up trade, the mobile phone is revolutionizing business practices in the world, especially for those in rural areas. But its potential around the world is yet untapped (Macoy and Smith, 2007) This comprehensive report is a crucial first step for budding business

women in developing countries; it proves how important it is to bring women into the conversation and close the gender gap in accessing mobile phone technology.

Hayden (2005) carried out a study on the mobile phone gender gap in low and middle-income countries found that closing the mobile gender gap by adding 300 million subscription among women in these countries would bring significant social benefits to women and their families, as well as US\$13 billion immediate incremental revenue (ARPU or average revenue per user) to operators of mobile phones. The revenue increase opportunity ranges from US\$740 million in Latin America to US\$4 billion in East Asia.

Technologies using mobile phone have the potential to improve the economic performance of SMEs affecting almost every structural characteristic of these organizations. With the adoption of this new technological dynamo, its usage is expected to gain prominence by virtually all SMEs in Kenya.

2.4 Women and Entrepreneurship

Women entrepreneurs around the world are making a difference (Lynn, 2013). They contribute numerous ideas and a great deal of capital and energy thus generating jobs as well as create additional work for suppliers and other spin-off business linkages (Commonwealth secretariat, 2002). Svanaeset *al*, (2010), adds that it is undeniable that women running businesses constitute the major actors thus contributing to economic development thus becoming visible in developing counties.

The Kenyan government recognizes that women entrepreneurs have not been on at the same level with men when it comes to their access to opportunities and assets but it has yet to address the challenges facing women in business effectively (Bhagat, 2007). However, promoting women's economic and political empowerment has gained greater prominence over the last three decades (Wakununa, 2008). For example, several strategies are being used by a number of partners facilitating full role play in the sector. Both the Government and the private sector (including NGOs) are engaged in various efforts to empower entrepreneurs and in particular women, to grow their enterprises such as the formation of Women Enterprise Fund (WEF) in Kenya. Women Enterprise Fund (WEF) was conceived and launched officially in the year 2007 (GoK, 2007). The core function of the fund is economic women empowerment. Loans from Women Enterprise Fund beneficiaries targeted through the financial intermediaries who are their partners. This fund is aimed at contributing to the government realize the 3rd Millennium Development Goal (MDG) on gender equality and women empowerment. In recognizing the critical role of women in socio-economic development, the WEF identified as project as a flagship under the Vision 2030 social pillar. As such, the fund is expected to act as a catalytic in mainstreaming women in the formal financial services sector with the aim of achieving financial sustainability.

Kenya has also made some good progress in attaining democracy besides a number of challenges facing the country. In an initiative to support the youth and women in making them financially independent, the Jubilee Government launched Uwezo Fund that is yet to sufficiently take off despite the publicity surrounding the fund. Being one of the promises under the Jubilee manifesto during the 2013 campaigns, the government has been put to task

to fulfill its mandate by disbursing the Kshs 6 billion Uwezo fund to the youth and women (GoK, 2007). The aim of the Uwezo fund is to provide access to grants by youth and women loans which are interest-free besides mentorship opportunities aimed at enabling them take advantage of up to 30% of procurement done by the Government for women,youth and persons with disabilities through its Capacity Building Programme (GoK, 2007). Each eligible group can be awarded from Kshs 50,000 and not exceeding Kshs 500,000 at a time depending on the strength of their project proposal and up to Ksh3 million per project depending on how qualified their project proposal will be.

The government has also intervened through the use of its own financial institutions such as Kenya Commercial Bank (KCB) to channel funds to women owned projects. KCB applied for a loan guarantee to reduce collateral requirements for selected SMEs and to focus on building its understanding of individual SME businesses, their cash flow, and savings (USAID, 2006; M. Rostal, 2009). To date, the KCB \$3.95-million loan has guaranteed 216 SME loans totaling \$3 million. KCB has developed and introduced two new loan products in the Kenyan market characterized by guarantee, these are: Biashara Working Loans, which target SMEs, and Grace Loans, targeted to women-owned businesses. The aim of the government is to ensure that women owned projects such as SMEs have financial sustainability.

The affirmative action in the Kenyan constitution (GoK, 2010) seeks to empower those that are disadvantaged by historical factors, women included. It is a deliberate policy that seeks to remedy past discrimination by increasing chances of the people affected to be introduced to

what they had always denied previously. The constitution of Kenya (2010) recognizes women and the ethnic minorities as special groups deserving constitutional rights including right to own and run business enterprises (Kenyan Constitution, 2010).

2.5 Context of Empowering

The context of empowering and whether the cell phone is an empowering tool is an issue of interest in this study. According to Kabeer (1999), women empowerment is about the process whereby those who have been denied the ability to make strategic choices in life ends up acquiring such ability. The ability to exercise such choices entails three dimensions including; resources, agency and achievements. Kabeer (1999) argued that the three dimensions of choice are further divisible in defining an indicator and thus validating it as a measure of empowerment.

Kabeer cautions that an analyst from the outside may use different aspects of value judgments to measure and define empowerment which may not be relevant to the women in question. He thus advises that factors such as political, socio- economic and cultural should be examined as they influence what empowerment entails and its definition.

Malhotra et al (2002) views empowerment differently as they argue that it has been more often used to advocate for certain interventions, policies, and strategies, as evidenced by different documents from the United Nations (United Nations Division of the Advancement of Women (UNDAW) 2001; United Nations Children's Fund (1999); UK Department for International Development (2002) and other organizations. The authors also noted that

feminist activities writings often promote empowerment of individuals and organizations of women, but vary in the extent to which they conceptualize or discuss how to identify it; reinforcing the feeling that empowerment is a notorious contentious concept.

In the World Bank's Source book on reduction of poverty and empowerment, Narayan (2002) acknowledged that women's empowerment encompasses unique elements. First, women are not just a group among several disempowered subjects of society. Second, the household and interfamilial relations are major determinants of women empowerment in a way that it is not true for all other disadvantaged groups. This means that effects at empowering women must be especially cognizant of the implications of broader policy action at the household level. Third, empowerment among women needs a systematic transformation among those supporting the existence of patriarchal structures.

2.6 Communication and Information Flow

Communication is a need that is shared by people all over the world. People communicate to share and receive information on many issues and activities affecting their daily lives (Myhr and Nordstrom, 2006). Communication comes from the Latin term 'communicare' which means to share. In the context of this study communication will be defined as sharing of information between people. Information (from the Latin word *infomare*, meaning 'to describe') is a description of events or activities. The term information is habitually used to signify knowledge as a process of being informed as well as in referring to data, facts and different types of information (Apostle and Raymond, 1997).

Shannon and Weaver (1949) define information as a measure of one's freedom of choice when one selects a message. In Shannon and Weaver's information theory, information and uncertainty are closely related and lack of information may refer to the extent of uncertainty revolving around a situation. This echoes Lester and Koehler (2007) who define information in broad terms to refer to anything that influences the state of knowledge of the receiver as described by Kaniki's (1989) definition of information as ideas, facts, imaginative works of the mind and data of value potentially useful in decision-making, question answering or problem-solving. Stoecker (2005) argues that the most important standard for information is that it is useful when acted upon, and it produces the predicted effect.

Bhagat (2007) hypothesized that information is a key component of socio-economic development whose application has not been demonstrated. They have also argued that information can be a powerful catalyst to transform society, but have been unable to show tangible linkages between information investments and the achievements of specific development goals (Menou 1993). The limited status given to information in most third world countries suggests that its potential value is not self-evident and equal. Information usefulness is dynamic and differs according to one's experiences, one's environment or within one's livelihood. Hester (2005) argues that sometimes people are not always aware of what development information entails, and opines that there is a general lack of awareness among SMEs owners. Thus, the extent to which users of information in communities which are developing are able to handle information also determine the usefulness of such information as a resource for development. For example, the fact that mobile phone has many

different features, most women in business use the basic level features to send and receive information (Muturi, 2012).

Case (2007) notes that information need is recognition that existing knowledge is inadequate to satisfy the goals and needs of the people. That is, the information sources available do not provide relevant information that can be utilized to perform daily activities effectively. Hayden (1999) agrees and points out that the user perceives a need in the context of their environment. According to Hayden (1999) satisfaction occurs when the information has been analyzed and found to satisfy the original need. Non-satisfaction occurs when the information does not satisfy the original need. The only way to determine what information source is appropriate to satisfy information needs in a given community is to find out, first, about the community itself and, second, about the information the community is trying to get or use (Stoecker, 2005).

2.7 Empirical Review

There are many factors that slows down the adoption and use of mobile technology , in Kenya these factors may include; lack of awareness, information, high cost of handsets, lack of accessibility, gender, poor supporting infrastructure, lack of mobile phone literacy, low level of mobile use and social inequity.

2.7.1 Extent of adoption and Usage of Mobile Phone Applications in Empowering

Women Entrepreneurs

The use of mobile phones has spurred a great economic development in African countries.

Some of the specific features of mobile phone technology is the mobile phone-based products and services offering beyond basic messaging in form of texts and voice calls. Despite the fact that mobile phone services have more often focused on applications for entertainment, in developed countries, the same applications have been used to provide opportunities for disseminating information on agricultural prices, health care monitoring and money transferring in developing countries.

The rapid adoption of M-Pesa and other m-money transfer services is not taking the population by surprise as it has impacted on the financial development not only in Kenya but also in other countries in the sub-Saharan Africa. It is estimated that less than 30 percent of East and Southern African population have a formal bank account, where 9 percent are in Tanzania to 63 percent in South Africa (FinMark Trust, 2008). Kenya had only 450 bank branches and 600 automatic teller machines in 2006 (Vaughan, 2007). Kenyans primarily sent money via Western Union or post office, intermediaries (such as bus drivers), or through friends or relatives apart from the formal financial systems. The use of Western Union was perceived to be more secure but was more often very expensive and not available in remote rural areas. On the other hand, sending money through transport services or via relatives and friends is more accessible but entails high risk of theft. Evidence shows that the cost of sending Kshs1,000 (US\$15) from Nairobi to the western region through M-Pesa by 2008 was two-fifths the cost of the post official rate and one-fiftieth the cost of sending it through buses (Morawczynski, 2009). As such, the use of mobile phone technology by women entrepreneurs has been influenced by many factors which also appear to affect their empowerment in business. According to Cracknell (2004), the different type of enterprise

that women choose to run is normally gendered.

Skills base is a major determinant of business choice among women. Gakure (2004) noted that when women require to earn more money they normally turn to their domestic skills to explore the micro-enterprises. The business choice started was largely gendered in the first place. This is in recognition of the biasness in education and training which influences the career choices as defined by cultural setting. Business choice thus defines the information required which in turn define the ICT tools used (Kalundo 2004).

Mobile phone usage is very high among the SMEs operating in the Kenyan economy. This is evidenced by the findings of a study by Maru (2004) carried out among 50 entrepreneurs (72% women) in Eldoret where it was found that there was a very high penetration of mobile phone usage. Among ICTs usage, 88% of what was commonly used were mobile phones. The respondents mentioned that they were able to communicate and deliver products through the use of ICT faster than they would if it was not there. Specific advantage realized through the use of mobile phones included: faster and easier decision making, faster transfer of information, reduced transaction and communication costs, quicker sales, and easy access to products and services. Maru (2004) posits that the most important information required regarded suppliers and the market. Mureithi (2005) further reported that there was high usage of mobile phone by MSEs owners in Kariobangi Light Industries in Nairobi known with 450 plots, at 93.8% against usage of the fixed line of 29.7%. Among the users without a landline, 22.0% mentioned that they did not need one.

Women support groups also have influence on the tools they use in accessing information. Evidence shows that they use close informal support groups for their businesses, their spouses, relatives and their own groups. According to Hisrich and Peters (2002), women were found to consult their spouse on major decisions in their enterprises. On the other hand, it was revealed that men consulted their spouses last. Through informal consultation, information was found to follow the pattern whereby mobile phones was defined as one of the most effective communication tools. Business needs and the use of the information were more often informed by the motivation for first establishing the business.

In a study done by Imbaya (2004) in Eldoret seeking to determine the extent of entrepreneurial disposition and how it affect women performance. The study also entailed searching for the social factors affecting the development and growth of women enterprises. A total of 175 women enterprises were studied where the findings revealed that most of them perform poorly as justified by the fact that they lacked locus of control. The decision to go into business was determined by people other than themselves as indicated by (68.6%), followed by husband (24.6%), parents (27.4%) and friends (13.1%). The decision to start a business followed a clear description of their situation by only 31.4% of the women. Owning a business enterprise was therefore described as a necessity rather than an opportunity. To achieve growth, women therefore need to redefine their situation in order to see owning an enterprise as a means to their prosperity.

A study by Kibas and K'Aol (2004) of 24 SMEs which were considered to be successful with over 5 years' operation in Kenya revealed that 64% of business people (comprising 29.2%

women) entered business due to the opportunity they saw. As such, the decision to start a business was deemed critical for success.

According Huyer *et al.* (2005), women were losing as far as the expansion of business networks by relying mobile phones rather through the Internet. By relying information on the phone, they limited their contacts to informal family networks thus limiting their potential for entrepreneurship growth. Huyer *et al.* (2005) found that men frequently felt that women freedom to have mobile phones destabilized their marital relationships. This was evidenced by the fact that in many cases men monitored mobile phone and Internet usage by their spouses. While mobile phone demonstrated a gain in Chennai, over reliance on it was deemed in Southern Africa as it caused distress in women's relationships with men (Huyer *et al.* 2005).

Porter and Millar (1985) defined value chain analysis as a tool in an enterprise and that it helps in understanding the dynamics of women owned enterprises. Women enterprises were less profitable compared to those owned by men. The fact that the inputs are similar, mobile phone technology helps in understanding how women use information at every stage in value chain. The model does not address the concerns of women who do not consider to enter into business. Porter and Millar identified primary activities as those directly related to the production of goods and services and secondary activities that support the production process.

Mutwiri (2013) investigated mobile phone and rural livelihoods among smallholder farmers in Machakos County, Kenya. The findings of the study revealed that the use of mobile phone technology improved the livelihood of farmers by increasing their income while reducing losses, though it did not directly affect the livelihood smallholder farmers but helped them to get permanent jobs or off-farm part-time jobs. It was concluded that mobile phones are valued due to the fact they keep farmers connected to their friends and relatives but not necessarily used to access and share agricultural and rural livelihood information. He further found that the mobile phones had the potential to improve the livelihoods among smallholder farmers but was not optimized due to lack of training and awareness.

2.7.2 Factors that influence the adoption and use of mobile technology services by women entrepreneurs

The environmental factors influencing adoption of ICT includes the physical conditions such as time, noise, space and temperature. According to Sida Review Report (2010) East Africa is characterized generally by weak infrastructure, such as bad road conditions, poor transport network, limited electricity, limited health facilities, financial institutions and weak public offices. The picture already paints East Africa as a place where basic necessities do not reach the majority of the population because of the inadequate facilities available. The organizational factors have also been found to influence mobile phone service adoption and use include social network, management and organizational pressures, and word processes.

Technical factors have also been found to influence adoption and use, for example, system configuration, system stability and network connectivity. The mobile penetration in Kenya is 89.1%, yet coverage is 34.14% meaning that there are many areas where access to signals is

not available (CCK Sector report, 2012). According to Nairobi GSM Networks Report (2009), Safaricom provides bulk of this coverage as it has the best network coverage however the report further indicates that Safaricom has poor network quality compared to Airtel and Orange which are the other Mobile Network Operators (MNOs) in Kenya. This means that access to services may not be effective.

Social factors also have influence on the adoption and usage of mobile phone services and these include culture, family conflicts, career aspirations, economy and ethical standards. The society engaged in mobile phone usage accesses services described by various scholars as the Information Knowledge Society, Network Society and Post Modernists (Manuel Castells 1996, Van Dijk 2009, Stalder 2006). What is unique in these characteristics is the fact that the society is liberated through high affinity for independence and freedoms and are eager to take charge of activities in their lives at convenience. Kenyans have also been described as supportive of relatives in the rural areas and 79% of Kenyans live in the rural areas (IFAD, 2011).

The findings by Ndi (2013) showed that mobile phone telephone technology define some variance in the banking industry in Kenya. However, the variance has been explained not to be higher than the unexplained percentage since there are other variables which explain much variance in financial deepening in the banking industry. As such, the results indicated that none of the variables is significantly related to the dependent variable.

Mobile phone usage can therefore only be deduced from the findings of studies on ICTs in developing countries. These studies acknowledge the positive influence of the use of mobile phones on enhancing women livelihood as well as cautioning. Wakunuma (2006) did a study on mobile phones and women in Zambia. The findings of the study revealed that the use of mobile phone can reinforce the existing gender relationships and also strengthen male-dominated societies and power structures. An example of such a situation would be evidenced by some husbands feeling the need to determine the usage of mobile phone among their wives. In as much as benefits of using mobile phones seem to be more than its disadvantages, mobile phones may not necessarily empower women in some cases but rather continue to subject them into already gendered categories of action and thought. This supports the notion that technological innovation only cannot guarantee women empowerment neither can it address the substantial challenges facing women's political, social, and economic development (Wakunuma, 2006).

Harnessing of ICT thus holds great potential for information access among women at individual level thus bettering their self-esteem, exposing them to more career opportunities, increasing their confidence and as well as improving their lobbying, advocacy and networking. ICTs also have potential for self-development among women.

According to Natasha (2003), ICTs have the potential to give a major boost to women's political, social, and economic empowerment thus promoting gender equality. This however can be realized by properly understanding the gender dimensions of the information society. This has been given credence by Sylla (2000) on 'WAP' systems in 100 Senegalese

agriculture networks. Rural farmers were provided with mobile phones with coded access to the Internet to get information market prices on a daily basis. Women in rural areas who were involved in the project specialized mainly in processing traditional food crops. The mobile phones allowed made it possible for them to get in touch with the rural business networks to get information on crop provision. They used the information collected from website to choose the most interesting markets to buy the products they required. They also used mobile phones for other personal purposes. Farmers in the rural areas found mobile phones to be very appropriate as it could be easily carried around and as such preferred to computers. Marcelle (2002) in his study concluded that when ICT is used effectively, it can be a powerful tool for empowering women. This was justified by the fact that mobile phones have the potential to create better opportunities among women to exchange information and gain access to online education thus facilitating their e-commerce activities. Huyeret *al.* (2003) identified two approaches through which ICTs can be used to empower women, one was based on individual empowerment and the other was based on group empowerment. Although these approaches can be perceived to be different, they are not mutually exclusive but rather are complementary.

The findings of a study by Mulwa (2012) revealed that the poor and marginalized population had been excluded from formal banking services for a long period of time. The exclusion was occasioned by factors revolving around logistics and economic viability. As such, wireless communication and mobile banking technology promises to break these barriers as it provides access and at the same time aggregating financial transactions by individuals to constitute viability. Due to the persistence of this exclusion, the use of the mobile phones in

performing monetary transactions has not yet occurred. Consequently, despite the breakthrough brought by mobile phone technology, products using the platform have not experienced success in uptake and use.

Gathuki (2011) pointed that although the Government has put in place various measures to create awareness among women to participate in their large numbers. The general situation is that there are various forces influencing participation of women. The key findings revealed that most women had low level of educational in development projects. Women participation in development activities is therefore perceived to be greatly influenced by socio-cultural issues. The government should therefore strengthen the relevant policies and legislate projects with the sole objective of creating a level playing ground as women in these projects should be encouraged to work in teams and form lobby groups to highlight their needs and advocate for more representation in development projects.

2.7.3 Versatility and accessibility for service delivery

Like the fast growth of the Internet over the past years and the subsequent rise in new ways of doing business, GSM mobile telephone services has fuelled the application of mobile phone in many business organizations. The increased mobility and accessibility of the mobile phones have the potential to have a greater impact than broadband Internet especially in low-income areas where there are scarce communication platforms. This of course, has been coupled with access to the network through relatively inexpensive phones (Marcelle, 2002).

Commenting on accessibility, Srivastava (2005) argues that important calls will not go unanswered simply because the owner of the business or its employee cannot be reached. This means that business owners and management staff can access employees with messages regardless of whether or not they are currently in the office. By use of mobile phones, businesses are at an advantage due to the fact that employees of a company can be contacted regardless of location or situation. This is vital when communication of information that has a vast impact on the business needs to be relayed as soon as possible.

2.7.4 Need for more productivity from employees

Mobile telephony has been identified to be at the forefront on employees' productivity. Studies have shown that mobile applications help process waiting tasks while out of the office and they also help employees make informed decisions by obtaining additional information in situations where clarification is needed (Srivastava, 2005).

The need for constant notification has also necessitated the use of mobile telephony in most business organizations. This is because notification has been valued as a way of keeping employees informed about waiting requests among other important tasks and also for tracking purposes. In addition to the immediate impact of the mobile application on the productivity of the employees using it, the employees are aware of organizational interdependencies and the resulting indirect impacts on the productivity of the people working in the same department (Khalifa and Cheng, 2002).

Proper maintenance of organization structure is an important factor in promoting productivity in business. This is due to the realization the management of business organizations have resorted to the use of mobile phones to carry their business transactions and communication. Mobile phones also provide programs that allow users to organize and schedule their day in order to maintain productivity and meet goals and deadlines (Sarker and Wells, 2003).

2.7.5 Need for Minimization of Costs

Innovation from mobile phones companies whereby we have had variety of services, which include banking, has also necessitated business organizations to venture into mobile telephony. In industrialized countries costly infrastructure established to access banking services such as automatic tellers and credit cards have muted the call for alternative methods of cash transfer and banking systems, however, in developing countries and specially in Sub-Saharan Africa, the mobile cellular infrastructure is already in place, expanding rapidly and providing services such as mobile cash transfer (Lyman et al, 2008). Mobile banking is a simple technology which is proving to be a leap-frog model for growth in the financial services sector in African and Asian countries, and has many positive repercussions for development in addition to providing a means of mobile cash transfer for its clients (Meza, 2009).

2.7.6 Barriers Encountered Through Adopting Mobile Phone Technology In

Empowering Women Entrepreneurs

In as much as many business organizations have engaged the service, of mobile telephony, various challenges have been identified that have had negative impacts on these business

organizations. Review of literature shows that access to mobile phones and Information Communication Technologies (ICTs) resulted from the influence of different factors. The first in the list is low access to ICT tools. According to Marcelle (2002) many women across the world still are not able to fully benefit from such tools due to poor connectivity, inadequate access, illiteracy, and language and behavioral barriers, among others. An UNDAW Expert Group Meeting (2002) provided a deeper understanding of these obstacles to explore ways through which the fast ICT diffusion is associated with growth of the sector risked women empowerment and at the same time offered employment opportunities.

According to Jorge (2002), the benefits are affected by the existence of communication networks and access to information on women needs. Network among women has a potential for the effective information transfer among themselves and their husbands. Natasha (2003) found that constructs of gender in terms of social and cultural aspects, poverty, illiteracy, language barriers and lack of access are among the factors inhibiting access to ICTs among women in developing countries.

One of the biggest fear in many organizations running business is the over use of mobile phone and the costs associated their use. This portrays a potential danger especially when employees are using business mobiles based on the risk that some employees may misuse the phone resulting into massive bills (Hanz, 2009).

It has been noted that without strict codes in place, some employees deliberately misuse their phones, and make personal phone calls (Gebauer and Shaw, 2003). The costs of mobile

phones in businesses can at times be very high though there are several ways which can be used to significantly lower the bills. In cases where employees are restricted on the use of mobile phones, the costs are normally maintained low. Use of mobile phone with dual lines or charging employees for the calls they make which are not related to the business keeps the bills low. It has also been realized that the choice of the right package with the right features and prices can also make a big difference in the cost of business (Sarker and Wells, 2003).

Most external barriers come from business related factors. Lacovou et al. (2005) suggest that there are three factors responsible for adoption include pressure from outside, the perceived benefits of the adoption of technology and the readiness of the organization. Among them, perceived benefits formed a key reason why entrepreneurs adopted and continued to use the mobile phone (Giovanni and Mario, 2003; Barua, 2005; Premkumar and Roberts, 2008)..

Tarafdar's study (2007) suggested that external environments are very crucial factors influencing the adoption of Mobile technology. He also points out that organizational and environmental characteristics are required for adoption to take place. Some studies (Ritchie and Brindley, 2005) suggested that, as a primarily external factor for adoption, the role of the government is a very important factor in the ICT adoption.

Most of the roles are related to financial supports such as tax breaks and direct support of the development of application. OECD (2000) mentioned that MSEs need more support in terms of financing compared to the large enterprises due to the fact that their characteristics portrays they to have inadequate experience and weakness of market power. Mobile phone

adoption in SMEs depends on the owner being the decision- maker. The ability of the owner in ICT's knowledge or skills definitely increases the opportunity of mobile phone technology use amongst SMEs. Reynolds (2004) found that women entrepreneurs are unlikely to adopt technologies if they are not familiar with them.

Increase in mobile phones accessibility has enabled changes in different sectors of the economy particularly the urban informal sector with SMEs changing their business thereby impacting on it as one of the fast growing sector in the Kenyan economy in terms of creating opportunities for employment (Government of Kenya, 2012). Mobile Phone Technologies have the potential to improve the economic performance of SMEs affecting almost every structural characteristic of these organizations. The usage of mobile phones is expected to gain prominence among SMEs in Kenya considering the rate at which it is used.

2.8 Access to information flow in adoption and use of mobile technology

According to Gerster and Zimmermann (2003) access to information is determined by connectivity, affordability and capability. Are the services available? Can potential clients afford the access? Do the potential users have the skills required for access? The users' skills have a correlation with their literacy technical abilities and language. The capacity of the users is a great concern not only when accessing information but also when transforming it into practical opportunities. Burrell & Matovu (2008) as quoted in Duncombe (2012) found out that it is the main challenge to accessing and providing information that is 'actionable'.

Duncombe & Heeks, (2002) argues that for the information to be effective its content should be relevant to the users' context, aligned with their interests and the information source should embody a certain level of trust while recipients should have enough knowledge and understanding to assimilate and assess the provided information. Duncombe (2012) adds that information cannot be viewed as a neutral entity, nor can it be viewed as static. This is because information which is either received as raw data or verbally should be assessed and applied in a way making it usable. This is the reason mobile phones are thought to be powerful tools that can provide entrepreneurial information because they can be able to enhance or amplify other existing community communication systems. Donner (2010) argues that mobile phones have the capacity to expand the users' freedom of choice by providing not only different types of information but also options such as text or voice to access the information.

Any time a new technology such as mobile phone is introduced, it enters into an established pattern of information and communication flows in a community. While it may adapt to these flows or disrupt them, its impact will in either case be closely related to them. An understanding of established information and communication flow, the livelihoods being pursued, skills and knowledge of the users and supporting infrastructure forms the context of mobile phone communication (Donner, 2007).

2.8.1 Conceptualizing context

Humans are able to convey ideas to each other and react appropriately regardless of the communication channels due to many factors including the richness of the language they

share, the common understanding of how the world works, and an implicit understanding of everyday situations (Muturi, 2012). When humans talk with humans, they are able to use implicit situational information. Context is hard to define as Day (2001) argues.

Day (2001) referred to context as any information used to characterize the situation of a person, place or object that is considered relevant to the interaction between a user and an application, including the user and the applications itself. This definition makes it easy to discuss mobile phone use in entrepreneurship and the stakeholders involved. Mobile phone use depends on the user's business, situation and the type of information being shared, skills and knowledge of the user, and government and non-government policies and regulations. So we contextualize mobile technology use in business entities.

2.9 Theoretical Framework

The theoretical basis for the study is mainly drawn from three theories as analyzed below.

2.9.1 Uses and gratifications theory

Uses and gratifications theory (UGT) as an approach helps in understanding how and why people actively seek out specific media to satisfy their specific needs. UGT is an audience-centered approach to understand mass communication (Severin and Tankard, 1997). Diverging from other media effect theories that question "what does media do to people?" UGT focuses on "what do people do with media?"(Katz, 1959 pg 54).

This communication theory is positivistic in its approach, based in the socio-psychological communication tradition, and focusing on communication at the mass media scale (Lynn et

al, 2007). The driving question of UGT is: what do they use media for and why they use them? UGT discusses how users deliberately choose media that will satisfy given needs and allow one to enhance knowledge, relaxation, social interactions/companionship, diversion, or escape (Tankard, 2000).

It assumes that audience members are not passive consumers of media. The audience normally has power over their media consumption as they assume an active role in integrating and interpreting media into their own lives. Comparing this with other theoretical perspectives, UGT holds that audience is responsible for choosing media to meet their desires and needs to achieve gratification. This theory would imply then that the media compete against other information sources to gratify viewers (Katz, 2011).

Levy and Windahl (1985:35) provide a good description of what it means to be an "active consumer" of media:

“Commonly as understood by researchers doing gratification studies, the term "audience activity" means a voluntaristic and selective orientation by audiences towards the communication process. In brief, it suggests that media use is motivated by needs and goals that are defined by members of the audience themselves, and that actively participating in the process of communication may limit, facilitate, or influence the gratifications thus the effects are associated with exposure. Current thinking also proposes that audience activity is best conceptualized as a variable construct, with audiences showing varying kinds and degrees of activity.”

The use of mobile phones by women owning business is propagated by the fact they want to get information, reach their customers and also make business transactions. So to them the mobile phone services meet their economic need and hence gratify them.

2.9.1.1 Assumptions of the theory

Compared with other media consumption theories, UGT postulates that consumers are given power to choose the type of media to consume based on the prediction that consumers have clear intention to use it. This assumption contradicts theories which have been used previously like mass society theory which assumes that people are normally helpless victims of mass media produced by companies which have been established; and individual differences perspective which postulates that self-esteem and intelligence are the main drivers of choice of media by individuals.

Uses and gratifications theory has the following assumptions;

1. The audience is active and its media use is goal oriented. Applied to this study, the assumption is that women will use the mobile phone because they want to achieve the goal of making more income and thereby empowering them. They choose which media they would use to give them desired results.
2. The initiative in linking need gratification to a specific medium choice rests with the audience member. As applied to this study, the choice of medium rests with the individual entrepreneur who decides which benefits they hope to get from adopting and using it.
3. The media compete with other resources for need satisfaction and people have enough self-awareness of their media use, interests, and motives to be able to provide researchers with an accurate picture of that use.

4. The audience can only assess value judgments of media content. When used in this study, women entrepreneurs will individually assess which media best suits their businesses functions.

2.9.1.2 Application of the Mobile phone to uses and gratification theory

Mobile phones, a comparatively new technology have been found to attract many uses and gratifications. This is propagated by their mobility nature, their accessibility which is normally constant and their characteristic that they have options to add and access content.

In general, people use mobile phones for the following uses and gratifications: affection/sociability, entertainment, instrumentality (information seeking, talking to business partners and coordination of business), psychological reassurance, fashion/status, mobility, and immediate access (Blumler, 2011).

2.9.1.3 Critique of Uses and Gratifications theory

Although the approach in uses and gratifications has significance in communication research, the research, it has received criticisms both on its theory and methodology represented.

According to McQuail (1994), the approach has not had casual explanation or much successful prediction of media use and choice. The fact that most media use are circumstantial and motivated weakly, It seems that the approach can work best in examining particular types of media where motivation is present. In this case the specific media is mobile technology so this theory suits the study.

However, this study will use uses and gratification theory because of its practicability in the use of the mobile phone technology services by women entrepreneurs. As mentioned earlier uses and gratification approach is centered on the audience and what the audience do with the media. In this case the audience is women entrepreneurs and the media is the mobile phone which they can use the different applications in their phones to run their businesses. For example, they can use the mobile phone to market their products, use Mpesa services to buy and pay for their goods, get information and reach other markets. Therefore, they can manipulate the mobile phone for their gain.

2.9.2 Technology Acceptance Model

Davis (1986) developed the Technology Acceptance Model based on the theory of reasoned Action which specifically deals more with the prediction of the acceptability of an information system. This model serves to predict the acceptability of a communication tool and to help in identify modifications to be brought to the system to make it more acceptable by users. This model suggests that acceptability of an information system is influenced by factors such as the perceived usefulness and perceived ease of use.

Perceived usefulness is defined as being the degree to which a person believes that the use of a system will improve his performance. In this study, women entrepreneurs would adopt mobile technology when they perceive that it is useful in their business operations. The mobile phone has many features e.g. making calls to reach customers, suppliers and other stakeholders, internet to access markets and Banking facilities.

Perceived ease of use points to the level to which a person believes adoption of the use of a system will be effortless. Several factorial analyses demonstrated that perceived usefulness and perceived ease of use can be considered as two different dimensions (Hauser et Shugan, 1980; Larcker et Lessig, 1980; Swanson, 1987). Women avoid any technology which they feel is hard and requires learned skill (Kotelnikov, 2007). Among all technologies, mobile technology is termed as the easiest to operate requiring limited skill. Women entrepreneurs can therefore incorporate mobile technology in their business so that they can benefit fully from the services mobile phone technology offers.

The Technology Acceptance Model postulates that behavioral intention determines the use of an information system while behavioral intention is influenced by the person’s attitude and perception towards the use of the system. According to Davis, individual’s attitude is not the only determinant of their system use but is also based on the impact on their performance. As such, in cases of non welcoming of information system by an employee, the probability that they will use it is high they perceive that the system to improve their work performance. Furthermore, the Technology Acceptance Model postulates that there is a direct relationship between perceived ease of use and perceived usefulness. In cases where there are two systems offering the same features, a user would find the one that he finds easier to use to be more useful (Dillon and Morris, on 1996).

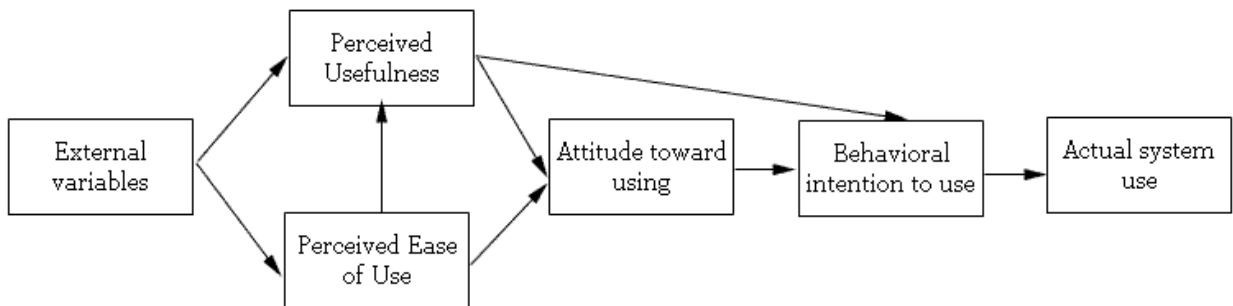


Figure 1: Technology Acceptance Model from Davis, BagozzietWarshaw (1989)

Davis (1986) argued that the perceived ease of use of any system influences the attitude of an individual in a significant way through the mechanisms of instrumentality and self-efficacy. Bandura (1982) developed the concept of self efficacy which explains that the more a system is easy to use, the greater should be the user's sense of efficacy. He further explained that easy to use tools makes the users feel that they have control over what they are doing (Lepper on 1985). As such, efficacy is one of the main determinants of intrinsic motivation (Bandura on 1982; Lepper on 1985) and as such illustrates the direct link between attitude and perceived ease of use.

The perceived ease of use can also contribute in an instrumental way in improving a person's performance. This is based on the fact that the user has to deploy less effort with a tool that is easy to use thus sparing effort to accomplish other tasks (Davis, on 1986). It is however interesting to note that the research presented by Davis (1989) to validate his model, demonstrates that the relationship between the intention to use an information system and perceived usefulness is stronger than perceived ease of use. According to this model, it is therefore expected that the major determinant of use of a system is the perceived usefulness of a tool.

2. 9.2.1 Critique of the TAM model

Initially, TAM model was validated empirically though only a fraction of the variance of the outcome variable, IT usage (from 4% to 45% (McFarland and Hamilton, 2006). As such, many authors have refined the initial model, trying to find the latent factors underlying perceived ease of use and perceived usefulness.

This study applied the use of Technology Acceptance Model due to its practicality in entrepreneurship environment. Studies such as Reynolds (2004) and Kalundo (2012) have found that women will adopt technologies which are easy to use and the technological usefulness is evident, and these are also the two main factors of TAM.

2.9.3 Empowerment Theory

According to Friedmann (1992), empowerment is a transformative process within human existence from the state of powerlessness to the state of relative control over one's overall existence by taking control over his destiny and making use of his immediate environment for a sustainable improvement in their livelihoods and better standards of living. Microfinance which has emerged as a tool of community empowerment and poverty alleviation surrounds the discussion of empowerment theory.

This theory is an alternative development approach resulting from the failures of mainstream development theories to address poverty situation in developing countries due to their emphasis on pursuit of industrialization and growth (Bhagat, 2007). This has pushed poor people in a downward spiral of resource deficit trapped in a vicious life cycle of poverty. Robert Chamber described the situation as 'the deprivation trap' and Gunnar Myrdal agreed with him and calls it the 'vicious cycle' calling for the need to address it.

Alternative development approach came from this disillusionment and hence empowerment theory which emphasizes on grassroots participation by the poor in the decision making process against centralized development policies designed and carried out by politicians and

international organizations alike (Friedmann, 1992). The theory restores the abilities of the underprivileged on the basis that unless they take an active part in the development process and in control of their own destinies, sustainable development and the so-called poverty alleviation will remain a distant dream. This theory shows a direct opposition to the top-bottom approach on development. It is people-centered approach geared towards addressing the needs of the poor and how to use their initiatives, potentials and capabilities and move themselves out of the malignant deprivation of poverty as a result of being empowered.

According to Friedmann (2012), empowerment theory is an alternative development approach based on the fact that most situations entailing poverty in developing countries are associated with households where the burden is on women. He attacks the traditional basic needs approach by World Bank as ‘politics variant’ based on the fact that it is centered on politics rather than the process where the underprivileged identify their needs and how to satisfying those needs. He therefore advocates for a complete change in the structure of the prevailing political systems which is dominating in the spheres of power and patriarchy all aimed at eradicating the poverty conditions of the poor and disempowered with emphasis on the rural areas (Perkins et al, 1995). He praised the creativity and mobilization of women through their self-determination and collective efforts in ascertaining their position in the process of empowerment in the midst of the shrinking economic opportunities.

This study will use the empowerment theory since women especially in the developing countries have been among the groups that have not been empowered (Worner et al, 2009) For women to be empowered, they have to participate in development projects which grow

their income hence become capable of improving their standards of living. Starting up entrepreneurs and successfully sustaining them is one major way of impacting positively in their lives. Incorporating technology and especially mobile phone technology services is one way of boosting their businesses because they will be able to compete with other groups of entrepreneurs and especially men. Therefore, this theory reinforces and informs to the area of the study in that for women to be empowered and break the gender gap, they need to have sustainable livelihood through adopting technology in their entrepreneurial activities.

2. 10 Conceptual Framework

Conceptual framework has been defined as written or visual product giving a graphical explanation of the variables under study such as key concepts or factors showing their presumed relationship (Miles and Huberman, 1994). As such, a conceptual framework is a conception model of what one plans to study.

The conceptual framework postulates that women empowerment from mobile phone technology depend on the adoption and dimensions of use. According to Porter (1985), information and communication technologies can be used to improve almost any primary and supporting activities which increase the output in any business organization.

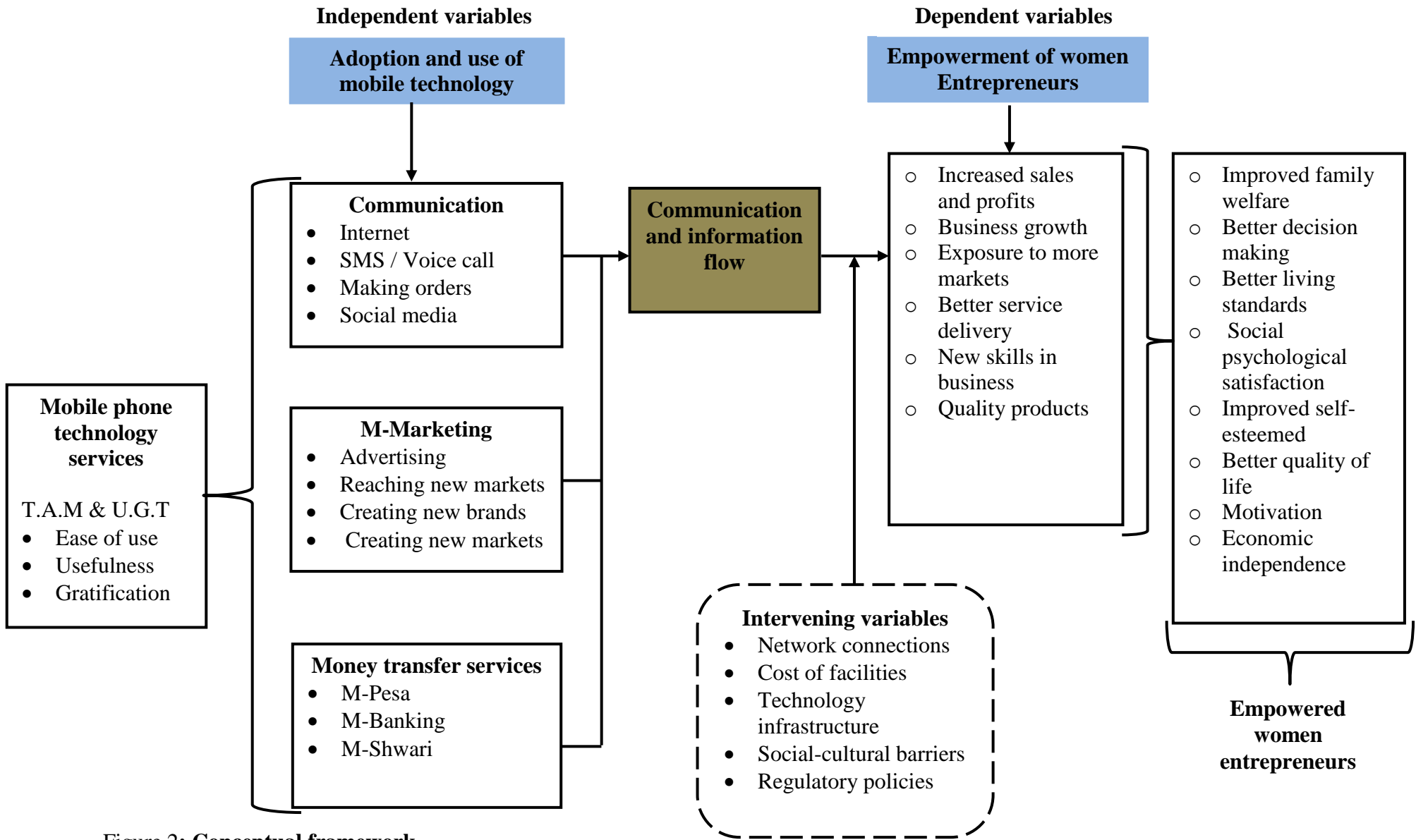


Figure 2: **Conceptual framework**

Source: Researcher, 2015

The above conceptual framework establishes the relationship between adoption and use of mobile phone technology to empower women entrepreneurs. When women adopt and use mobile technology into their businesses, they become empowered, they are able to increase their sales, their businesses grow, and they acquire more skills and get exposure to more markets through the right communication and information flow (Leong et al. 2011).

The independent variable of the study is Adoption and use of mobile phone technology services and its measurable variables will include; communication, money transfer services and M-marketing.

i. Communication

Mobile phones have been used to serve different purposes such as keeping in touch with family members, business transactions, and reaching people during emergency. It has been found that some people have more than one mobile phone which are used for different purposes entailing those for personal use and for business.

Generally, the use of internet has been classified to be public, self-sustaining and cooperative facility which is accessible by hundreds of millions of people across the world. The internet has many applications which the women entrepreneurs can use to reach out to new and existing customers through advertising their products in their mobile phones which is cheaper compared to advertising through other media. By using the internet, the women can reach out to virtual markets and sell or buy their products online. They may also make orders to their suppliers using SMS thereby limiting the amount of time spend travelling. Some of the applications in the mobile phone include; email, viber, whatsApp, OLX, LinkedIn and

facebook. Once one registers as a member to any of the applications, you are able to communicate to other people who have registered. This leads to a huge market base of one's products and services (Saren, 2011). This study will base mobile phone communication as one of the empowering factors for business growth.

ii. Mobile marketing

Women entrepreneurs can use their mobile phones to market their products to target customers. The advantage with mobile marketing is, it can reach out to many people thereby increasing their customer base. The mobile phone will enable the women entrepreneurs reach out to new markets without necessarily physically being there.

iii. Money transfer services

Mobile phone has been used to provide mobile banking services which include its ability to transfer cash by secure text messages. M-PESA mobile banking in Kenya's service is a good example as it allows mobile phone operator Safaricom to hold cash balances recorded on their SIM cards. M-PESA accounts facilitates cash deposited and withdrawn from any Safaricom retail outlets across the country thus allowing electronic cash transfer from person to person as well as facilitating bill payment to companies.

M-PESA has attracted 9.5 million customers since its inception in March 2007 representing over 40% of Kenya's adult population. As such, the service meets the need for secure money transfer at low-cost (Mulwa, 2012). Women entrepreneurs can use their mobile phones to transfer money to their suppliers, pay utility bills and get paid through their registered paybill

numbers or through their M-PESA accounts without physical conduct thereby saving valuable time.

The dependent variable in this study is empowering women entrepreneurs. The study postulates that when women entrepreneurs adopt and use the different mobile technology services in their businesses, they get empowered as shown by continuous arrows. The measurable parameters of empowerment include; increased sales and profits, business growth, increased level of business skills, increased family welfare, better service delivery and to acquire new skills.

The intervening variable which might affect the relationship between adoption and use of mobile technology to empower women entrepreneurs will be network connection and cost of facilities as it was established by Feig (2007). Many parts of the country have poor network connection thereby affecting the use of the mobile phone. The cost of the phones and airtime is high for a local entrepreneur.

The relevance of this framework to the study is establish if the use of mobile technology will influence the women entrepreneurs in adopting the service for transferring money, communication and marketing their products to increase their sales, grow their business and improves their livelihood.

2.11 Research Gap

Most of the studies that have been carried out so far on mobile phone services are business oriented but have not focused on gender related issues. This study therefore chose to analyze

the adoption and use of mobile phone services by women only. None of the studies have a communication and information flow component so there is usually a disconnect between the row out of a technology innovation and its adoption by the entrepreneurs due to lack of proper communication flow. This study focused on the aspect of communication and information flow of technology adoption by women entrepreneurs from the row out of the innovation to its adoption.

This study filled the gap left behind by previous studies by analyzing the communication and information flow in the adoption process. Communication flows in a consistent pattern for it to have the desired results. The source of the innovation (service providers) encodes the message (mobile phone applications) then uses the most suitable channel to pass the message depending on availability of the channel and the demographics of the audience. Then the audience (women entrepreneurs) decodes the message and uses it, then through monitoring and evaluation, the stakeholders are able to see its impact on the entrepreneurs and remodel it accordingly. Through this process, a technology can be adopted fully to give the desired results. The stakeholders underscore the importance of communication process when rowing out a new mobile application.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter outlines the procedures and methods that were used in the research study. It describes the type of research design that was used, the target population, sample size, sampling design, and finally pre-testing of the research instrument. It further describes the data collection instruments and the procedures that were used in collecting the data, data analysis and presentation of the research findings.

3.1 Research Site

The research was conducted in Machakos municipality of Machakos County. Machakos County is a county of Kenya and its capital is Machakos town. Its largest town is Machakos town, Kenya's first administrative headquarters. The county has a population of 1,098,584 (the Kenya Government, 2014). It has 10 administrative divisions as shown below;

Table 2. Administration Division for research site

Administrative Division	Population	Urban population
Kalama	41,000	0
Kangundo	91,238	3,786
Kathiani	95,096	2,929
Machakos Central	143274	26,438
Masinga	74,478	654
Matungulu	99,731	4,734
Mavoko	48,936	19,177
Mwala	89,211	2,708
Ndithini	32,358	0
Yathui	65,567	481

Source; KNBS (2013)

The county borders Nairobi and Kiambu counties to the West, Embu to the North, Kitui to the East, and Makueni to the South, Kajiado to the South West, and Muranga and Kirinyaga to the North West. The study area was Machakos municipality.

Machakos municipality was chosen because the generalizations are applicable across the county and other counties sharing the same socio-economic conditions as those of Machakos County. The county has a semi-arid climate; this means rainfall is minimal so agricultural activities are mainly subsistence farming (KNBS, 2009). So the main activity to earn a living is through entrepreneurial activities. Machakos County shares similar conditions with over forty counties. It is in a rural set up like most of the other counties therefore it can represent most of the other counties.

Machakos County has a literacy level 88% according to Kenya Bureau of Statistics (2012). This means that the women entrepreneurs have basic education and can adopt and use mobile phone technology which requires some basic education.

Machakos County is within the Greater Nairobi metropolis which consists of 4 out of 47 counties in Kenya and the area generates about 60% of the nation's wealth (KNBS, 2013). The counties are Nairobi, Kajiado, Kiambu and Machakos. As shown in the table below, Machakos County has the highest poverty index (59.6%) as compared to the other counties which make the greater Nairobi metropolis. This means that lack or minimal technology adoption may be one factor which may cause the large disparity due to low income which in turn leads to high poverty level as shown in the table below.

Table 3. Poverty Level in Nairobi Metro (Percentages)

County	Poverty Level in Nairobi Metro (Percentages)
Kajiado County	11.6
Kiambu County	21.8
Nairobi County	22
Machakos County	59.6

Source; KNBS (2013)

The county is taking advantage of projects such as the Konza Technology City, a new Machakos City and its proximity to Nairobi County to boost output in the economy. But if technology is not well adopted, the county will not benefit from any of the three projects. Konza Technology city will be the third in the world after Silicone City in the USA and Bangalore City in India which have benefitted the business community around them by adopting to technology and especially mobile phone technology services (Frempong, 2009).

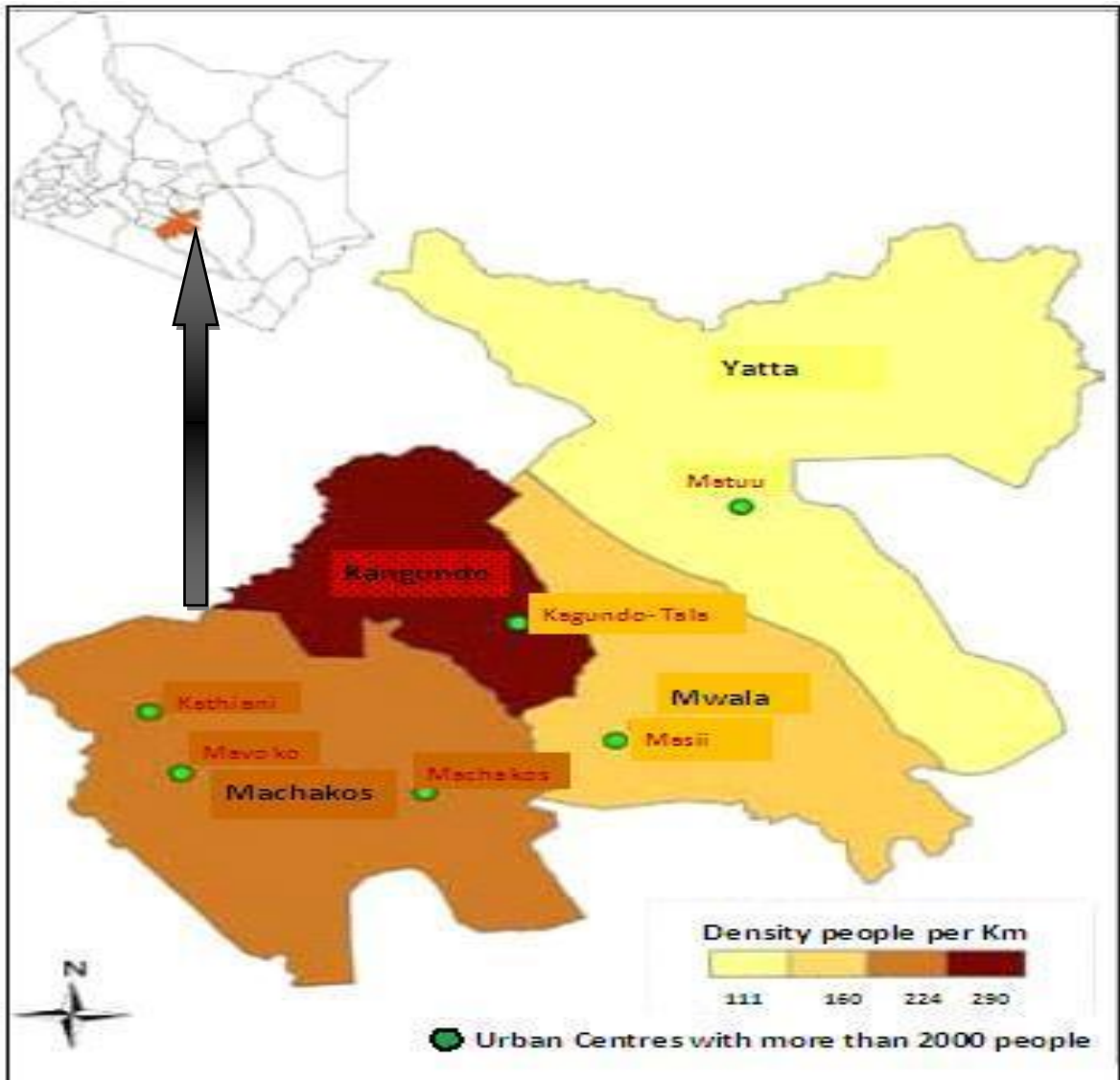


Figure 3: Map of Machakos County

Source: Developed by the author based on Machakos website (2015).

3.2 Research population

The study population was women entrepreneurs in Machakos municipality. According to Kothari (2004), a population is a set of people, services, elements, and events, group of things or households under investigation. Mugenda (2003) explains the population targeted

should have the characteristics which the researcher intends to generalize the results of the study. The definition ensures that population of interest is homogeneous. Currently the total number of entrepreneurs registered at Machakos town under the title: Machakos Town Women Entrepreneurs is 5,020 women (Machakos County report, 2014).

3.3 Research Design

This study used mixed methods research approach. Mixed methods research is a design that integrates both qualitative and quantitative approach (Creswell & Plano Clark 2007). It focuses on collecting, analyzing and mixing both quantitative and qualitative data in a single study or series of studies. Mixed methods is considered suitable because it attempts to make legitimate the multiple uses of approaches, rather than restricting or constraining the researchers' choices as Johnson & Onwegbuzie (2007) indicate.

Mixed methods allows for triangulation of the information got from both quantitative and qualitative data collected. The purpose of this design was to obtain different but contemporary data on the diffusion of information and communication technologies in the entrepreneurship sector in Machakos County. The intention of using the triangulation design was to bring together the differing strengths and non-overlapping weaknesses of quantitative methods (large sample size, trends, and generalizations) with those of qualitative methods (Patton, 1990).

3.4 Sample Size and Sampling Procedures

3.4.1 Sample size

A sample size is a subset of the population to which a researcher intends to generalize the results. The sample size calculation was based on Fischer et al (1984) and cited by Mugenda and Mugenda (2004). Fischer et al. argue that the ideal sample size for any population above 10,000 is 384. To calculate the sample size of population below 10,000, finite population correction method is used to reduce the necessary sample for small populations.

$$nf = \frac{n}{1 + (n/N)}$$

Where:

nf = the desired sample size (when the population is less than 10,000)

n = the desired size (when the population is more than 10,000)

N = the estimate of the population size

The sample size therefore will be:

$$nf = \frac{384}{1 + (384/5020)}$$

$$nf = \frac{384}{1.08}$$

$nf = 350$. The sample size for the quantitative data was 350 women entrepreneurs.

3.4.2 Sampling procedures

According to Breakwell (2006), sampling is the process of selecting a number of individuals for a study in such a way that the individual represents a larger group from which they are selected. Sampling means choosing a given number of subjects from a defined population as its representative. Sampling is the procedure a researcher uses to gather people, or things to study. It is a process of selecting a number of individuals or objects from a population such

that the selected group contains elements representative of the characteristics found in the entire group (Orodho and Kombo, 2002).

The study adopted probability and non-probability sampling techniques. Systematic random sampling was used to collect quantitative data. Systematic sampling consists of selecting every *kth* case from a complete list of the population (Singleton, 1988). Using the population of registered women entrepreneurs as the sampling frame, the sampled number was divided with the population size to get the sampling interval. The sampling interval is the ratio of the number of cases in the population to the desired sample size. The researcher then selected a random number between 1 and this value to give the first respondent of the sample and also act as a starting point for the selection of the rest of the respondents (Mulusa, 1990). From this point, every *kth* from the population sample was picked.

The advantages of using systematic sampling are that large populations can be analyzed, every member of the population has an equal chance of inclusion and bias is minimized (Kombo and Tromp, 2006). Purposive sampling was used to pick the key informants and focus groups participants to be interviewed. The key informant interviews included women group leaders, service providers, County official and policy makers while there were too focus groups each comprising of 6 participants.

3.4.3 Data collection process

The study used sequential exploratory mixed method to collect data. Sequential exploratory method is used to collect both qualitative and quantitative data with priority given to qualitative data (Mutwiri, 2012). The qualitative data that was analyzed first to assess

whether the research questions and conceptual framework themes and concepts could be generalized to all women entrepreneurs. The findings from the qualitative data collection methods were then used to develop the quantitative data collection instrument (survey questionnaire).

3.5 Data Collection Methods

3.5.1 Qualitative Data

3.5.1.1 Key informant interviews

Qualitative data was collected by interviewing key informants. Eight (8) key informants were purposively sampled to participate in in-depth interviews. The interviews were of a conversational style rather than a formal question-answer format (Campbell et al, 1999). The Key informant interviews comprised of 2 women group leaders comprising of the chairlady and the secretary, 2 officials in charge of ICT and business from the service providers (one from Safaricom and the other from Airtel), 2 officials from the Ministry of Information Communication and Technology and 2 county officials in charge of business development and licensing.

Key informant interview ensures that the reliability of the information gathered is high since it comes from people with knowledge and experience in technology and entrepreneurship. It also gives in-depth information on specific issues (Kombo and Tromp, 2006) as quoted by Ndeti (2012).

3.5.1.2 Focus Group Discussions

These are discussion groups composed of 6-8 participants who share certain characteristics which are relevant for the study. The discussion is carefully planned and designed to obtain information on the participants' beliefs and perceptions on a defined area of interest (Kombo and Tromp, 2006). Focus group discussions can generate a lot of information within a short time and are good at exploring ideas and opinions in the community.

Two Focus Groups discussions were held in this study each comprising of 6 women entrepreneurs. Care was taken to ensure that the members of the group were familiar with each other. Familiarity has an advantage of reducing initial tension or embarrassment (Ndeti, 2012). Focus group discussions have the advantage of getting in depth information since it is done in conversational manner and it's not limited to writing.

3.5.2 Quantitative Data

The survey method was used to collect quantitative data. A self-administered questionnaire was used to obtain data from respondents. The structured questions had a list of all possible alternatives from which the respondents selected the answer that best describes their situation. An advantage of using self-administered questionnaires, according to Campell et al (1999), is that they are appropriate methods for obtaining data from literate study populations. Questionnaires can cover a wide area and they are not biased on the side of the researcher and the respondents (Kombo and Tromp, 2006).

3.6 Data Analysis and Presentation

Data analysis is the process of bringing order, structure and meaning to the mass of information collected.

3.6.1 Quantitative data

This entails presenting and interpreting numerical data. The responses collected from the questionnaires were checked for completeness and consistency and where errors were detected, necessary cleaning was done. The results of the research were quantitative information. The quantitative data collected was keyed in and analyzed using descriptive method through the aid of the Statistical Package for Social Sciences (SPSS). The results were presented using tables, percentages, and bar charts.

3.6.2 Qualitative data

Qualitative data was analyzed and presented drawing from Zikmund (2003) three major phases of qualitative data analysis and presentation: Data reduction, data display (presentation) and drawing conclusion.

Data reduction is the process of choosing, focusing and simplifying, abstracting and transforming the data that appear in written up notes. This was done using a codebook that was developed using themes and concepts from research questions, literature review and the conceptual framework and then condensing the codes. This helps in manageability and also put the data into considerable terms of the issues being discussed (Mutwiri, 2012).

Data display: The information was displayed in quotations and narrative forms which either supported or contrasted the quantitative results. Conclusions were drawn after comparing the results of both quantitative and qualitative data.

3.6.3 Integrating Qualitative and Quantitative data

In mixed research studies, findings obtained from both analysis phases may be interpreted separately or combined and interpreted at the data interpretation stage (Caracelli & Green, 1993). This research used the latter by combining quantitative and qualitative data and interpreting it at the interpretation stage

3.7 Validity and Reliability

3.7.1 Piloting

Piloting test was conducted with a sample of 20 respondents who were not among the final 350 respondents for the study. The pilot study was necessary to determine validity of the research instruments and enable the researcher to determine whether the respondents understand the questions. After piloting, the researcher made changes to the questionnaire to remove ambiguity and double meanings. The researcher also simplified the language after noticing that some women didn't understand some technological words.

3.7.2 Validity

Validity refers to the degree to which an instrument measures what it intended to measure Kombo and Tromp (2006). In order to ensure the validity of these instruments, the researcher constructed questions which the respondents would only answer to the research questions.

According to Joppe (2000), validity determines whether the researcher truly measures what is supposed to measure.

3.7.3 Reliability

Reliability refers to the degree to which a particular measuring procedure gives similar results after repeated trials. Reliability test was computed using internal consistency test using the Cronbach's coefficient Alpha (a general form of Kuder-Richardson formula):

$$KR_{20} = \frac{(K)(S^2 - \Sigma s^2)}{(S^2)(K - 1)}$$

KR_{20} = Reliability coefficient of internal consistency

K = Number of items used to measure the concept

S^2 = Variance of all the scores

s^2 = Variance of individual items

A value of KR_{20} equal to or more than 0.7 (70%) indicates that the data collected is consistent. In this study, 0.70 value was used to indicate reliability of the questionnaire (Creswell, 2009). The parameters to be measures in each objective were put in the SPSS to test the reliability of the questions and they all gave a value above 0.70 meaning that the data collected was consistent.

3.8 Ethical Considerations

This study adhered to ethical research considerations and professional guidelines. The researcher obtained relevant research permits from the University of Nairobi, National Commission for Science Technology and Innovation, Machakos County Commissioner and County Education Officer before the commencement of data collection. During data collection the researcher and his assistants explained the aim of the study to respondents, in

order to get their consent. The role of the Research assistants was to administer the questionnaire to the respondents. They were trained on how to administer the questionnaires and also how to record the responses.

Information collected was treated confidentially and was utilized for academic purpose only. Respondents were requested to first confirm that their participation was voluntary and as such, they had a right to refuse to answer any questions or even withdraw from the study at any time. Before each session, the participants were requested to sign a consent form to show their willingness to be part of the study. Those who were involved in in-depth interviews and FGDs were asked to consent to audio recording of their discussions. No monetary incentives were provided.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

4.0 Introduction

This chapter presents and analyses qualitative and quantitative data from key informants focus groups discussions and survey questionnaire. Concurrent mixed methods procedure was used, whereby the researcher converge both qualitative and quantitative data used to analyze the research problem comprehensively (Cresswell, 2003; Tashakkori and Teddlie, 2003). In this design, both forms of data are collected at the same time and triangulated for interpretation of the overall results.

4.1 The Response rate

The study had a response rate of 94.8%. A total of 350 questionnaires were distributed to women entrepreneurs in Machakos municipality. A total of 332 questionnaires were returned dully filled. 18 were found to have been incomplete with some missing crucial data and therefore unsuitable for analysis. According to Kerlinger (1986), a response rate of 80% and above is good enough for a research. So the response rate of 94.8% was sufficient for this study.

4.2 Qualitative data

The qualitative data produced from the focus group discussions and the key informant interviews were transcribed and coded into common themes. The themes in qualitative data were interpreted using thematic analysis. A narrative report enriched with quotations from key informants and focus group participants was written and triangulated with quantitative responses in order to capture convergence or difference. Data from the survey, the key

informant interview and the focus group discussions were triangulated to enhance the reliability and validity of the results.

4.2.1 Categorization of respondents

A total of 20 respondents for this study were purposively chosen to get the qualitative data and were classified in the table below (where F stands for focus group discussion participant and K for key informant) for ease of analysis of findings in terms of respondents category, data collection methods and instruments used.

Table 4. Categorization of respondents

Category	Respondents	Data collection method	Research instrument
F Women entrepreneurs	12 women entrepreneurs	2 FGDs each with 6 women	Discussion guide
County officials	K1- county official K2- county official	Key respondents interviews	Interview guide
Women group leaders	K3- women group chairlady K4- women group secretary	Key respondents interviews	Interview guide
Service providers	K5- safaricom mobile service manager K6- airtel mobile service manager	Key respondents interviews	Interview guide
Ministry of ICT officials	K7- ICT official K8- ICT official	Key respondents interviews	Interview guide

4.3 Description of the Demographic Factors of the Respondents

4.3.1 Age of the respondents

Table 5. Demographic Factors of the Women Entrepreneurs in Machakos County

Age in years	Frequency	Percentages
18-27	125	37.7
28-37	70	21
38-47	69	20.8
48-57	54	16.3
58-67	10	3
68-77	3	.9
78-87	1	.3
88 above years	0	0
Total	332	100

The study was conducted in Machakos municipality for the purposes of establishing the extent of adoption of mobile phone technology services by women entrepreneurs in running their businesses. Table 4 that presents the demographic factors of the women entrepreneurs who participated in the study, revealed that the representation of the women in business was more between the age of 18- 37 years (58.7%), while between 38-57 years were only (37.1%) and the rest (58- 88 years) were 4.2%.

The psychological characteristics that determine an entrepreneur as explained by Brockhanus in 1982 states that the ability for one to be a vibrant business person works well with young age and decreases as one advances in age. Therefore in Table 4 the investigation brings the picture out clearly that, the women who were in business at young age were more than their counterparts in the advanced age (58.7% and 4.2% respectively). This might be caused by the desire to achieve more, the need to be a boss of their own in business and the ability to navigate through the challenges of new technology in business that might be a challenge to the advanced age group. In addition, the findings conform to the model of Maxwell &

Weststerfield (2002) that talks about technological entrepreneurship characteristics that determine the innovativeness of an individual in adopting technology in business, since the model illustrates that innovativeness ability works well with young age than with the advanced age which is clear with the findings of this study.

A key informant in the county offices supported the findings and informed the researcher that majority of the women entrepreneurs who registered their businesses in the county were below 40 years. The women group chairlady also concurred and added,

K3: In our group, apart from me who is above 40 years of age, the rest are below 40 years. Most of the women entrepreneurs in our county are young and they adapt well to any changes in the business world. I like working with them because they are open to challenges and have a vision for their businesses.

4.3.2 Marital Status of the respondents

Table 6. Marital status

Marital status	Frequency	Percentages
Married	190	57.23
Single	115	34.64
Widowed	14	4.22
Divorced	10	3
No answer	3	0.91
Total	332	100

The same findings also exposed an interesting figure for the marital status, that out of 332 participants 190 (57.23%) of the women entrepreneurs in Machakos municipality were married while 115 (34.64%) were single and 24 (7.22%) of the participants were either divorced or widowed.

This contrasts with other studies that were done on women entrepreneurship (Macoy& Smith, (2007); Athanne, (2011) & Haynes, (2011) whose results portrayed that majority of

the women in business were either single, divorced or widowed since they are pushed into business because of the conditions that they find themselves in economically or the need to be independent.

4.3.3 Education level of the respondents

Table 7. Educational level

Education Level	Frequency	Percentages
Primary	44	13.3
Secondary	151	45.5
Tertiary	19	5.7
Undergraduate	55	16.6
Postgraduate	51	15.3
No answer	12	3.6
Total	332	100

Table 6 analyzed the educational level of the women entrepreneurs in Machakos County. Those who had a basic education level of primary and secondary were 195 (58.8%) while those who had an advanced education level of tertiary, undergraduate and postgraduate were 125 (37.6%) respectively. The implication of the findings is that, the level of education does not necessarily determine the entrepreneurship ability of an individual. From the study, those who had high level of education in Machakos municipality seemed to be more interested in professional jobs than business and that is why the majority of those who had basic education (58.8%) among the 332 respondents were involved in successful entrepreneurship ventures.

The findings contrast with most of the studies done example being the one done in Latin America by Llisterri et al.(2006) who differentiated between two types of entrepreneurs (“necessity” and “opportunity”). Their study posits that opportunity entrepreneurs (those who seize a business opportunity) had high levels of education and came from upper or middle

class and their ventures were successful and sustainable while the “necessity” entrepreneurs had basic education and came from low income class whose ventures were very fragile. In conclusion, this study finds that the women with basic education were better entrepreneurs and their ventures were sustainable not as mentioned by Llisterri meaning that education was not the key determinant for entrepreneurship characteristics. This was supported by the two focus group participants who all had basic education and were able to run their businesses.

4.4 The extent of mobile adoption in business by women entrepreneurs in Machakos County

4.4.1: Women Entrepreneurs mobile phone ownership

Table 8. Mobile phone ownership

Response	Frequency	Percentages
Yes	329	99.1
No	1	0.3
No answer	2	0.6
Total	332	100

The study found out that the majority (99.1%) of the women entrepreneurs own their mobile phones for purposes of doing businesses. This is similar to the studies carried out by (Strategic Growth Concepts, 2013 & Donner & Escobari, 2010) both in developed and developing countries case Kenya and Uganda, where it was established that majority of women entrepreneurs were using mobile phone technology services in their businesses.

Two key informants from the service providers, Safaricom (K5) and Airtel (K6), concurred that almost all women entrepreneurs in the county owned a registered mobile phones. From their data base, 90% of businesses owned by women had a registered mobile phone. A key informant who’s the chairlady of a women group informed the researcher that all women in

the group owned one or two mobile phones, since mobile phone is their tool of trade. She quipped,

K3: Doing business here without a mobile phone is like going to dig without a hoe. I don't know what I would do without a mobile phone. It has become part of our lives. You cannot even be a member of our group if you have no mobile phone because you will be the odd one out.

All participants in both focus groups had mobile phones for their businesses and some had a mobile phone each for the two networks of Safaricom and Airtel. One participant said,

W2: The mobile phone is the most important partner in business, you cannot operate without one. You can survive in business without workers but you can't survive without a mobile phone because you can perform many duties with it in your premise as you sit."

4.4.2: Type of social media mostly used by women entrepreneurs

Table 9. Type of social media used for business by women entrepreneurs

Social media	Frequency	Percentages
Facebook	123	37.1
Twitter	19	5.7
Linked In	1	0.3
Tag	4	1.2
WhatsApp	79	23.8
No answer	106	31.9
Total	332	100.0

The study found that most women entrepreneurs use Facebook (37.1%) and WhatsApp (23.8%) social media to reach out to their customers and market their products. This finding is in agreement with the study done by (Cherie Blair Foundation for Women, 2012) which found that most marketing of business by women entrepreneurs is done through social media and especially Facebook although the results show that the usage is below average.

This contradicts the comments of the focus groups, because all the participants in the focus groups said they used WhatsApp more than Facebook because WhatsApp is easy to use once

it's downloaded in the phone, one does not need an email address and password to open it like Facebook. One participant quipped,

W6: I always forget the password to my Facebook address therefore I have stopped using it and use whatsApp which doesn't need password. In fact, most of my customers prefer that we communicate through whatsApp because it is easy and cheap as long as you buy daily bundles.

A manager at Safaricom service provider informed the researcher that most women only inquire about and ask for assistance to download whatsApp more than any other social media. WhatsApp has gained dominance over the other social media channels since it is easy to use. This finding also tallies with the TAM which stipulates that women adopt easy to use technology and avoid any technology which they feel is hard and requires learned skill (Kotelnikov, 2007).

4.4.3 Accessing information by using the mobile phone

Table 10. Information accessibility

Response	Frequency	Percentages
Strongly agree	122	36.7
Agree	176	53
Not sure	20	6.1
Disagree	7	2.1
Strongly disagree	4	1.2
No answer	3	0.9
Total	332	100.0

Most of the respondents interviewed (89.7%) agreed that mobile technology services enables them to access information. This tallies with the study done by (World Bank, 2012) on information communication for development. The study found that mobile phones enable entrepreneurs to access information on market needs and financial information. It also concurs with the study done by (Muturi, 2012) which found that rural farmers depend on the mobile phone to access information about farming. The literature reviewed showed that in

India and the USA, women have adopted the mobile phone to access information about the markets for their products; thereby improving their businesses (Joseph, 2005). A key informant who is the secretary of a women group acknowledged that mobile phone enables the group members to access information about their businesses and about the women group. She said,

K4: We send information to our members on issues of our group, because of our busy schedules; we don't meet often but use our mobile phones to pass information to one another. I send notices of our next meeting through the mobile phone and members can access the meeting minutes through their emails addresses in their mobile phones, although many do not read the minutes because they don't know how to access their emails.

A key informant in the ministry of ICT (K8) informed the researcher that the ministry is taking advantage of the accessibility of the mobile phone to pass policy information to citizens instead of using electronic media like radio and TV and the ministry has noticed a positive impact, and this means that information is more accessible through the mobile phone.

4.4.4 Business type owned by women entrepreneurs in Machakos municipality

Table 11. Type of business

Type of business	Frequency	Percentages
Kiosk	83	25
Retail shop	150	45.2
Wholesale	65	19.6
Distributor	6	1.8
Producer	7	1.8
No answer	22	6.6
Total	332	100.0

The study found that most women entrepreneurs interviewed owned kiosks, retail shops and wholesales shops at 89.8% and this agrees with the findings by (Donner, J. &Escobari, 2010)

on mobile phone use by micro and small entrepreneurs in developing countries whose findings were that women entrepreneurs are gendered towards their domestic roles and that they shy away from difficult areas like distribution and production.

From the 12 participants in the two focus groups, only 2 women participants were in the distribution businesses, the rest owned a kiosk, a retail shop or a wholesale enterprise. None of them was in production. Skill base determines choice of business and when women want to earn money they turn to their domestic skills to exploit in the micro-enterprises (Gakure, 2004). This is cognizant of the cultural bias in education and training and subsequent career choices defined by cultural setting. Most African cultures perceive women as the weaker sex and hence when it comes to business, they can only perform the ‘soft’ businesses. The finding was also supported by a key informant from the county commission (K2) in charge of business development, who said that most women who come to register their businesses are either in retail or service industry.

4.4.5: Ownership of business done by women entrepreneurs in Machakos Municipality

Table 12. Business ownership

Form of business	Frequency	Percentages
Sole proprietor	250	75.3
Partnership	80	24.1
No answer	2	0.6
Total	332	100.0

Most business entrepreneurs interviewed are sole proprietors at 75.3% as compared to partnership at 24.1%. By being sole proprietors, they are able to make strategic decisions about their businesses and on which technology suits their businesses. The findings concur with a study done by (Malhotra, Sidney and Carol 2002) on measuring women empowerment

whose findings were that women who are sole proprietors were more empowered as they could make their own decisions without depending on their partners to make decisions for them.

The findings tally with the information given to the researcher by an official in charge of business monitoring and evaluation at the county offices (K2). He said that 90% of all registered women enterprises were sole proprietors. The women set up the businesses themselves and manage them. He added that when women leave formal employment, through retrenchment, retirement or optional decision they turn to self-employment. They may also open businesses on the side while still formally employed and most of them are sole proprietors.

The focus group discussion members also supported these findings since all participants were sole proprietors of their businesses apart from one who had partnered with her sister. One participant said,

F3: When I got retrenched from formal job, I used the money paid to me to set up my supplies business. I didn't involve anybody even my husband lest the business failed to pick. I wanted to try the business alone so that I may learn first. I also realized that it was easier to register a sole proprietorship than any other business.

Women will only be empowered if they are able to make critical decisions on their social and economic status. It would be easier for them to adopt whatever technology they find useful for their business when they don't need to depend on anybody to make decisions for them.

4.4.6: Type of Partnership Business

Table 13. Partnership businesses carried out

Type of Partnership	Frequency	Percentages
Family business	80	24.1
Women groups	20	6
No answer	95	28.6
No response	137	41.3
Total	332	100

The study found that 24.1% of the businesses were family businesses while 6% were women group businesses. This means that the married women consulted their spouses or other family members when running their businesses. This is in agreement with Hisrich and Peters (2002) that women consulted their spouse first on major decisions for their businesses. The findings are also in agreement with study a done by Imbaya (2004) on entrepreneurial disposition and its effects on performance among women. The study found that most performed poorly because of lack of locus of control. The decision to go into business was determined by people other than themselves and that might be a reason why their businesses where not doing well. The missing were those who didn't answer that question since they were the sole owners of their businesses and therefore and jumped that question as advised in the questionnaire. The findings indicate that most women businesses are sole proprietors. They set up, manage and run the businesses by themselves.

4.4.7: Application of mobile phones in business transactions

Table 14. Use of mobile phone in business Transactions

Response	Frequency	Percentages
Yes	289	87
No	34	10.2
I don't know	2	0.6
No answer	7	2.2
Total	332	100.0

The research found that most women entrepreneurs used the mobile phones for business transactions (87%). This agrees with the study done by (Kretschmer, 2012) on Information and Communication Technologies and Productivity Growth, whose findings were that most women acquired mobile phones in order to do business transactions from the comfort of their premises. It also agrees with Uses and Gratification theory which stipulates that users deliberately choose media that will satisfy given needs and allow one to enhance knowledge, social interactions and companionship (Tankard, 2000).

The key informant (K7) in the Ministry of ICT informed the researcher that the mobile phone is widely used by most entrepreneurs to transact business, as compared to other technologies in the county. All participants in the focus groups concurred with the findings. They all use their mobile phones to transact business. One participant said,

F4: I do almost all business transactions using my mobile phone. I send and withdraw money using my phone, I pay bills using my phone, I bank using my phone and I even call my clients. This phone does for me everything. If I was to pay people to transact all the businesses, I do I would be spending a lot of money to pay them.

4.4.8: Frequency of adoption and use of mobile technology in business

Table 15. Rate of application of mobile technology use in business

Applications	Most Often		Often		Rarely		No response	
	F	%	F	%	F	%	F	%
M-Pesa	112	33.7	86	26	24	7.2	110	33.1
M-shwari	44	13.3	47	14.2	38	11.4	203	61.1
Buying and selling products through mobile phones	72	21.7	113	34	36	10.9	111	33.4
Frequency of applying mobile phone in business transactions	81	24.4	68	20.5	36	10.8	147	44.3

The study found that the application of the mobile phone which was used most often was Mpesa at 59.7% (33.7% most often and 26% often) and only 7.2% of the respondents rarely

used it. This means that Mpesa was widely adopted as compared to Mshwari at 27.5% and both services can be used to transact business. The difference may be because of lack of knowhow to use Mshwari as compared to Mpesa which was introduced earlier and is easier to use. According to the TAM theory, women avoid technology deemed as hard to use and only adopt the technology which they feel is easier to use and requires less learned skill (Kotelnikov, 2007).

A key informant from Safaricom Limited (K5) who is the Machakos branch manager informed the researcher that Mpesa service is the most used service in their organization. This may be due to the fact that Mpesa is easy to use and it can be used by both banked and unbanked. He said,

K1: Mpesa is so popular among the entrepreneurs, in fact we had to set a different counter because Mpesa inquiries were so many. Business people wanting to deposit or withdraw huge sums of money using their mobile phones come here because we always keep a high float for them.

24% of the respondents agreed that they use mobile technology quite often to buy and sell their products. This means that mobile technology has been adopted by women entrepreneurs in transacting business although by a small percentage which contradicts with a study done by Komunte, Rwashana, & Nabukenya (2012) on comparative analysis of mobile use by women entrepreneurs in Kenya and Uganda and found out that women entrepreneurs use the mobile quite often to sell and buy products both in Kenya and Uganda.

Only 2 out of 12 women respondents in the focus groups use the mobile phone to buy and sell their products using the mobile phone. The rest said that they didn't understand how to use many of the social sites like OLX, WhatsApp and facebook.

Table 16. Increase of profits due to Mobile phone use

Response	Frequency	Percentages
Yes	258	77.7
No	27	8.1
I don't know	22	6.6
No answer	25	7.6
Total	332	100.0

It was established from the field that majority (77.7%) of the women entrepreneurs in Machakos County agreed that application of mobile technology had helped to increase the business turnover. This report agrees with the study that was conducted by (Hamerman, 2010) in the USA which found out that the majority of women entrepreneurs had opted to use mobile phones in business because it was the only way to increase their profits.

A Key informant (K1) from Machakos county office reported that there is increased turnover in women businesses and especially those who have adopted and use mobile technology services. Most women have opened new branches or have increased their stock. All respondents in the focus groups unanimously agreed that their businesses profits had increased substantially. One of them commented,

F10: Since I started using the mobile phone to transact business, my profits have more than doubled. I think it is because I can do so many things using the phone. Before I started using (the phone) I used to get less profit, such that there was no need to bank. I used to leave all the sales in my cash box. The profits were so little that I didn't see the need to waste time queuing in the bank to deposit such little amount. But nowadays, I bank almost on a daily basis. I can't dare leave the money there lest it is stolen.

4.5. Relationships between age of respondents and education, marital status, use of mobile phone in business among other variables

4.5.1: Educational Level

Table 17. Age of respondents Cross tabulation

Age	Primary	Secondary	Tertiary	Undergraduate	Postgraduate	Total
18-27	13	58	3	27	19	120
28-37	10	40	1	10	6	67
38-47	12	27	5	11	15	70
48-57	9	21	8	7	8	53
58-67	0	4	3	0	3	10
68-77	0	1	1	0	0	2
78-87	0	1	0	0	0	1
Non-response	3	0	3	3	0	9
Total	47	152	24	58	51	332

The relationship between age and education level in Table 16 shows that the age groups between 18- 37 years were the majority (187 out of 322 respondents). In this category, those with basic education were 121 while 62 respondents had higher education. Therefore the study reveals that basic education level prevailed among the women entrepreneurs in Machakos municipality. Despite the fact that basic education is perceived to be common, the analysis unveiled that the women with higher level of education had a fair representation in business since out of 322, 106 had either undergraduate or post-graduate education. This may mean that the women who became entrepreneurs with high education may have been pushed to business due to circumstances since entrepreneurship in Machakos municipality seem not to attract elite women.

4.5.2: Marital Status

Table 18. Marital status of the respondents cross tabulation

Age	Married	Single	Widowed	Divorced	Total
18-27	43	77	3	1	124
28-37	43	21	1	3	68
38-47	59	9	0	1	69
48-57	37	7	6	4	54
58-67	5	1	3	1	10
68-77	2	0	1	0	3
78-87	1	0	0	0	1
Non-response	2	0	1	0	3
Total	192	115	15	10	332

In Table 17, comparing the age and marital status of women entrepreneurs in Machakos municipality, it shows that the single women in business between the ages of 18- 37 years were more than the married in the same age group at (98 and 86 respectively). The need for one to be independent, contributes to a desire to starting and running a successful business. Since most of the women who had a business were single in Machakos municipality, this might support the view of the desire of being a boss of one-self as it is reflected by psychological characteristics of an entrepreneur as they are brought out by Gartner 1988 as cited by Diefenbach (2011).

4.5.3: Rate of using Mobile phone for business transaction

Table 19. Age of respondents and mobile use

Age	Most Often	Often	Rarely	Not at All	No Answer	Total
18-27	24	33	13	17	21	108
28-37	19	24	8	7	4	62
38-47	14	26	7	6	9	62
48-57	10	25	6	1	6	48
58-67	3	4	1	1	1	10
68-77	1	1	1	0	0	3
78-87	1	0	0	0	0	1
Non-response						24
Total	72	113	36	32	41	332

Doing the analysis of the frequency of using mobile phone for business transactions, Table 18 reflects the result of age range between 18-37 years (100 out of 332) as the group that was most often and often applied the mobile phone in business. But it was discovered that the same group had the highest number (24) of the participants who did not use mobile application to transact business. In addition, the age range of 38-57 years (76 out 332) was able to apply mobile services in business. Therefore, the result indicates that the majority of the women in all of the groups did not apply mobile technology in business. This supports the findings of Reynolds (2004) who found out that women entrepreneurs were unlikely to adopt technology in business if they were not familiar with its use.

4.5.4: Use of mobile technology to open new markets

Table 20. Age of respondents and opening new markets

Age	Yes	No	Total
18-27	113	12	125
28-37	66	4	70
38-47	60	9	69
48-57	47	7	54
58-67	9	1	10
68-77	3	0	3
78-87	1	0	1
Total	299	33	332

The use of mobile phones in opening new opportunities for business had a fair representation since Table 19 reflects that majority of the women in the age of 18-57 years (318 out of the total of 332) applied the technology. Although the age group of 18-37 seemed to be more in the application (179 out of 332). The young of age were fast in applying the use of the MT in opening new opportunities for business since they are able to learn and understand than the advanced in age.

Therefore, the study affirms the findings of Marcelle (2002), who found out that most of the women entrepreneurs in developing countries with advanced age were not willing to try the risk of the technology since they feared losing in business with new technology. The same studies revealed that the majority of the young women were ready to set up businesses since they were willing to find out what was happening with the Global business industry.

4.5.5: Use of mobile technology for e-banking services

Table 21. Age of respondents and e- banking services

Age	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree	Total
18-27	36	34	37	5	0	112
28-37	13	23	25	3	0	64
38-47	6	18	39	2	0	65
48-57	11	12	24	5	1	53
58-67	2	3	4	1	0	10
68-77	0	1	0	2	0	3
78-87	0	0	1	0	0	1
Non-response						24
Total	68	91	130	18	1	332

The results in table 20 confirm the results of Liu & Mithika (2009), that the usage of e-banking in Kenya and Uganda was prevalent among the young women entrepreneurs. This is also reflected in the findings of this study in Machakos Municipality where the young women were involved in e-banking. In the age of 18-27 years those who agreed strongly were 36 participants and 34 agreed that they are using e-banking compared to the age group of 28-37 since those who strongly agreed were 13 participants and 23 participants agreed that they use the MT in banking. While the rest of the age groups the use of e-banking decreased at the declining rate as shown in table 20.

4.5.6: Mobile technology for improved business performance

Table 22 Age of respondents and business performance

	Strongly agree	Agree	Not sure	Disagree	Strongly disagree	Total
18-27	31	51	12	8	7	109
28-37	23	33	7	2	0	65
38-47	14	40	6	1	0	61
48-57	17	28	5	2	1	53
58-67	5	4	1	0	0	10
68-77	1	0	0	0	0	1
Non-response						33
Total	91	156	31	13	8	332

The study in established that mobile application helped women entrepreneurs to improve their business performance (Table 21). The age groups between 18-47 years had the majority of respondents who agreed that the mobile technology services had strongly improved their business performance. The advanced age groups of between 58-77 years did not show substantial improvement of their business may be because they were not adventurous to try the advanced mobile applications or they lacked information and capability to use these services. The findings concur with the model of Maxwell & Westerfied (2002) which illustrates that technology innovativeness ability works well with young age than with the advanced age.

4.5.7: Correlations of age and monthly income

Table 23. Relationship of age and monthly income before and after adoption of mobile technology

Age range of respondents	Monthly income in shillings before and after adoption of Mobile Technology in business												Total	% Increase after adoption	
	0-20000	20001-40000	40001-60000	60001-80000	80001-100000	Above 100000									
18-27years	42	22	22	35	4	28	3	15	2	13	1	12	114	125	9.6
28-37 years	33	14	9	18	1	17	0	11	1	7	0	3	62	70	12.9
38-47 years	23	12	10	14	1	16	1	14	2	5	0	8	65	69	6.1
48-57 years	22	9	5	13	7	17	1	8	1	5	1	2	53	54	1.9
58-67 years	3	0	2	5	1	2	0	1	1	0	1	2	10	10	0
68-77 years	2	0	1	1	0	1	0	0	0	1	0	0	3	3	0
78-87 years	1	0	0	1	0	0	0	0	0	0	0	0	1	1	0
Total	126	57	49	87	14	81	5	49	7	31	3	27	308	332	30.5

Key: Black: income before adoption, Red: income after adoption, Green: percentage

increase in income due to adoption, blue: total

The study revealed that the mobile technology had a great impact on Machakos county women entrepreneurs since there was overall increase in income by 30.5% due to application of mobile technology as indicated in the Table 22. Still the analysis posits that the young women entrepreneurs between the ages of 18- 37 years were the majority who had adopted the use of mobile technology in business. This can be explained by their ability to understand the new trends in business by use of mobile phone technology services. Motivation theory, as cited by Kirkwood (2009) and Psychological theory by Brockhanus (1982) explains the reasons behind one having a successful business venture, the findings are in agreement with the theories because the young and educated women entrepreneurs in Machakos County were

found to be at the forefront in the adoption of mobile technology in business. The percentage increase in income after the adoption of mobile technology was higher within the young age group as compared with the advanced age group.

4.5.8 Correlations of marital status with mobile adoption variables

4.5.8.1 Rate of Using Mobile Phone in Buying and Selling Products

Table 24. Marital status and rate of using mobile phones

Marital status	Most often	Often	Rarely	Not at All	No Answer	Total
Married	44	69	22	16	21	172
Single	22	35	9	15	18	99
Widowed	5	4	3	1	0	13
Divorced	1	5	2	0	2	10
Non response						38
Total	72	113	36	32	41	332

The study found that 113 married women used the mobile phone in buying and selling products as compared to the single women who were 57 as shown in Table 23. Only 9 of the widowed and 6 of the divorced used mobile phones to buy and sell products. These findings may indicate that the married women consulted their husbands who may be their opinion leaders in business matters. The findings contrast those of the findings in a study cited by Huyer et al (2004) sponsored by the International Development and Research Centre conducted in the fourth quarter of 2004 in West Africa whose findings were that men felt that the new freedom of women to have mobile phones was destabilizing their marital relationship. In many cases men monitored the cell phone and internet use of their spouses. The findings show that spouses have a great role to play in promoting the use of mobile phone technology by women entrepreneurs.

4.5.8.2 Mobile Technology for opening new Markets

Table 25. Marital status and opening new markets

Marital Status	Yes	No	Total
Married	170	20	190
Single	105	10	115
Widowed	13	1	14
Divorced	8	2	10
Non response			3
Total	296	33	332

According to the research findings more married women (170) used the mobile phone to reach new markets compared to the single women (105) who used the mobile phone for the same purpose, as shown in table 24 this shows that spouses were opinion leaders to the women entrepreneurs and the women consulted them for business ventures. These findings were supported by a service provider key informant (K6) who said that sometimes husbands go to seek information from their offices on behalf of their wives. Husbands have a lot of influence on the businesses owned by their wives.

4.5.8.3 Mobile Technology services for e-Banking

Table 26. Marital status and e-Banking

Marital Status	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree	Total
Married	29	44	94	12	0	179
Single	31	41	29	4	0	105
Widowed	6	2	4	2	0	14
Divorced	2	4	3	0	1	10
Non response						24
Total	68	91	130	18	1	332

The study found that few women used the mobile phone to bank their money. Only 73 of those married used their phones for banking purpose while the single women were 72 of those interviewed (Table 25). The total number of all the women who used their mobile phones for banking was 159 out of 308 respondents. This shows that banking service of the mobile phone has not been fully utilized. The findings are supported by the study of Mulwa (2012) on financial inclusion for the unbanked in the rural areas whose findings were that, despite the fact that institutional banks are few in the rural areas; peoples still do not use the mobile phone to bank their money. This might be due to lack of knowledge since the technology of mobile banking is still new. The stake holders need to sensitize and train the peoples about mobile banking.

4.5.8.4 Monthly income after adoption of Mobile Technology

Table 27. Marital status and monthly income

Marital Status	0-20,000	20,001-40,000	40,001-60,000	60,001-80,000	80,001-100,000	Above 100,000	Total
Married	28	49	47	33	17	16	190
Single	22	30	27	15	11	10	115
Widowed	3	5	3	0	2	1	14
Divorced	2	2	4	1	1	0	10
No response							3
Total	55	86	81	49	31	27	332

The study found that there was an upward trend on the monthly income before and after adoption and use of mobile technology services as shown in Table 26 with those married having the highest impact as 49 of those who earned from 0- 20,000 moved to the upper income brackets came down to 28. The single women in the same income bracket who were 30 came down to 22. All marital status showed a positive improvement in their income after adoption and use of mobile technology. These findings are supported by the study done by

United Nations Women Global (2003) which found that women are using the power of mobile phones to unlock economic opportunities with half of the interviewed saying they have used the mobile phone to earn additional income. When harnessed properly the mobile phone can improve the income of the women entrepreneurs.

4.5.8.5 Mobile Technology for improved business performance

Table 28. Marital status and business performance

Marital Status	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree	Total
Married	50	100	18	7	3	178
Single	30	50	11	6	4	101
Widowed	8	4	2	0	0	14
Divorced	4	3	0	0	2	9
Non response						30
Total	92	157	31	13	9	332

From the findings 150 of the married and 80 of the single respondents agreed that the mobile phone had improved their businesses according to Table 27. Out of the 302 interviewed from all marital status, 249 (81%) respondents agreed that the mobile telephone has led to business improvement. The findings are supported by the literature reviewed that in the USA, women enterprises have observed great change in their businesses resulting from the adoption of mobile technology. The main drivers in this trend are, improved business practices, increased competition and performance and new business opportunities (Komunte et al., 2012). The findings were echoed by the Monitoring and Evaluation officer at county offices, who quipped,

K2: Since the women entrepreneurs adopted mobile technology in their businesses, there is a lot of improvement in these businesses. When I compare their performance now and before the adoption, the difference is very large. The ability of the mobile phone to leapfrog the infrastructure barriers has helped women businesses to perform more than we expected.

4.5.9 Relationship of education level with mobile adoption variables

4.5.9.1 Mobile Phone Technology improves performance of business

Table 29. Education Level and business performance

Education Level	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree	Total
Primary	7	25	5	3	1	41
Secondary	35	75	13	8	4	135
Tertiary	10	6	2	0	0	18
Undergraduate	23	21	2	1	3	50
Postgraduate	15	26	6	2	0	49
Non response						39
Total	90	153	28	14	8	332

The findings of the study showed that 142 out of 176 (81%) women entrepreneurs with basic level of education agreed that the mobile phone technology services have improved their business performance as shown in Table 28. Those with advanced education of undergraduate, tertiary and postgraduate who agreed that the mobile phone technology services have increased business performance were 101 out of 117 (86%). This means that education level of the women is not a determinant of the use of the mobile phone technology service since both groups were almost at par.

The findings support the theoretical foundations of this study and especially the TAM model which stipulates that the acceptance of a technology is determined by its perceived usefulness and perceived ease of use. So the perceived usefulness and ease of use of the mobile phone has led to it being accepted and used by the women of different education levels. Among all technologies, the mobile phone is termed as the easiest technology to operate (Kotelnikov, 2007).

4.5.9.2 Mobile technology for e- banking

Table 30. Education level and e-Banking

Education Level	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree	Total
Primary	4	6	26	3	1	40
Secondary	19	42	67	13	0	141
Tertiary	8	8	2	0	0	18
Undergraduate	16	18	14	1	0	49
Postgraduate	18	13	20	0	0	51
Non response						33
Total	65	87	129	17	1	332

The study found that 71 out of 181 (39%) respondents with basic education agreed to use their mobile phone for e-banking while 81 out of 176 (46%) respondents with advanced level of education also agreed to use it for e- banking (Table 29). The findings show that both education levels are below average in their use of mobile phone for banking purposes. This may be due to lack of knowledge of how the service works or due to the fact that the service is relatively new and it is slowly diffusing to the users. The service providers need to train the women entrepreneurs on how to use e-banking service.

4.5.9.3 Mobile Technology for opening new markets

Table 31. Education level and new markets

Education level	Yes	No	Total
Primary	34	10	44
Secondary	136	15	151
Tertiary	19	0	19
Undergraduate	51	4	55
Postgraduate	47	4	51
Non response			12
Total	287	33	332

The findings of the study showed that 170 out of 195 (87%) respondents with basic education agree to use the mobile phone technology services to reach to new markets while those with advanced education were 117 out of 125 (94%) respondents. These results show that the

mobile phone has helped the women from both education levels to reach to new markets. The new markets may be reached through social network services like WhatsApp and Facebook where once one creates an account; he or she can market your products to virtual market hence reaching many people. This means that one is not restricted to the close customers since one can reach customers from other counties and even abroad.

4.5.9.4 Rate of using mobile phone in buying and selling products

Table 32. Education level in buying and selling products

Education level	Most often	Often	Rarely	Not at all	No answer	Total
Primary	9	22	2	3	5	41
Secondary	31	49	23	17	14	134
Tertiary	2	10	1	1	3	17
Undergraduate	14	19	3	5	8	49
Postgraduate	13	11	5	6	10	45
Non response						46
Total	69	111	34	32	40	332

On the frequency of using the mobile phone to buy and sell products, the study found that 111 out of 175 (63%) respondents with basic education used the mobile phone to buy and sell products (Table 31). Those with advanced level of education were 69 out 111 (69%). This shows that both categories of women entrepreneurs averagely used the mobile phone to buy and sell products. So the level of education did not matter for this service of the mobile phone. Stakeholders need to sensitize the women entrepreneurs more in order to know how to use the different mobile phone services for selling and buying products and services.

4.6: Factors that influence the adoption and use of mobile technology services

4.6.1 Benefits of adopting Mobile use in business by women entrepreneurs

Table 33. Benefits of Mobile use in business

Benefits	Strongly Agree		Agree		Not sure		Disagree		Strongly Disagree		Non response	
	F	%	F	%	F	%	F	%	F	%	F	%
Improve the business performance	92	27.7	157	42.7	31	9.3	14	4.2	7	2.1	31	9.3
Savings and accessing loans	52	15.7	82	24.7	28	8	134	40.4	17	5.1	19	5.7
Receiving money and making payments	80	24	175	52.7	16	4.8	36	10.9	9	2.7	16	4.8
Improved World interaction	103	31	163	49.1	30	9	17	5.1	2	0.6	17	5.1
Access Information	122	36.7	166	50	20	6	7	2	4	1.2	13	3.9
communicate with customers	94	28.3	186	56	10	3	16	4.8	9	2.7	17	5.1

On the side of the benefits associated with the use of mobile technology services, the study established that mobile technology services helped improve business performance of the women entrepreneurs (70.4%). This consists of 27.7% who strongly agree and 42.7% who agree. These findings agree with the study by (Kretschmer, 2012) on Information and Communication Technologies and Productivity Growth which found out that mobile technology services have improved businesses in developing countries. The study done by United Nations Women Global (2003), from India to Senegal to Kosovo found that women are using the power of mobile phones to unlock economic opportunities. They perceive the phone as an essential productivity tool. A key informant at the county office supported these findings by saying that many women owned a mobile phone. He added,

K1: We have witnessed a tremendous improvement in women business performance. Women are using technology to sell and buy wares thereby increasing their returns. Nowadays we don't have business women who are unable to pay their county taxes. In fact, some pay in advance which means that they get sufficient revenue.

Responding to use of mobile phones to save and access loans 45.5% disagreed that they access the service through the phones (with comprises of 40.4% strongly disagreeing and 5.1% disagreeing). The findings contrast with the study of (Liu & Mithika, 2009), who did a study on mobile banking in Nairobi and found out that majority of the women were using their mobile phones to do banking services. The findings concur with the interviews with both focus groups because only 5 out of the 12 participants used their phones to save and access loans, which is 42% with the quantitative analysis having 40.4% for the same service.

The study established that 76.7% of the women entrepreneurs used mobile phones to receive money and make payments through Mpesa and Mshwari services. This differs with the study done by (Mulwa, 2012) on financial inclusion for people in rural areas. The study found that the products utilizing the mobile phone technology have not experienced success in uptake and use. The findings were supported by a key informant from Safaricom mobile service, who divulged,

K1: Mpesa and Mshwari services are the main services which the women entrepreneurs use to run their businesses. There is a lot of sending and receiving money using Mpesa. It has changed the way of doing business for most entrepreneurs.

The study found that women entrepreneurs used the mobile phone to access business information (86.7%). This information agrees with the study of (Mutwiri, 2012) which was conducted in Machakos county using mobile technology in farming whose findings were that farmers who were using mobile phones in getting information really benefitted.

Respondents in the study (84.3%) agreed that they use mobile phones to communicate with their customers in doing business. This shows that mobile technology has great impact in doing business since majority of the customers have mobile phones as reflected in the study. For any woman entrepreneur to succeed in business, therefore, one needs to own and use a mobile phone as it is reflected in the modern business industry. The current study finds itself in agreement with the literature reviewed by (Hanz, 2009) which posits that any business in the current century that does not embrace the mobile technology is bound to fail. A study that was carried out in India by Malhotra, et al. (2002) revealed that women entrepreneurs (95%) had adopted the mobile technology in day-to-day running activities of their businesses.

These findings were in agreement with the focus groups discussion participants who agreed that they use the mobile phones to communicate with their customers. One of the participants said,

F6: I spend most time talking to my customers through my mobile phone. In fact I have not met some of them physically but we communicate regularly. I can either call them or text. My mobile phone does the walking for me because I can reach all of them in the comfort of my premises and even from my house.

When well harnessed, the mobile phone can improve businesses run by women. One can reach out to customers and even new markets and thereby improving the performance of their businesses.

4.6.2. Factors determining mobile phone technology adoption

Table 34. Factors determining Mobile adoption

Factors	Strongly Agree		Agree		Not sure		Disagree		Strongly Disagree		Non response	
	F	%	F	%	F	%	F	%	F	%	F	%
Time saving in service delivery	42	12.6	108	67	7	2.1	2	0.6	0	0	173	52.1
Promotion of e-banking and e-marketing	68	20.5	91	27.4	130	39	18	5.4	1	0.3	24	7.2
Services of mobile technology are easy to use	87	26.2	185	56	24	7	11	3.3	2	0.6	23	6.9
Expensive in using the technology	35	10.5	104	31	72	22	89	27	14	4.2	18	1.3
Lack of knowledge on mobile technology	33	10	106	32	115	34	50	15	12	4	16	5

The current study revealed that time saving (79.6%) which consists of 12.6 % who strongly agree and 67% who agree, and ease of use of mobile services (82.2%) influenced greatly the use of mobile technology in business consisting of those who strongly agree (26.2%) and those who agree (56%). Literature reviewed established that time saving in service delivery, use of e-banking and e-marketing, knowledge about mobile business and various services easily accessed through mobile technology were the main reasons for the adoption and use of mobile technology. The findings contrast with the study by Gathuki (2011) whose findings where that time saving, was the main factor that influenced adoption and use of mobile technology by women entrepreneurs in Machakos County.

The findings also contradict the results from the focus groups, who said that some of the services of the mobile phone were not easy to use. From a total of 12 participants, only 3 had accessed internet on their phones. The rest said they had not accessed it because they could not understand how to go about it. One commented,

F5: There are so many services in my phone which I don't know how to use. I don't even know how to use Mshwari. Even accessing internet is a problem to me. In fact, I took so long to understand how to use Mpesa. I only used to call and text because those are easy to use.

The mobile phone has so many services and if women entrepreneurs can harness all of them in their businesses, they would save a lot of money and time and their businesses would grow because they would earn more profit.

Concerning mobile technology services to promote e-banking and e-marketing 47.9% of the respondents agreed that the technology assisted in promoting e-marketing and e-banking. This concurs with the study done by (Sylla, 2000) in Senegal on rural women farmers. The study found that the rural women found the mobile phone appropriate because they could select the most interesting markets at which to sell and buy the products they needed.

On cost, (41.5%) respondents said that mobile phone technology services were expensive to use while 31.5% said that they were not. These findings agree with literature reviewed by (Hanz, 2009) who postulates that the cost associated with using the services of a mobile phone is so high to the extent that it increases the overhead costs which is quite damaging to business. The chairlady of a women group contradicted the findings and said,

K3: The use of the mobile phone has become cheap nowadays, because of the competition from the different service providers, calling cards have become cheap and calling time is more.

The respondents (42%) stated that they lacked the knowledge to use mobile technology services while 15% disagreed. This might be the reason why the women entrepreneurs have not adopted the advance mobile phone applications. The findings agree with the Technology Acceptance Model which postulates that people will not adopt technology which is not easy to use

4.6.3. Support services for the adoption and use of mobile technology in business

Table 35. Support service for mobile use in business

Support services	Yes		No		No answer		non response		Total
	F	%	F	%	F	%	F	%	
Opening of new markets	238	72	33	10	27	8	34	10	332
Enhancement of business	239	72	31	9	37	11	25	8	332
Provision of immediate feedback	251	76	36	11	22	7	23	7	332
Availability of internet services	225	68	62	19	19	6	26	8	332
Strength of internet signal	110	33	68	21	109	33	45	14	332
Capability of women in using mobile technology	238	72	20	6	59	18	15	5	332
Effects of regulatory issues in adoption and use of mobile technology	120	36	148	45	43	13	21	6	332

It was established from the study that most of the factors that were encouraging women entrepreneurs in Machakos county to use mobile technology services in business included; the need for immediate business transaction feedback (76%), the desire to reach new markets

(72%), the ability to enhance the business growth (72%), the ability and affordability of the mobile phones (72%) and availability of internet connectivity in the area were the major reasons which influenced the adoption of MT. The secretary of the women group supported the findings by saying,

K4: The mobile phone gives me instant feedback especially when I want to get urgent information from my customers and am able to reach new markets globally. For example, since I sell clothes, I can call my customers when am buying clothes in Turkey and ask them their sizes and preferred colors and I get the information instantly, so I purchase what they want.

However, the study also discovered that the regulations from the government and service providers and also the poor internet signal (36%) discouraged the use of mobile phone technology services in Machakos County. The study concurs with the study of Donner & Escobari (2010) who conducted a study on mobile use by micro and small enterprises in developing countries and found out that the regulations that were put in place and lack of facilities hindered the faster development of mobile technology in business in most of the developing countries.

These findings contrast with the information from a key informant in the ministry of ICT (K8) who said that the government has put favorable technology regulatory policies for the small and medium enterprises (SMEs) in order to encourage and promote their growth.

4.6.4. Effects of power supply on the usage of Mobile phones in Business

Table 36. Power supply effects

Response	Frequency	Percentages
Quite often	38	11.5
Often	121	36.4
Not often	120	36.1
Never	36	10.8
No answer	17	5.2
Total	332	100.0

The study found that the power supply is a factor that influenced adoption and use of mobile technology services by women entrepreneurs in Machakos County (47.9%) which consist of 11.5% quite often and 36.4% often. This concurs with the study done by Strategic Growth Concepts (2013) on mobile technology and productivity which found that power supply is a major factor which determines the adoption of mobile technology. The findings also support the findings of the two focus groups discussions where members said that power supply was a factor that influenced the use of their mobile phones. Most mobile phones need to be charged regularly and due to constant power cuts, and the mobile phones cannot work without a powered battery, it affects the phones usage.

The chairlady of the women group said,

K3: Power supply is an issue here; we have constant power interruptions which make it impossible to use mobile phones and especially smart phones which have to be charged daily. It is very frustrating when your clients cannot reach you and you cannot reach them because your phone is off due to lack of power. In fact those who can afford have bought generators and other power back-up systems to be able to charge their phones once there power interruption and especially rainy season when interruptions are more.

Chew (2011) recommends that solar panels can be substituted with electricity to charge mobile phones. This will make it possible for the women entrepreneurs to have charged mobile phones always and thereby be able to reach out to their customers any time.

4.6.5. Sales turnover before and after use of mobile technology in business

Table 37. Sales summary before and after adoption of mobile technology

Sale Turnover in Kshs.	Before the adoption of mobile technology		After the adoption of mobile technology	
	Frequency	%	Frequency	%
0-20,000	126	37.9	19	5.7
20,001-40,000	49	14.8	70	21.1
40,001-60,000	14	4.2	65	19.6
60,001-80,000	5	1.5	21	6.3
80,001-100,000	7	2.1	14	4.2
Above 100,000	3	0.9	15	4.5
No answer	128	38.6	128	38.6
Total	332	100	332	100

In comparison with the sales turnover, the study exposed a positive upward growth of sales turnover (Table 36). Starting with (Kshs. 0 – 20,000) in the first month before adoption (40%) and after adoption the sales increased and the people who remained in this bracket dropped to 6% from 40%. The trend continued positively but the sales turnover of (Kshs. 20,001 – 40,000) and (Kshs. 40,001- 60,000) benefitted greatly from the adoption of MTS.

The study concurs with the literature on adoption of mobile technology by women entrepreneurs, particularly a study done by Cherie Blaire Foundation for Women (2012) which revealed that mobile technology services added value for business growth for women entrepreneurship enterprises.

The findings support the information given by the key informant in the county offices. The monitoring and evaluation officially revealed that women entrepreneurs who have adopted mobile technology in their businesses had an increased income which enabled them to open

other business branches or diversify in business. The service providers' key informants (K5 and K6) concurred with this information and said that money movement among the women entrepreneurs both by Mpesa and Airtel money had increased. All focus groups participants agreed with these findings by saying that their monthly income had increased. These findings show that when mobile technology is adopted in entrepreneurship, it leads to business growth through more profits.

4.6.6. Performance of Business before Application of Mobile Technology

Table 38. Performance of business without mobile technology

Response	Frequency	Percentages
Poorly	252	75.9
No difference	19	5.7
Better	7	2.1
No answer	54	16.3
Total	332	100.0

The study found that most businesses performed poorly (75.9%) without adoption and use of mobile technology services (Table 37). This supports the study conducted by FinMark Trust, (2008) who found out that in sub Saharan Africa businesses were performing poorly because of inadequate use of mobile technology services as compared to developed world where most of the women had incorporated technology in their businesses and were performing above average.

A key informant from the ministry of ICT (K7) concurred with these findings and said that before entrepreneurs adopted mobile technology services in their businesses, most of them were performing very poorly because they didn't have information on business and markets, and most closed down soon after opening and after investing much capital. All participants in

the focus groups stated that their businesses were performing poorly before adopting mobile technology but they have seen tremendous positive change after adopting mobile technology services.

4.7. Role of Communication and Information Flow in Adoption and Use of Mobile

Technology Services

4.7.1. Information about use of mobile phones in business

Table 39. Information about use of mobile phones in business

Channel	Frequency	Percentages
Interpersonal	150	45.2
Policy makers	12	3.6
Media	51	15.4
Service provider	105	31.6
No service	12	3.6
No answer	2	0.6
Total	332	100.0

The study established that most women entrepreneurs got the information about mobile technology services through face to face communication (45.2%) and the mobile service providers (31.6%). The media was found to have also played a role in the information dissemination but not to a great extent (15.4%). This result was not in line with the study conducted by Komunte, Rwashana, & Nabukenya (2012), who posit that, information flow by media had more influence in the adoption of the mobile technology by most women entrepreneurs in Uganda and Kenya. This might be because most of the women in Machakos County may not be using the media as the source of information in business.

The findings concur with the focus groups participants who all agreed that they get most of the information about mobile use through talking with their colleagues, friends and

customers and during their informal meetings. Though they said they occasionally called or visited the service provider offices to get information on mobile technology use. One participant commended,

F7: When I want to know how to use any mobile service, I ask my friends because they explain to me slowly and in a language I understand. For example, when I wanted to know how to use internet in my phone, I went to my friend who helped me. It is easier and time saving than to go queue in the office of the service provider.

Opinion leaders play a great role in influencing information diffusion. The women entrepreneurs prefer getting information from those they know than from other media and that is why interpersonal communication has the greatest percent.

4.7.2. Campaigning agents for mobile technology adoption

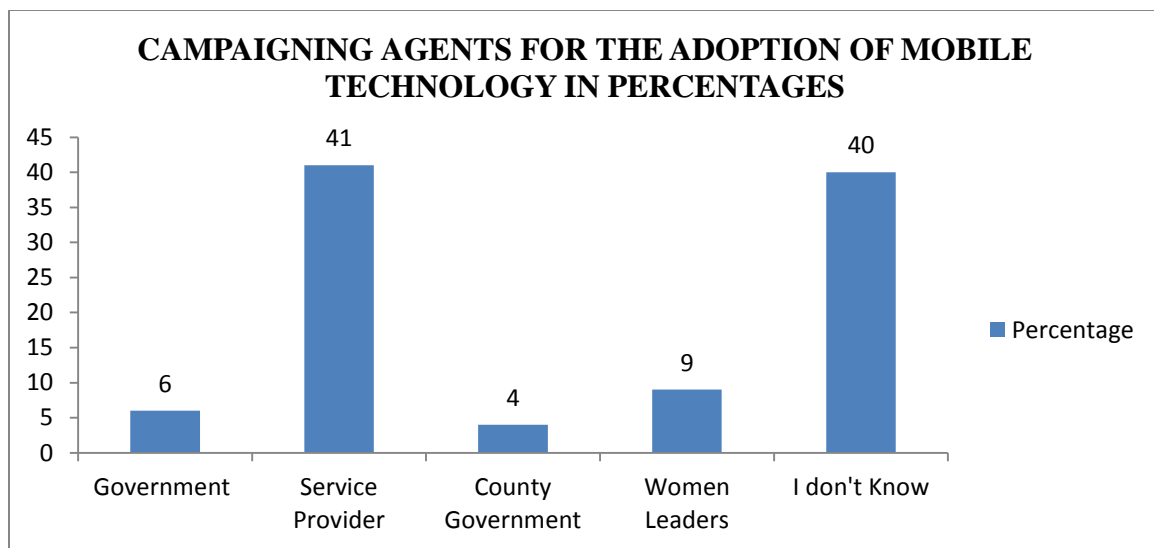


Figure 4: Agents of mobile technology campaigns

This question sought to understand who were strongly campaigning for the adoption and use of mobile technology in Machakos County. The women entrepreneurs acknowledged that service providers from mobile phone companies mostly Safaricom were the main source of information in adopting the new technology in business (41%) but it was wanting that most

of the women (40%) were not aware about the campaigns of the use of mobile technology. The study confirms the findings of Liu & Mithika (2009) who conducted a study in Nairobi about the use of mobile banking by women and found out that the service providers since they are in business were the most people who were campaigning for their product use.

A key informant from one service provider (K6) informed the researcher that they have monthly service campaigns whereby they hire a promotion company to go around the county promoting their products and services and offer free gifts like T-shirts, caps and mobile phones to the public to encourage attendance. A key informant from the ministry of ICT concurred with the findings and said that the low percentage of the campaigns by the government is due to the fact that the ministry is relatively new and they are still implementing the new policies.

4.7.3. Role of various stakeholders in training women entrepreneurs on adoption of mobile technology

Table 40. Stakeholders role in training women entrepreneurs in mobile phone technology

Stakeholders	Yes		No		No answer		non response	
	F	%	F	%	F	%	F	%
Education by County government	20	6	111	33	28	8	173	52
Clients and colleagues	168	51	74	22	56	17	34	10
Radio & TV	216	65	57	17	30	9	29	9

Investigating on the role played by some sectors in promoting the use of MTS in business in Machakos County, it was discovered that Radio and TV, clients and colleagues took the major role in promoting the use of MTS (65%) & (51%) respectively. It was discouraging

that the county government was not doing enough in encouraging the women to apply the use of MTS in business as the new change in business is taking place in most parts of the world. A county official key informant said this may be a result of poor attendance of trainings by the women entrepreneurs. He quipped,

K2: We are not able to facilitate much training because the county government is not able to meet the expenses of the trainings due to lack of finances. So we only hold one training yearly but still many of the entrepreneurs in the county do not attend.

4.7.4. Medium of information about e-business

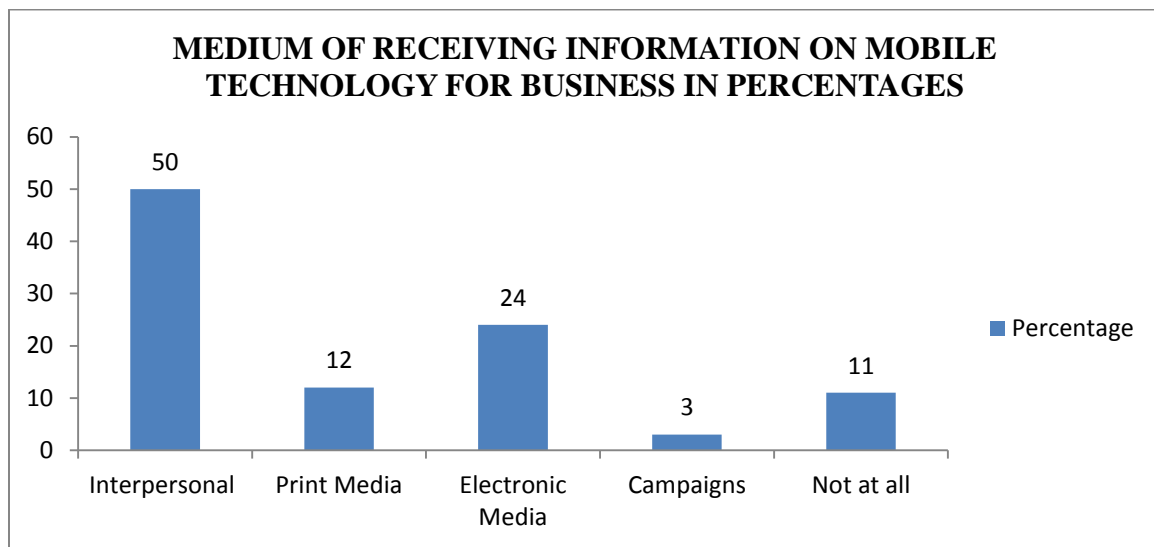


Figure 5: Medium of e-business for women entrepreneurs

It is clear from the study that the medium through which the information flows to the women entrepreneurs in Machakos County about the use of MTS in business is majorly the interpersonal communication (50%) this might be because of sharing of information by women who are in business with their colleagues. The electronic media (24%) and print media (12%) have also a role to play in the adoption of the MT in business. Accessibility of the information is vital in any business and therefore, for the development of business in Machakos, it is necessary for the county government to be involved in the business

campaigns on the use of MTS. The focus groups discussion members agreed with the findings of the study and added that they get information when they have their monthly meetings. One of them quipped,

F4: I get all the information I need during our monthly *chama* meetings. In every meeting we share all information about our businesses. It's the best way of getting information because we contextualize it to our situations.

Since interpersonal communication seems to be the most preferred media of receiving and sharing information, the county government should train and pass relevant information to the opinion leaders such as the women group leaders, youth group leader and other informal leaders who would pass it to the women entrepreneurs to encourage them to adopt and use mobile phone technology services.

4.7.5. Type of mobile technology used by women entrepreneurs

Table 41. Services accessed through mobile technology

Application	Frequency	Percentages
Voice communication	178	53.6
Internet	58	17.5
SMS	70	21.1
E-banking	13	3.9
No answer	13	3.9
Total	332	100.0

To understand which service was commonly accessed by the women entrepreneurs in Machakos County over the MTS, the study exposed that voice communication (53.6%), Sms (21.1%) and internet services (17.5%) were the main products the women entrepreneurs used (Table 40). This means the services such as e-banking (4%) were rarely used. These findings concur with the study by Furuholt and Matatoya (2011) that investigated the levels of mobile phone use among entrepreneurs in Tanzania and found that they only used the basic level of

mobile phone mainly to communicate with family and friends as well as business partners. This is corroborated by Ramburn and Van Belle (2011) who showed that even in Mauritius, which has one of the most sophisticated cellular markets in Africa, advanced mobile data services (apart from SMS) has not entered the lives of most of the subscribers.

The study findings agree with the study by (Mutwiri, 2012) on the use of mobile phone by the rural farmers to get agricultural information whose findings were that people use the call and SMS services more than any other service to pass information. All participants in the focus groups discussions concurred with the findings;

Q: Which service in your phone do you use mostly?

F5: Voice calling, followed by SMS

Q: Do you ever use the rest?

F5: No I have never used them.

Q: Why?

F8: We don't understand how to use them; I don't understand the steps for registering any of them and especially OLX and Whatsapp.

F6: The services are so many such that they are confusing, before you even learn how to use one, they introduce another one, and they don't even give us time to learn.

One participant said,

F12: I prefer calling my clients than even texting them since calling saves time and gives me immediate feedback. I don't use my phone for e-banking since I don't understand how it is done.

The stakeholders need to sensitize and train the women running enterprises on mobile phone technology services like e-banking and internet which are important for business growth. For effective adoption of MTS in business these services need more campaigns so that the women can be able to benefit from the application of MTS in business. In the USA women entrepreneurs have observed great transformation in their businesses after being sensitized and trained to adopting and using mobile technology service (OECD, 2011).

4.7.6: The role of electronic media on information dissemination about mobile technology adoption and use

Table 42. Electronic media role on mobile application in business

Roles	Frequency	Percentages
Advertising	222	66.9
Programmes	59	17.8
Demonstrations	12	3.6
Campaigns	15	4.5
Not at all	24	7.2
Total	332	100.0

The role played by the TV/Radio was established to be advertising (66.9%) and programme training (17.8%) in promoting the use of MTS in business application. The analysis conducted by Chew, Ilavarasan, & Levy, (2013) on economic impact of mobile phones and entrepreneurial motivation on female-owned microenterprises revealed that there still many women who are yet to integrate the MTS advanced applications in business. The study recommended that the media should be used by the service providers to encourage the women entrepreneurs to adopt the advanced functions of the mobile phone technology so that they can benefit from the global business development. Both of the key informants from the service providers (K5 & K6) agreed with the findings and said that their firms have invested a lot of money in advertising for their services in both electronic and print media to keep up with competitors from other service providers.

Demonstrations were rarely used by the electronic media to disseminate information at 3.6% and this paints a grim picture on the adoption process since it is an important way of training the women entrepreneurs to adopt MTS. Demonstrations should be emphasized. The women entrepreneurs would follow the steps and learn how to use the advanced mobile phone applications.

4.7.7. Use of mobile technology by women entrepreneurs for running business

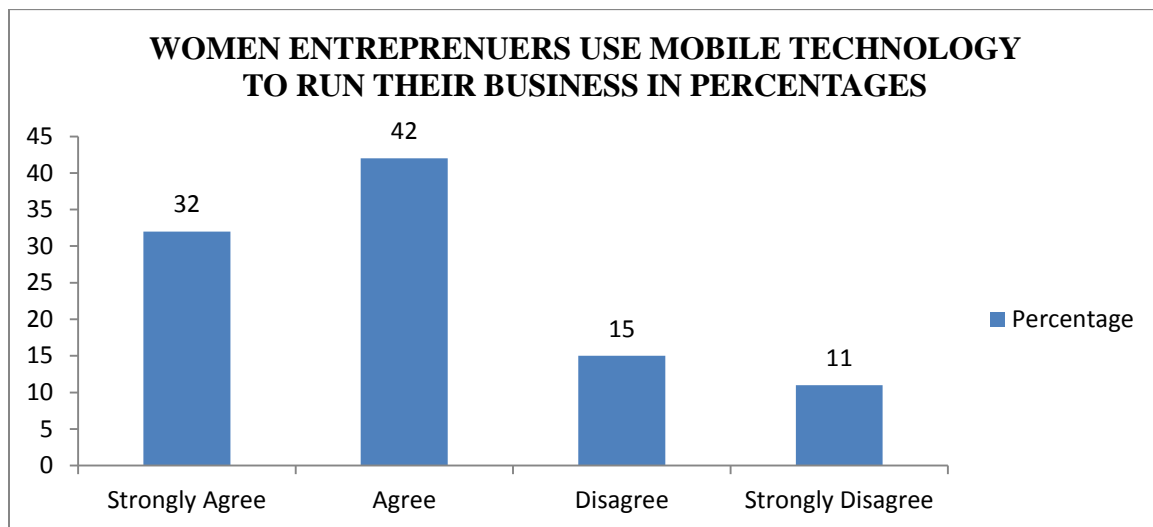


Figure 6. Use of mobile technology by women entrepreneurs

The findings of the study advanced that women entrepreneurs in Machakos County had adopted the MTS in business as shown in (32%) of the participants strongly agreed while (42%) agreed to have adopted the technology for running their businesses. This might be because of the influence of the media and the campaigns that are carried out in the area by the mobile service providers as it was observed by the researcher, although most of the women entrepreneurs reported that interpersonal communication had a great influence in the adoption process.

Participants in the focus group discussions concurred with the findings of the study by saying that they use the mobile phone quite regularly to transact business. Two key informants who were women leaders (K3 & K4) supported the findings and said that women in their groups were using mobile technology services albeit the basic functions of the mobile phone in their businesses. The findings show that women have accepted the mobile phone as an indispensable tool for doing business.

4.7.8. Women empowerment through use of mobile technology in their business

Table 43. Women empowerment through use of technology

Benefits	Frequency	Percentages
Increase in income	105	31.6
Business growth	90	27.1
Development of skills	77	23.2
Better services	32	9.6
Reduction in business	16	4.8
No answer	12	3.7
Total	332	100.0

There is adoption of the MTS in business in Machakos County, although only the basic functions have been greatly adopted, its impact has been felt by the women who have integrated the technology in business. From the study 23.2% of the women entrepreneurs agreed that they have managed to acquire new business skills by using their mobile phones in business. 27.1% indicated that they have managed to grow the business to higher levels even opening new branches in other areas while 31.6% believed through MTS they have managed to increase their sales revenue and 4.8% acknowledged that the use of MTS in business has led to reduction in business compared to the previous trends in the county.

The World Bank (2012) in their study on information and communications for development by maximizing mobile technology suggest that the adoption of the technology in business assisted the majority of the business women in the Southern America region to gain new skills thus reducing the business failure and increasing their service delivery at 75%.

The focus groups discussion participants supported the findings by saying that MTS has helped them gain new business skills. They can now sell and buy goods through the mobile phone and even pay their utility bills through the phone. A key informant from the county office (K2) agreed with the findings and said that there is a lot of business growth in the county and increased revenue collected from the entrepreneurs.

Table 44. Communication services and empowerment of women entrepreneurs

Communication services	Strongly Agree		Agree		Disagree		Strongly Disagree		Non response	
	F	%	F	%	F	%	F	%	F	%
Customers and suppliers lack information on mobile technology	43	13	81	24	175	53	12	4	21	6
Use of banners, posters and fliers has made it easy to adoption	78	24	184	55	48	14	3	1	19	6
Interpersonal communication has assisted in adoption	81	24	186	56	34	10	3	1	28	8
Newspapers and magazines helped in adoption	59	18	138	42	104	31	6	2	25	7

While investigating on the services that are available to women entrepreneurs and which had influence on the use of MTS, interpersonal communication (80%) was found to have greatly influenced the women, consisting of 24% who strongly agreed and 55% who agreed, while use of banners, posters and fliers also supported the adoption of MTS at (79%) and

Newspapers and magazines at (60%). This indicated that most of the women entrepreneurs relied on the available services to learn how to apply the MTS in business.

The findings also showed that suppliers and customers had information about MTS application in business (37%) although it was below average. Therefore, it will be of great importance if the women were encouraged to integrate the more advanced functions of the mobile phone in their businesses so that they can benefit from the great opportunity that is available in the industry.

Table 45. Frequency of conducting campaigns and trainings for mobile technology adoption in business

Responses	F	%
Most often	26	7.8
Quite often	56	16.9
Often	20	6
Not often	21	6.3
Non response	209	63
Total	332	100.0

It was established that the frequency of conducting campaigns and trainings were at 30.7%. While 6.3% said it was not done often while 63% of the respondents did not respond. This might be because there is lack of proper channels of communication to pass information about the trainings. Lack of response to this question might have been because most of the participants are not aware that they should be trained in the adoption of information technology as the government is emphasizing on the use of information technology in every sector of the country and has mandated the ministry of ICT to train entrepreneurs to incorporate technology in their businesses.

The findings were supported by the women group leaders (K3 & K4), who said that campaigns and trainings to sensitize women entrepreneurs on MTS were not done regularly and that might be the reason why majority of the respondents (63%) did not respond. The few which were done were mostly conducted by the service providers and especially Safaricom service providers to market their services. One of them said the government was using a wrong medium to pass information about the trainings so most of the women entrepreneurs did not get to about the trainings.

Table 46. Use of different media in business

Media used	Yes		No		No answer		No response		Total
	F	%	F	%	F	%	F	%	
Emails	73	22	205	62	34	10	20	6	332
Letters and memos	50	15	244	74	14	4	16	5	332
Newspapers and magazines	91	27	207	62	18	5	16	5	332
TV/Radio	68	20	232	70	19	6	13	4	332

On the medium the women entrepreneurs used for communication in business, the study discovered that women entrepreneurs in Machakos County were using Newspapers (27%), Emails (22%) and also Radio/TV (20%). These findings show that other media use was also below average. This is an indication that interpersonal communication was the major medium used to pass and get information (as shown in figure 5). The use of modern technology seems to be very low in developing countries compared to developed countries as the literature indicated (Afrobarometer, 2014). Many women businesses are still missing the huge potential benefits of using the advanced functions of the mobile phone as part of their business enhancement (Ilavarasan& Levy, 2012). The different modes of communication embedded in most mobile phones including voice, SMS, radio, TV, internet, interpersonal

and group communications don't seem to improve the situation (AFFRI, 2009). This has resulted to some of them despite, being in the market for long, being overtaken if not edged out of the business by those that utilize mobile telephony because they are unable to use all the functions of the mobile phone (Svanaes, et al, 2010).

The findings concur with the information from the focus group discussions who informed the researcher that they rarely use other media to pass information. These findings show that women entrepreneurs in Machakos County use minimally other media of communication in their business and also only use the basic applications of the mobile phone in their businesses. This means that they are missing out on the potential of the mobile phone in their businesses.

4.7.9. Frequency of social media use in business by women entrepreneurs

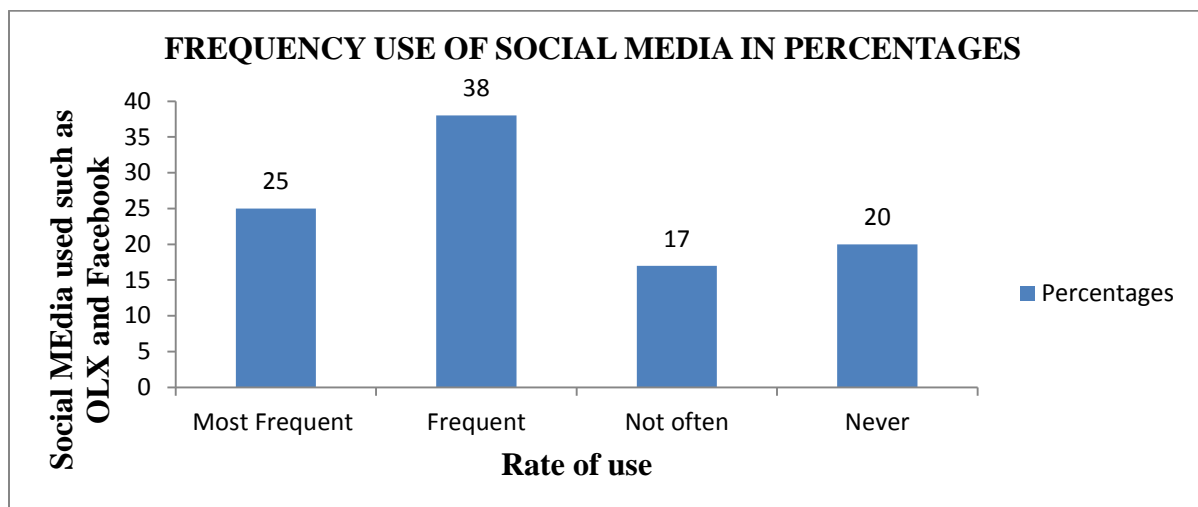


Figure 7: Frequency of social media use in business

The social media is one of the current platforms for conducting business which the women entrepreneurs need to take advantage of. But the study exposed that this platform still needs

to be exploited, since only 25% of the participants confirmed to be using the medium most frequently with 38% using it frequently. 17% of the participants established that they have never used the medium. To be able to exploit the advantages of the social media there is a need to sensitize the women entrepreneurs in Machakos County about the opportunities available in the social media and train them on how to use the different social media applications in order to get the benefits of using them in their businesses.

This study is in line with Macoy & Smith (2007) who found out that social media applications connect communities and transform communications, enhance overall well-being and open up trade. Social media has become very popular in both developed and developing countries and this presents a huge market for women entrepreneurs.

These findings were supported by a key informant from Airtel service provider, who acknowledged,

K6: Women entrepreneurs have not fully embraced social media as a service which they can use in their businesses to sell and buy products. They perceive social media as one for leisure but not for business. Only a few inquire from us about the social media service.

Women need to be sensitized to exploit social media service in their phones since many people have subscribed to social media. Hence they can get a wide market area for their goods and services through the social media which would increase their profits leading to business growth and hence empowerment.

4.7.10. Services provided by social media to women entrepreneurs

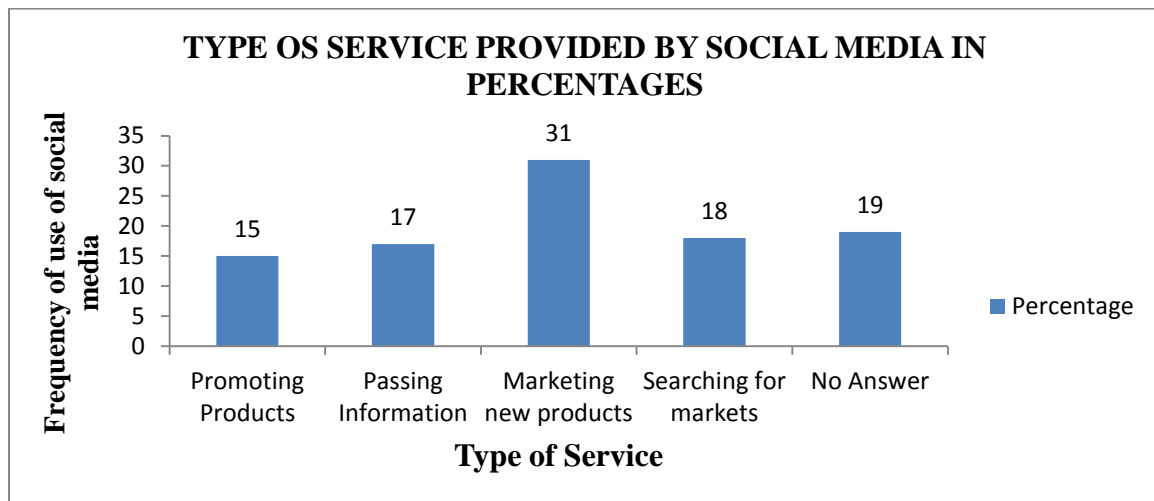


Figure 8. Services provided by social media

The social media has offered opportunities to many business people in the world. The services provided by the social media which the women have made use of are; marketing of new products (31%) which is the service mostly used by the women entrepreneurs. Other services had percentages below 20% which were promoting products (15%), passing information (17%) and searching for new markets (18%). From the study it is true that the women entrepreneurs in Machakos County have not fully exploited the use of the social media to their advantage.

The findings were in agreement with (Hafkin, 2003 and Hanz, 2009) who found out that most women entrepreneurs in Africa have not benefited from the use of social media for business. This may be because they have not been trained on how to exploit the service for their advantage. The findings also agreed with the information given by most of the participants of the focus groups discussions who informed the researcher that they rarely

used social media in their businesses. Only 4 participants in the focus group discussions out of the 12 use social media to market their products.

4.8. Discussion of the findings

Most of the studies that have been conducted so far on mobile phone technology services in the informal sector and especially on women do not demographically segment the women entrepreneurs to understand their adoption patterns. The study found that demographic factors such as, age, education level and marriage status contributed to the adoption rate of mobile phone technology services by women. The studies focus mainly on one mobile application in business rather than the different mobile applications which are all important for business transactions. The few theoretical aspects available on the usage of mobile phone technology services in the informal sector in Kenya do not give clear representation of the state of mobile use in business. In this study, the mobile phone was found to be a key communication tool used by women entrepreneurs in Machakos county to conduct their businesses.

The study found that women had not adopted mobile technology services fully because they lacked information and the knowledge of how to use the advanced applications. The service providers do not include communication component in the row out plan of a new application and this has resulted into minimal adoption of the services. If women had enough information about the technology, they would adopt it fully. This is evident in Table 31, women who had basic education adopted faster than the ones with advanced education

because they relied on their opinion leaders and business colleagues to get information on mobile phone use or their women group leaders, during their informal meetings.

Through the focus group discussions, it was found that mobile phone was being used to support business, relations to friends and family relations. These findings concur with that of a study done by Donner (2005) in Kigali Rwanda, where he found that mobile phone call logs revealed that two thirds of calls were to family and friends. The current study investigated only women entrepreneurs and found out that the majority used mobile phones for business purposes and connecting to their friends although they did not use the mobile phones to their full potential (Table 9 and Table 33). Both mobile phone voice calls and SMS were the services mostly used by the women running business enterprises. The bulk usage of SMS by women entrepreneurs, strengthen the argument that there is increased usage of Mobile Money by actors in the value chain.

SMS was seen by women entrepreneurs as a convenient means for communicating detailed information. Examples include, money transfers by Mobile Money, selling and buying of goods, requests of commodities from stores among others. Hence, the usage of SMS can be considered as a means for coordinating internal business processes among women entrepreneurs. From the study, it was found that the mobile phone cannot replace face to face communication since as much as they had the mobile phones, women entrepreneurs still met regularly to deliberate on issues concerning their businesses and their informal groups.

The findings from the focus group discussions revealed that the use of mobile phones facilitated women running enterprises in coordinating of their business activities. The mobile

phone was found out to be a tool widely used to coordinate business processes anywhere and anytime. But the mobile phone was not being used by women entrepreneurs to check out commodity prices in various markets, and accessing timely information about business transactions as it was sought in the study (Table 35).

The mobile phone empowered women entrepreneurs with knowledge to carry out business transactions. The mobile phone was found to empower women in Kenya. Mobile phone investment by women entrepreneurs itself was payoff. It increased revenues of women entrepreneurs as shown (Table 23 & 27). This was because benefits like increased exposure and broadened networks are necessary conditions for positive social and economic change.

It is clear from the study that, mobile phone was and continues to be seen as a knowledge tool to clear the digital war. More so, the solution is not just a matter of purchasing mobile phones with dual simcards, but ensuring that sustainable pricing regulations and policies are put in place, so that women in business can benefit from the mobile phone services and in turn boosts their economic welfare. The high costs of using cell phones for day-to-day business and family/community-related issues was a major concern for most of the women in the focus group discussion and they also noted that most of them have not been sensitized enough to use the tool hence leading to frustration (Table 39, 40 & Figure 4).

Furthermore, with the increased phone space, significant concerns were expressed on the denial of this space within spousal relations where- in some instances spouses sought to find out the contents of some of the communications conducted on the phone. Some of the women

felt that there is a conditional benefit of this space due to the interruption on their privacy
(Focus group discussions)

The study found out that women had no ability to make comprehensive use of the cell phone technology as well as of the information and knowledge it provides. For example, most of the women mentioned using the most basic functions and services on their cell phones. If they wanted to explore other functions they depended on their family members or business colleagues for training. Most of the women interviewed had used the phone for calling and SMS. Only a few who had used other services such as WhatsApp, Facebook, LinkedIn and internet among others (Tables 40 & Figure 7)

Across Africa, Asia and Latin America, mobile phones have enabled more than two billion people to become more productive and efficient, but there is growing anecdotal evidence to suggest that women in these regions are not benefitting as much as men(Wakunuma,2008). To better understand the extent of the gender gap in mobile usage and why it has occurred, the Global System for Mobile Communication Association (GSMA) Development Fund joined forces with the Cherie Blair Foundation for Women, and concluded that people at the base of the economic pyramid need to be empowered and positioned for employment and build enterprises that will enable them to eventually escape poverty. Among the most important tool to be used to achieve this goal was the mobile phone.

4.9 Contribution of the study

i. Contribution to Literature

Although this study draws on extensive literature and studies done on mobile technology and women entrepreneurs, not much has been done on empowerment of women entrepreneurs through mobile phone services and especially in Kenya. Most of the literature was drawn from other countries some of which are in different development level than Kenya. This study was motivated by the fact that despite the availability of mobile phone services in Kenya with a penetration where 80% of its population have access, women running business enterprises were not using its applications to maximize profits. This study found the missing link to be lack of communication context in the implementation, adoption and monitoring and evaluation stages. Therefore, this study contributes to the existing literature by including the aspect of communication to be entwined in any technological diffusion.

ii. Contribution to Knowledge

Most studies focusing on the adoption and use of mobile phone services are from the USA and few in Europe which have a more established internet infrastructure. This is one of the few studies coming from Africa investigating adoption and use of mobile phone services by women entrepreneurs for empowerment. It therefore forms a basis for comparison with results from other studies done elsewhere.

The study established a link between adoption and use of an innovation, and communication and information flow. Any innovation being rowed out for adoption should include elements of communication since it's a major determinant of acceptance and continual use of an innovation. Due to lack of information on mobile phone services, adoption of mobile

technology services is not adequate at the basic level leading to little or no adoption for the advanced services of the mobile phone. A wide range of knowledge on the use of mobile phones for business is crucial and this thesis adds to that knowledge.

The study established a new conceptual framework which guides mobile phone service providers, women entrepreneurs and other stake holders on the path to take to achieve women economic empowerment.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter provides a summary of the study findings, with supporting postulates from literature and making inferences relevant to the research relationships studied, searching for the broader meaning of the research findings as well as relating the findings to the literature reviewed and the research questions of the study and drawing conclusions about the relationships.

5.1 Summary of key findings

5.1.1 Demographic Factors of women entrepreneurs in Machakos County

The study established that the young women between 18-37 years were more in entrepreneurship than those with advanced age as shown in Table 5. This might be caused by the desire to be independent. It might be because white collar jobs vacancies are very competitive and those with advanced age who may have more experience and skills end up getting those jobs. So the young women between 18-37 years have no option, than to turn to self-employment after finishing or dropping out of school. It might also be as a result of psychological characteristics that determine an entrepreneur as explained by Brockhanus (1982) that state that the ability for one to be a vibrant business person works well with young age and decreases as one advance in age.

The study also established that 57.2% of the women who are in entrepreneurship are the married ones as shown in Table 6. This contrast with other studies conducted among women entrepreneurs (Macoy& Smith, 2007; Athanne, (2011) &Haynes, (2011)) whose

results portrayed that majority of the women in business were either single, divorced or widowed as they are pushed in business because of the condition they find themselves in economically as they have no spouse to support them. The findings of this study are supported by the study done by Imbaya (2004) in Eldoret whose findings were that for most women (66.8%) the decision to go into business was determined by other people than themselves including husbands hence the large number of married women in business. This means that spouses have an important part to play in the adoption and use of mobile technology services by women entrepreneurs as the women will turn to them for business advice.

Other studies done had found that women who had higher education levels and who came from the upper or middle class level were more successful in business. But this was not the case for entrepreneurship since the study revealed that education level does not necessarily determine the entrepreneurship ability of an individual. The majority of the women in entrepreneurship had basic education as shown in Table 7 at 61%. While those who had advanced education were 31.9%.

The study found that, majority of the women entrepreneurs were in the age bracket of 18- 37 years and had basic education according to Table 7 and were 121 out of 323 respondents. The same age group had more single women in business as compared to the married ones at 98 and 86 respondents respectively. This supports the view of the desire of being a boss of one-self as it is reflected by the psychological characteristics of an entrepreneur as brought out by Gartner (1988) and cited by Diefenbach (2011).

The study found that the age group between 18- 37 years as shown in Table 19 had the highest frequency of using mobile phone services in their businesses at 100 out of 332 respondents. But it was discovered that the same group had the highest number of respondents who did not use advanced level functions mobile phone services to transact business. In addition the age group of 38- 57 years was using mobile phone services in their businesses but at 76 out of 332. Therefore the results indicates that most of the groups did not have majority of the women using more advanced functions mobile phone technology services in their businesses .This supports the findings of Reynold (2004) who found out that women entrepreneurs were unlikely to adopt technology in business if they were not familiar with its use or they don't have the capabilities to use the services. We can therefore say that all women entrepreneurs in Machakos County have acquired mobile phones for their businesses despite their different demographics, but they have not utilized all the services of the mobile phone and especially its advanced services which are equally important for running their businesses.

Advanced applications for example internet, which allow for the use of social media, email and e-marketing allow entrepreneurs to reach virtual markets and to be at the same level with other entrepreneurs who have adopted the advanced services for competitive advantage (Natasha, 2003). Business is all about information flow and networking, but without using advanced applications, women entrepreneurs are not able to grow their businesses to higher levels.

5.1.2 Extent of adoption and use of mobile technology services in empowering women entrepreneurs

The findings show that women entrepreneurs have embraced the mobile phone as an important gadget for their business. 99.1% of the respondents agreed that they owned a mobile phone (as shown in Table 8 in chapter 4). Only one respondent did not own a mobile phone. These findings are supported by the statistics in the literature reviewed which shows that by October 2012, Kenya had four licensed mobile phone providers with a total of 29.2 million subscribers between them and by the end of 2013, Kenya had 93% mobile users (Praekelt,2011). According to Demombynes and Thegeya (2011) using Kenya Afro barometer surveys (2011), 80% of adults in Kenyan own phones and another 10 percent have access to phone from in their households, and 3 percent used phones by someone outside their households. The study set out to investigate the extent of adoption and use of these mobile phones by women in their businesses.

The study found that women entrepreneurs in Machakos had adopted and used the mobile phone services for business matters but they had only adopted the basic functions of the mobile phone (as shown in tables 15 & 41 in chapter 4) and specially voice communication at (53.6%) and SMS at (21.1%) of the respondents. Most women entrepreneurs rarely used the advanced applications of the mobile phone with e-banking having the least used service in the mobile phone. Service like the internet had below average users at 17.5% of the respondents. These findings are in agreement with the literature reviewed that women avoid any technology which they feel is hard and requires learned skill (Kotelnikov, 2007). They also agree with TAM which suggests that the acceptability of an information system is predicted by its perceived usefulness and ease of use. The ease of use is the extent to which

one believes that the use of a particular system will be effortless. Most of the women entrepreneurs had basic education and this may be the reason they shied away from the more advanced mobile phone applications since they felt that they lacked the capability and skill to use the advanced applications. From the study, only a few women entrepreneurs attended any trainings and workshops to be sensitized on the use of the advanced applications. So the women entrepreneurs in Machakos missed on the benefits of using the advanced applications (Table 41).

The findings show that the mobile phone has changed the way of doing business. Women entrepreneurs have been increasingly turning to the mobile technology services which aid in business transactions and hence increased profits. Table 16 on mobile phone accessibility and increase of profits due to mobile phone use showed that 77.1% of the women entrepreneurs said that using mobile phone technology services for their businesses had led to increased profits. This is evidence that the mobile phone technology when harnessed well can improve entrepreneurship which could lead to better living standards for the women and their families and hence lead to empowerment. This claim is supported by Joseph (2005), who argues that it has become crucial for anyone doing business today to own a mobile phone due to the fact that it provides flexibility and efficiency and has become expected in the fast moving world of business. This was supported by the participants of the focus group discussions who all agreed that since they adopted mobile technology services in their businesses, their profits had increased remarkably.

In countries like the U.S.A where women have adopted mobile technology services in their businesses great transformation has been observed. The main drivers of this trend are, improved business practices and performance (Hamerman, 2010).

The study established that social media had gained a rapid acceptance and popularity among the women entrepreneurs although their use was below average. Facebook was the most popular social medium amongst the entrepreneurs (Figure 8) at 37%. Its popularity among women entrepreneurs can be attributed to the fact that Facebook provides interactive and immediacy, two things that are highly desirable to entrepreneurs. It can be used to market products and get new markets due to the high numbers of people using it. The current population of Facebook users in Kenya stands at 5 million which is 9.7% of the total Kenyan population (Internet world stats, 2015). The study contrasted with the discussion with the focus groups where a participant said;

F1: I always forget the password to my Facebook address therefore I have stopped using it and use WhatsApp which does need a password. In fact most of my customers prefer that we communicate through WhatsApp because it is easy and cheap as long as you buy daily bundles. I don't know how to use Twitter or Myspace and I have never tried because I think they are hard to learn.

Social networks such as My Space, YouTube, Twitter, WhatsApp and Facebook have been receiving a lot of public attention but very few women entrepreneurs in Machakos County use them. Social networks have become important avenues for marketing products and services among entrepreneurs (Kanyingi, 2011). Social networks have opened a wide market which if well harnessed by women entrepreneurs could lead to reaching new markets for their products and services.

The findings of this study show that 89.7 % of those interviewed agreed that mobile technology services enable them to access information. The mobile phone has made information search easier and cheaper. Therefore, the mobile phone reduces uncertainty by making it faster and cheaper to seek information to solve problems that are encountered daily (Muturi, 2012). Women in the developing countries and especially USA and Sweden have adopted the mobile phone to access information about the markets for their products, thereby improving their businesses (Joseph, 2005). They make use of all applications in the mobile phone and have been able to reach out for better markets for their products thereby improving their livelihood. In Kenya, lack of access to information among entrepreneurs makes them less aware of the available market opportunities. Entrepreneurs still face different challenges in accessing markets as a result of inadequate market information, poor marketing research and poor capacity in marketing leading to discrepancy between the supply and demand (KIPPRA, 2006). All women entrepreneurs in Machakos agreed that their businesses have grown since they started using the mobile phone and that they made more profit from their businesses (Tables 23& 37). This is a clear indication that when well harnessed, the mobile phone can lead to higher growth hence empowerment.

5.1.3 Factors influencing adoption and use of mobile technology services by women entrepreneurs

According to the findings of the study, most of the women entrepreneurs interviewed owned kiosks, retail shops and wholesales at 89.6%. Most of them at 45% owned retail shops as shown in Table 11. This concurs with other researches done on business ownership and especially with the findings of Donner & Escobari, (2010) on mobile phone use by micro and small entrepreneurs in developing countries. Their findings were that women entrepreneurs

are gendered towards their domestic roles and that they shy away from challenging areas like manufacturing and production. This also agrees with the literature reviewed that when women want to earn money they turn to their domestic skills to exploit in the micro-enterprises (Gakure, 2004).

The study found that most of the entrepreneurs interviewed were sole proprietors at 75.3% as compared to partnership at 24%, as shown in Table 12. This allows them to make strategic decisions about their businesses about which technology suits their businesses. According to the chairlady of the women group, most women go into business after failing to get formal employment or due to retrenchment. They set up businesses so that they become independent and make own decisions. They want to be independent and they do not even involve their husbands in the initial set- up.

From the study, it was discovered that 87% of the entrepreneurs used mobile phones for business transactions (Table 14). The findings concur with the theory of Uses and Gratification which stipulates that the users deliberately choose a medium that will satisfy given needs and allow one to enhance knowledge, social interactions and companionship (Tankard, 2000). This means that the mobile phone has become an important tool in business transactions. It has helped women entrepreneurs to reach their customers, suppliers and even pay utility bills from the comfort of their premises or homes or even when travelling. This has made running of businesses easier.

According to Table 15 the study found that Mpesa was the most widely used application with 87% of the respondents using it frequently. Mpesa is an application from the service

provider, Safaricom, to send and receive money. Since its inception in 2007, it has grown in popularity because it can serve both the banked and the unbanked (Mulwa, 2012). This was supported by a respondent, who runs a hotel in the focus group discussions by saying,

F4: Mpesa has revolutionized the way businesses are conducted and I cannot imagine running my enterprise without it. My suppliers are paid through Mpesa. This means that I would otherwise be spending a lot of business time going to pay them. But with the mobile phone, I simply reload my money and pay my suppliers and utility bills from the comfort of my hotel. I even have Paybill number which is registered allowing my customers pay via their phone. Life has become quite easier.

Women entrepreneurs have adopted Mpesa in their businesses since it is easy to use and this concurs with the TAM theory which postulates that people avoid technology deemed hard to use and adopt the technology which they feel is easy and doesn't require learned skill (Kotelnikov, 2007). It also agrees with the Uses and Gratification theory which stipulate that audience uses a medium which meets their needs and goals. Mpesa meets their need of transacting business by using the mobile phone.

5.1.3.1: Challenges of Using Mobile Phone Services

All the women in the two focus groups agreed that expenditure on air time was the biggest challenge, followed by lack of capability and skill, network failures, electricity charges, regulatory policies (Tables 35 &36). The majority of the women entrepreneurs agreed that it is costly to use mobile phones. This was based on the fact that the user has to pay first before calling or sending SMS through subscription or buying air time. A call costing 3 Kenya shillings per second during peak period is quite expensive in developing countries where the majority of women live below the poverty line. Machakos experiences intermittent power supplies where all women entrepreneurs interviewed had experienced frequent load shading. This is in agreement with the findings of Tripathi (2011) in India where insufficient

bandwidth, network failures, lack of security, power consumption and transmission interference were found to be a major challenge.

5.1.4 Role of information and communication flow in adoption and use of mobile technology services

The study established that interpersonal communication is the media which is commonly used by women entrepreneurs to get information about adoption and use of mobile technology services at 45.1% followed closely by mobile service providers at 31.6% (Table 44). The findings show that women entrepreneurs regularly consult family members, business colleagues and other business stakeholders. The findings are supported by the literature reviewed that women support groups influence the tools used to access information, women used close, informal support groups for their businesses, their spouses, relatives and women groups (Hinsrich and Peters, 2002). Opinion leaders play a great role in influencing diffusion of information. The women entrepreneurs would prefer getting information from those they are familiar with or can see outcome-evidence from business colleagues and that is why interpersonal communication is the preferred medium for information dissemination.

The findings revealed that service providers were the strong campaigners of adoption and use of mobile phone technology services at 41% while county government did the least campaigns at 4% (Figure 4). The study confirms the findings of Liu & Mithika (2009) who conducted a study in Nairobi about the use of mobile phone for banking by women and found that service providers were the main campaigners since they are in business and needed to market their products and keep up with their competitors.

When investigating the role of various stakeholders in training women entrepreneurs on adoption and use of mobile phone technology services, the study found that Radio and TV, and clients and colleagues, took the major role at 71% and 50% respectively. The county government was not doing enough in encouraging the women to apply the use of mobile technology services as the world is becoming a global village due to the use of technology. The county government should be the champion of adoption of mobile technology since they are mandated by the national government to bring technological change in the county. They should allocate resources in their county budgets to train and sensitize entrepreneurs on technologies which can enhance their businesses.

The study found that voice communication on the mobile phone at 52% was the service of the mobile phone technology that was mostly used by the women entrepreneurs in Machakos County. The least rated service was e-banking at 4% (Table 41). These findings agree with Mulwa (2012) study on financial e-banking inclusion of the poor whose findings were that the poor and unbanked do not use their mobile phones for banking. This might be caused by lack of knowledge on how to use the mobile phone for banking the profits they get from their businesses.

On the role played by TV/Radio, advertising of mobile technology services and programme training were the main activities used to promote adoption and use of mobile technology service at 66.9% and 17.8% respectively (Table 40 & 42). The service providers and the policy makers should use the media to promote the integration of technology and entrepreneurship and to encourage women entrepreneurs to adopt and use mobile technology.

The findings of the study showed that 74% of the women entrepreneurs in Machakos County were using the basic mobile technology services in their businesses (Table 41). This might be because of strong interpersonal communication which might have led to strong diffusion of information about mobile phone services among the entrepreneurs. If opinion leaders could be trained and encouraged on how to use mobile technology service, they can pass the same to the women entrepreneurs who would adopt and use it for their entrepreneurial activities.

On the area of empowering women entrepreneurs in Machakos County, the findings show that 23% of the women entrepreneurs have acquired new skills by using their mobile phones in business, 27% indicated that they have grown their business to higher levels even opening new branches while 31.6% attested to increasing their sales revenue (Table 43). These findings show that when properly harnessed, mobile phone technology can create a very great impact in the empowerment of women entrepreneurs.

On the frequency of campaigns for adoption and use of mobile phone technology services in Machakos County, only 33.6% of the participants accepted that campaigns have been going on to sensitize them on how to use mobile technology services in their businesses (Table 45). 51% of the participants did not respond to the question which means that majority of the women entrepreneurs were not aware that they should be trained on adoption and use of technology as the government is emphasizing on the use of technology in every sector. The county government and the service providers needs to use all available media to create awareness of mobile phone technology trainings in order to make sure that the women entrepreneurs turn up in large numbers so that they get informed uniformly and be on the same platform in business technology.

The study found that women entrepreneurs also used other media in their businesses but in small percentages. Newspapers were commonly used at 28%, followed by emails at 23% while Radio and TV were third at 21% (Table 46). These percentages show that apart from mobile phone technology services, other media were also used though minimally. This would mean that they have adopted and use mobile technology services fully for all their business transactions but this is not the case as the study established that women entrepreneurs in Machakos County have not fully adopted the advanced mobile technology services.

The frequency of use of social media for business transactions shows a below average picture on its adoption and use with only 25% of the women entrepreneurs agreeing use social media most frequently, 38% being frequent users while 20% established that they have never used social media (Figure 7). To be able to take advantage of social media and the benefits it can provide, there is need for training the women entrepreneurs so that they may utilize it more optimally given the large number of people who have subscribed to it. 31% of those who had subscribed to social media use it for marketing of new products, 18% to search for new markets and 17% for passing information (Figure 8). These percentages are way below average while it is appreciated world over that social media has a lot of uses for businesses and when properly integrated into business can lead to business growth. This means women entrepreneurs do not know the benefits social media can bring to their businesses. When harnessed properly, social media can lead to reaching out to new markets, advertising products and getting the best prices for their commodities. This is supported by the study done in Chennai, India where a network of women groups established since 2001 to expand

opportunities to market products using the cell phone for communication reported a positive correlation (Joseph, 2001).

5.2 Conclusion

The study found out that women entrepreneurs have accepted the mobile phone as an important tool for running their businesses but they have not fully adopted all the services of the mobile phone and especially the advanced functions. Women engage in business in order to earn profits and the mobile phone mediates activities in the community to enable women entrepreneurs increase their profits. It was observed that the women entrepreneurs who have adopted and used mobile phone technology services generated high revenues. Furthermore, it was confirmed by respondents that the use of mobile phone reduced business operation costs. The respondents further argued that the flow of information between value chain actors allowed and continued to allow for the exchange of information without travelling.

Women entrepreneurs used mobile phone technology services to open new markets and for selling and buying of products. In addition to the above, results of the focus group discussions revealed that the mobile phone facilitated women entrepreneurs in coordinating their business processes. The use of phone was found to be a tool widely used to coordinate business activities anytime, anywhere.

The researcher therefore concludes that mobile phone usage supports women entrepreneurs in their enterprises but it cannot replace face-to-face transactions which remain crucial among women entrepreneurs more particularly for meetings of group micro finance. Face-to-face can be done through advanced internet functions like Skype but since women

entrepreneurs had not adopted the advanced mobile phone applications, they didn't have the capability to use it so they depended on physical meetings.

Since majority women entrepreneurs in Machakos County had not adopted the advanced mobile phone applications they could not secure better markets and prices for their products, and could not negotiate for suitable prices and timely communicate business-related information that enables women entrepreneurs to run their business effectively. The respondents who had adopted and used the mobile phone services in their businesses concurred that the mobile phone had improved their businesses and they felt empowered but they faced some challenges which made it hard to adopt and use the advanced mobile phone technology services. Among the challenges included; expenditure on air time which was the biggest challenge, capability to use the mobile phone, network failures, and cost of smart mobile phone which has advanced applications, regulatory policies and electricity interruptions since the phone has to be charged regularly to remain in use.

Most of the women entrepreneurs in Machakos County agreed that the use of mobile phones is costly. To be able to make a call or to send a text message, the user had to first buying air time. A call costing three shillings per minute at peak time is quite expensive in developing countries where majority of women live below the poverty line. Kenya experiences intermittent power supplies, all women running business enterprises interviewed had experienced frequent 'Battery-low' load which meant that when the phone went off, their businesses were negatively affected and especially for those women who depended fully on the mobile phone for business transactions.

The study found out that, all stake holders involved in the roll out of mobile phone technology including the government, service providers, ICT experts and opinion leaders, were not doing enough to encourage and facilitate the women entrepreneurs to adopt and fully use the mobile phone technology services. The service providers seem to be more concerned on competition for customers in order to make more profit, such that they roll out many applications even before the previous ones have diffused to the entrepreneurs causing confusion and apprehension. Women entrepreneurs are not given adequate training to have knowledge on the use mobile phone services in their enterprises.

5.3 Recommendations

Based on the findings of this study the following recommends were made;

i) Regulators and Policy makers

The government should improve technology infrastructure since this is one of the main factors affecting the use of mobile phone technology by women entrepreneurs especially in the rural areas. The laying of the fiber optic cable for improved internet access has not had much impact on the women entrepreneurs (Demombynes & Thegeya, 2012).

Government ministries need to compile market information in databases for entrepreneurs to access. This should be updated regularly for relevance and currency. Intermediaries including the ministry of industrialization and Enterprise development, Ministry of Information Technology and Communication, SMEs associations and Research Institutions should have policies and regulations which support market information for entrepreneurs. The ministry of

Industrialization and Enterprise development need to develop an online trading portal for women entrepreneurs to connect them to markets and market information.

Improve technology literacy levels through training women entrepreneurs. Studies have shown that high technology literacy levels among entrepreneurs translated to higher degree of technology use in enterprises in other countries and especially the developed ones (Porteous, 2006). The government should incorporate entrepreneurship and technology training in primary school syllabus so that those women who opt to go to entrepreneurship after the basic education know how to use technology in their businesses since the study shows most of the entrepreneurs are those with basic education.

Despite the laying of several undersea cables, the cost of internet is prohibitive to most women entrepreneurs. So the ordinary person is not able to enjoy cheap and fast internet and this is a factor which has led most women entrepreneurs not to adopt mobile phone services fully. The regulators need to work with the other stakeholders to ensure cheaper and faster internet to the users.

The government needs to establish incubation sites in every county where entrepreneurs can go and be trained on technology and entrepreneurship. It should also put in place policies to protect the women entrepreneurs from exploitation through tariff control.

ii) Service Providers

The study found that most technology innovations lack a communication and information flow component so that it can diffuse smoothly to the masses. How a technology is

communicated to the masses determines its adoption effectiveness. The service providers in collaboration with the government should base any innovation with a communication process component. They need to overhaul hardware and radio network elements to improve network signals, voice quality, and speed of data to ensure stable and faster internet service.

The service providers need to develop relevant programs for entrepreneurs that are easy to use and increase accessibility to useful information. They should take advantage of the untapped market of women entrepreneurs (Wakunuma, 2008) and come up with tailor made programs which are gender based, reduce the prices of mobile handsets, and calling tariffs and open up branches in the rural areas for easy accessibility.

Language used in the phone applications should not jargonistic and difficult. It needs to be unpacked into plain English/Kiswahili and even in local languages so that the women who have basic education, and since from the study they are the majority in entrepreneurship, can understand and use the different applications in their mobile phones. The use of the mobile phone should be simplified by having fewer user steps which are self-instructive.

The service providers need to promote the use of various mobile applications already in use to improve market accessibility. This includes the use of popular social sites for marketing by women entrepreneurs, e.g. Facebook. This can be done through workshops, campaigns and promotions. Several enterprises are already using these sites to advertise their products and services, to communicate with potential customers.

Use of social sites will address the constraint of market spaces, high marketing costs, and use of intermediaries to reach more potential customers. Social sites have a very high traffic of potential customers who can be a ready market for products and services for women entrepreneurs across the country and especially in Machakos County. Social sites like OLX allows one to market get the best prices and sell commodities online. One only needs to take a picture of the product and post it online. The service providers should also do a close monitoring and evaluation to assess the uptake of their products so that they can restructure their applications to address women entrepreneurial needs.

iii) Women entrepreneurs

Women entrepreneurs need to embrace the more advanced mobile technology in their businesses in order to make more profits and to be able to reach out to other markets. Technology has made the world a global village hence for one to remain relevant in the business world; they have to embrace it (Khalifa, 2002). The study has highlighted the potential benefits of using the advanced mobile phone services in entrepreneurship, therefore women entrepreneurs and especially in Machakos where the study was done need to embrace the mobile phone advanced services fully, without relying on the basic uses in order to reap the benefits of using the mobile phone in their business transactions and hence improve their enterprises.

Women opinion leaders should encourage and support their members to adopt and use mobile phone technology services, and do a follow up to make sure the members adopt it fully. This can be a standing agenda during their organized meetings. Since interpersonal communication seems to be the most commonly used medium of passing information,

women entrepreneurs should be encouraged to share more information with their business colleagues and group members.

iv) Communicators

The current mobile phone usage in business transactions suffers from lack of communication context; therefore, communicators need to come up with communication strategies which will aid in information flow in the adoption of any technology. They also need to come up with gender based theoretical frameworks to gather knowledge in the operation of enterprises which will add knowledge to the adoption process of technology and especially mobile phone technology.

Business information provided via the mobile phone should be mediated through opinion leaders and progressive women entrepreneurs to enhance its credibility and uptake.

5.5 Recommendation for further research

1. The study recommends that a comparative research be carried between semi-urban and urban women entrepreneurs since the current study was on a semi-urban set-up only. This comparative study will help to find out if the application of mobile technology services in business by the urban and rural women entrepreneurs has significant difference due to the location of the entrepreneurs.
2. Kenya is sure to benefit from the rationalization of adoption of technology by women enterprises. However, in order to do so, women's consumer behaviors of mobile phones, first need to be studied in order to develop appropriate gender –sensitive

strategies. One of the crucial problems encountered in this research was the lack of empirical research on women entrepreneurship in Kenya, and more especially on women entrepreneurship and their use of mobile phones.

3. Globalization is one of the major aims of Kenyan vision, and this aim cannot be attained without the wide penetration of high powered mobile phones in the informal sector. Research is needed to find out the rate at which internet enabled mobile phones are bought by those in informal sector to use in their businesses. This study will help to ascertain the adoption rate since internet enabled phones have more advanced uses of the mobile phone which would give entrepreneurs a wider market area.

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APPENDICES

APPENDIX I: SUMMARY DESCRIPTION OF THE VARIABLES AND SCALE OF MEASUREMENTS FOR THE STUDY

Variables	Measurement of the independent variables	Scale	Instrument	Descriptive Statistical
<u>Mobile money transfer</u>				
M-Pesa	M-pesa account, sending and receiving, withdrawals and pay bills	Interval	Questionnaire and Key informant interviews	%
M-Banking	Savings, sending and receiving, withdrawals, payments, deposits, soft loans	Interval and nominal	Questionnaire, focus groups and key informant interviews	frequency & % of each category
M-Shwari	Savings, sending and receiving, withdrawals, payments, deposits, soft loans	Interval and nominal	Questionnaire, focus groups and key informant interviews	cross-tabs & % of each category
<u>Communication</u>				
SMS and Voice Calls	Numbers of sms and frequency of calls to customers	Interval	Questionnaire & interviews	Frequency, % of each category & cross-tabs
Making Orders	Check e-invoices, number of sms for orders	Interval	Questionnaire & document analysis	Frequency & % of each category
New skills	Record management, marketing, account	Nominal	Questionnaire & document analysis	

keeping

M-Marketing

Advertising	Increased sales and customers	Interval	Questionnaire, interviews & document analysis	Frequency, % of each category & cross-tabs
New markets	Number of branches opened	Interval	Questionnaire, interviews & document analysis	Frequency & %
New brands	Number of products created	Interval	Questionnaire, interview & document analysis	Frequency, % of each category & cross-tabs

Intervening Variables

Network	Availability of many service providers and boosters	Nominal	Questionnaire	Frequency, % of each category & cross-tabs
Cost of facilities	Amount spent	Interval	Questionnaire & document analysis	Frequency & %

Empowerment of Women entrepreneurs (Y) = Sales increase, profits, improved family welfare : Frequency, % of each category & cross-tabs

Source: Researcher, 2015

APPENDIX II: DECLARATION FORM

My name is Consolata Mutisya. I am a postgraduate student at the School of Journalism and Mass Communication, University of Nairobi. I am pursuing a Doctoral Studies in Communication Studies. I'm carrying out a study on *“The Adoption and Use of Mobile Technology by Women Entrepreneurs in Machakos County”*, as part of the degree award.

Therefore I request that you provide information as required by this questionnaire. Any information that you will provide will be kept confidential and will be used only for the purpose of this study. Thanks for your valuable time in filling this questionnaire.

Signature of the researcher.....

Date.....

Consent of the respondent

I have understood the purpose of this study and therefore consent voluntarily to participate as a respondent.

Signature of the respondent:

Date:

APPENDIX III: SURVEY QUESTIONNAIRE

SECTION 1: SOCIO DEMOGRAPHIC INFORMATION OF THE WOMEN

ENTREPRENEURS

No.	Questions	Answers	Skip
101	How old are you?	Record the number of years	
102	What is your marital status?	01-Married 02- Single 03- Widowed _ _ _ 04- Divorced 05-No answer	
103	State your highest Level of Education	01- Primary 02 - Secondary 03 - Undergraduate 04 - Post Graduate 05- No answer	

SECTION 2: EXTENT OF ADOPTION AND USAGE OF MOBILE TECHNOLOGY

No.	Questions	Answer	Skip
201	Do you have a mobile phone?	01- Yes 02- No _ _ _ 98- No Answer	If No, go to 203
202	If yes, what type of phone do you own?	01-Smart phone 02-windows Phone _ _ _ 03-No answer	
203	Do you have a social media account?	01-Yes 02-No 03-I don't know _ _ _ 98-No Answer	If No, go to 205
204	Do you access the social media sites on your phone?	01-Yes 02-No 03-I don't know _ _ _ 98-No Answer	If No, go to 206
205	If yes, which social media do you access most?	01-Face book 02- twitter 03- Linked In _ _ _	

		04 -Tag 98- No answer	
206	Do you have an Mpesa Account?	01-Yes 02-No 03-I don't know _ _ _ 98-No Answer	If No. go to 210
207	If yes, how often do use it?	01-Most Often 02-Often 03-Rarely _ _ _ 98-No Answer	
208	Do you have an Mshwari Account?	01-Yes 02-No 03-I don't know _ _ _ 98-No Answer	If No, go to 210
209	If yes, how often do you use it?	01-Most Often 02-Often 03-Rarely _ _ _ 98-No Answer	
210	Do you own a business premise?	01-Yes 02-No 03-I don't know _ _ _ 98-No Answer	If No, go to 212
211	If yes, what type of the business do you own?	01- A kiosk 02-Retail shop 03-wholesale 04-distributor _ _ _ 05-Producer 98-No answer	
212	Are you a sole proprietor or are you in partnership in business?	01- Sole proprietor 02-Partnership _ _ _ 03-No answer	If sole proprietorship go to 214
213	If partnership, who are your partners?	01-Family Business 02-women Groups _ _ _ 03-No answer	
214	Do you use your mobile phone for business transactions?	01-Yes 02-No 03-I don't know _ _ _ 98-No Answer	If No, ignore 216

215	If Yes, how often do you use your mobile phone for business transactions?	01-Most Often 02-Quite Often 03-Often _ _ _ 04-Not Often 05-Never	
216	The use of mobile technology has improved the performance of my business	01-Strongly agree 02 -Agree 03 -Not Sure _ _ _ 04- Disagree 05-Strongly Disagree	
217	I use mobile technology to save and get soft loans	01-Strongly agree 02 -Agree 03 -Not Sure _ _ _ 04- Disagree 05-Strongly Disagree	
218	I use mobile technology to make and receive payments	01-Strongly agree 02 -Agree 03 -Not Sure _ _ _ 04- Disagree 05-Strongly Disagree	
219	I use mobile phones to communicate with customers	01-Strongly agree 02 -Agree 03 -Not Sure _ _ _ 04- Disagree 05-Strongly Disagree	
220	Mobile technology has improved the level of interaction with the rest of the world	01-Strongly agree 02 -Agree 03 -Not Sure _ _ _ 04- Disagree 05-Strongly Disagree	
221	Has the use of mobile technology services increased your profit?	01-Yes 02 -No 03 -I don't know _ _ _ 04- No answer	
222	Is mobile technology easy to adopt for business?	01-Yes 02 -No 03 -I don't know _ _ _	

		04- No answer	
223	Are mobile technology services an efficient way of conducting business?	01-Yes 02 -No 03 -I don't know _ _ _ 04- No answer	
224	The adoption and use of mobile technology has made it easy to access information	01-Strongly agree 02 -Agree 03 -Not Sure _ _ _ 04- Disagree 05-Strongly Disagree	
225	Are you a member of Mobile Network Operators?	01-Yes 02 -No 03 -I don't know _ _ _ 04- No answer	
226	If yes above, how often do you sell and buy products using your mobile phone?	01-Most often 02 -Often 03 -Rarely _ _ _ 04- Not at all 05-No answer	

**SECTION 3: TO FIND OUT THE FACTORS THAT INFLUENCE THE ADOPTION
AND USE OF MOBILE TECHNOLOGY SERVICES BY WOMEN
ENTREPRENEURS IN MACHAKOS COUNTY**

No.	Question /Statements	Answer	Skip
301	Are Mobile Technology Services affordable?	01-Yes 02 –No 03 –I don’t know __ __ 04- No answer	
302	Mobile technology services are time saving	01-Strongly agree 02 -Agree 03 -Not Sure __ __ 04- Disagree 05-Strongly Disagree	
303	Have mobile technology services helped you to reach other markets?	01-Yes 02 –No 03 –I don’t know __ __ 04- No answer	
304	Mobile technology services promotes e-banking and e-marketing	01-Strongly agree 02 -Agree 03 -Not Sure __ __ 04- Disagree 05-Strongly Disagree	
305	Mobile technology services have helped my business in reaching far markets.	01-Strongly agree 02 -Agree 03 -Not Sure __ __ 04- Disagree 05-Strongly Disagree	
306	Mobile technology services are easy to use	01-Strongly agree 02 -Agree 03 -Not Sure __ __ 04- Disagree	

		05-Strongly Disagree	
307	Mobile technology services are easily available	01-Strongly agree 02 -Agree 03 -Not Sure _ _ _ 04- Disagree 05-Strongly Disagree	
308	Has adoption and use of mobile technology enhanced your business?	01-Yes 02 –No 03 –I don’t know _ _ _ 04- No answer	
309	Do mobile technology services provide immediate feedback?	01-Yes 02 –No 03 –Don’t know _ _ _ 04- No answer	
310	Does your phone access internet?	01-Yes 02 –No 03 –Don’t know _ _ _ 04- No answer	
311	If yes do you use internet in your business?	01-Yes 02 –No 03 –Don’t know _ _ _ 04- No answer	
312	Is the internet coverage signal enough for your business	01-Yes 02 -No 03-Don’t know _ _ _ 04-No answer	
313	It is expensive to adopt and use Mobile technology services	01-Strongly agree 02 –Agree 03 –Not sure _ _ _ 04- Disagree 05- Strongly disagree	

314	There is lack of knowledge by entrepreneurs about mobile technology	01-Strongly agree 02 -Agree 03 -Not Sure _ _ _ 04- Disagree 05-Strongly Disagree	
315	Do women have the right capability to adopt and use mobile technology?	01-Yes 02-No 03-I don't know _ _ _ 98-No Answer	
316	Can you afford a smart phone?	01-Yes 02 -No 03 -Don't know _ _ _ 04- No answer	
317	How often does power supply affect your phone charging?	01-Quite often 02 -Often 03 -Not often _ _ _ 04- Never 05- No answer	
318	What was your average monthly income before the adoption and usage of mobile technology in your business?	01-0-20,000 02-200001-40,000 03-40,000-60,000 04-60,000-80,000 05-80,001-100,000 _ _ _ 06-Above 100,000 98-No answer	
319	What is your current average monthly income after the adoption and usage of mobile technology in your business?	01-0-20,000 02-200001-40,000 03-40,000-60,000 04-60,000-80,000 05-80,001-100,000 _ _ _ 06-Above 100,000 98-No answer	

320	Without the use of mobile technology, how would your Business be performing currently?	01-Poorly 02-No difference 03-Better __ __ 98-No answer	
321	Has the government put any laws which affect your adoption and use of mobile technology services?	01-Yes 02 -No 03 -Don't know __ __ 04- No answer	

SECTION 4: THE ROLE OF COMMUNICATION AND INFORMATION FLOW IN THE ADOPTION AND USE OF MOBILE TECHNOLOGY.

No.	Question	Answer	Skip
401	How did you get to know and use mobile phones?	01- Service provider 02- Policy makers 03- Interpersonal __ __ 04 - Media 98- No answer	
402	Has the county government assisted in educating you on adoption of mobile technology?	01-Yes 02-No 03-I don't know __ __ 98-No Answer	If No, go to 404
403	If yes above, to what extent?	01-Great extent 02 -To some extent 03 -Not Sure __ __ 04- To a small extent 05-Not at all	
404	Have business clients and colleagues helped in passing information of adoption and usage of mobile technology?	01-Yes 02-No 03-I don't know __ __ 98-No Answer	

405	If yes above, through which media do they pass the information?	01- Interpersonal 02 –Print media 03 –Electronic media __ __ 04- Campaigns 05-Not at all	
406	Has television and radio played a role in the dissemination of information on the adoption and usage of mobile technology?	01-Yes 02-No 03-I don't know __ __ 98-No Answer	If No, go to 408
407	If yes above, which role has television and radio played?	01- Advertising 02 –Programmes 03 –Demonstrations __ __ 04- Campaigns 05-Not at all	
408	Newspapers and magazines have assisted me to adopt and use mobile technology	01-Strongly agree 02 -Agree 03 -Not Sure __ __ 04- Disagree 05-Strongly Disagree	
409	Interpersonal communication has assisted me in adoption and use of mobile technology	01-Strongly agree 02 -Agree 03 -Not Sure __ __ 04- Disagree 05-Strongly Disagree	
410	Have you ever attended a campaign to sensitize you about mobile technology?	01-Yes 02-No 03-I don't know __ __ 98-No Answer	If No, go to 413
411	If yes above, how often?	01-Most often 02-Quite often 03-Often __ __ 05-Not often	

412	If yes 410, how often have they been conducted?	01-Most often 02-Quite often 03-Often _ _ _ 05-Not often	
413	Who mostly conducts the campaign?	01- Government 02 –Service provider 03 –County government 04- Women leaders _ _ _ 05-Don't know	
414	Use of banners, posters and fliers has enabled me to adopt and use mobile technology	01-Strongly agree 02 -Agree 03 -Not Sure _ _ _ 04- Disagree 05-Strongly Disagree	
415	To what extent do business women know about mobile technology?	01-Great extent 02 –To some extent 03 -Not Sure _ _ _ 04- To a small extent 05-Not at all	
416	Do business colleagues use mobile technology services to run their businesses?	01-Yes 02-No 03-I don't know _ _ _ 98-No Answer	If No, go to 418
417	If yes above, which mobile technology service is often used?	01-Sms 02 –Voice communication 03 –Internet _ _ _ 04- Electronic payments 05-No answer	
418	Have you been empowered technologically by adopting and using mobile technology?	01-Yes 02-No 03-I don't know _ _ _ 98-No Answer	If No, go to 410

419	If yes above, how have you been empowered?	01- More income 02 -Business growth 03 -More skills _ _ _ 04- better living standards 05-All of the above	
410	I have attended training on mobile technology use.	01-Yes 02-No 03-I don't know _ _ _ 98-No Answer	
411	The adoption and use of mobile technology has made it easy to assess information	01-Strongly agree 02 -Agree 03 -Not Sure _ _ _ 04- Disagree 05-Strongly Disagree	
412	My customers and suppliers lack information about mobile technology services	01-Strongly agree 02 -Agree 03 -Not Sure _ _ _ 04- Disagree 05-Strongly Disagree	
413	Do you use the following media in your business?		
a	Email	01-Yes 02-No 03-I don't know _ _ _ 98-No Answer	
b	Letters, memos	01-Yes 02-No 03-I don't know _ _ _ 98-No Answer	
c	Newspaper/Magazines	01-Yes 02-No	

		03-I don't know _ _ _ 98-No Answer	
d	Television when advertising	01-Yes 02-No 03-I don't know _ _ _ 98-No Answer	
e	Social media sites e.g. OLX,Whatsapp, Twitter, Linkedin, Facebook, Tag	01-Yes 02-No 03-I don't know _ _ _ 98- No answer	
f	If often e, what business do you transact using social media?	01-Promoting products 02-Passing information _ _ _ _ 03-Marketing new products 04-Searching for markets 05- All of the above	
g	Face to Face interactions	01-Yes 02-No 03- No answer _ _ _	

Thank you for your cooperation

APPENDIX IV: INTERVIEW SCHEDULE FOR KEY INFORMANTS

Please note that for each interview, the designation of the interviewee will be written down

Service Providers (Safaricom and Airtel)

- i. One Safaricom personnel in charge of ICT and Business
- ii. One Airtel personnel in charge of ICT and Business

1. Extent of Adoption and Use of mobile technology services.

Are there registered women entrepreneurs in your database? If yes, how many of them are registered? Which services do they use and how frequent? How often do they come to your office to enquire about mobile phone services? What extent has the adoption and use of mobile technology impacted on the registered women entrepreneurs? What is the approximate age group that most frequently uses your services? Why do you think this is the case?

2. Factors influencing adoption and use of mobile technology services.

What factors influence the adoption of mobile phone technology services by women entrepreneurs in the County? What benefits have mobile technology brought to women entrepreneurs as a result of adoption and use? What challenges do you face while providing services to women entrepreneurs? How can these challenges be overcome? Do women come to your offices with complains about mobile technology services? If yes how often? Which complains do they bring? As a service provider, do you have any incentives to encourage adoption and use of mobile technology services by women entrepreneurs?

3. Role of communication and information flow in the adoption and use of mobile technology services

What role do you think communication and information flow play in the adoption and use of mobile technology? Which channel of communication do you use to reach out to the women entrepreneurs? Why have you chosen this channel? How do you advertise your services to the women entrepreneurs? Do you have sensitization campaigns/workshops for the women entrepreneurs? How do you get feedback on how your services are doing from the women business entrepreneurs? What success stories do you get from the women entrepreneurs who have adopted your services?

Women Group Leaders (Officials of women entrepreneurship groups)

- i. One chairlady of women entrepreneurship group
- ii. One secretary of women entrepreneurship group

1. Extent of Adoption and Use of mobile technology services.

What is your highest level of education? What position do you hold in the women group? How many members do you have? What is the average age of the members of your women group? What is their average education level? Do women in your group use mobile technology in business transactions? Which services do they use most often? To what extent has the adoption and use of mobile technology influenced their business transactions?

2. Factors that influence adoption and use of mobile technology services

What factors influence the adoption and use of mobile phone technology services by women members of your group? What benefits do members of your group get because of adopting

and using mobile technology in business transactions? What challenges do they face in adopting and using mobile technology services? Are there some women in your group who have not adopted and neither use mobile technology services? If yes, why is this case?

3. Role of communication and information flow in the adoption and use of mobile technology in the business?

Are there trainings/campaigns that have been conducted in the County for creation of awareness on the adoption and use of mobile technology in the Machakos County? If yes, who were the main facilitators? What was the impact of these campaigns on women entrepreneurs? Do you have meetings to discuss business issues? How often? What channel do you use to reach out to the members? How do you get feedback from your members on adoption and use of mobile technology services? What success stories do you get from the women who have adopted and use mobile technology services?

Ministry of Information Communication and Technology officials

i. Two officials' incharge of business enterprises

1. Extent of adoption and use of mobile technology services

What is the mandate of your ministry to women entrepreneurs? Have women entrepreneurs in Machakos adopted mobile technology services? If yes, to what extent have they adopted and use the technology services? Which mobile technology services do they mostly use?

2. Factors that influence adoption and use of mobile technology services

What influences the adoption and use of mobile technology services by women entrepreneurs? Are there policies the government has put in place to encourage the adoption and use of mobile technology by women entrepreneurs? What laws and regulations have

been implemented towards adoption and use of mobile technology services? How is the technology infrastructure in the county? What are the benefits of using mobile technology services by women entrepreneurs? What are the challenges? Does the government have any incentives to encourage adoption and use of mobile technology services?

Role of communication and information flow in the adoption and use of mobile technology services

Has your ministry conducted any campaigns/trainings in Machakos County to create awareness on the adoption and use of mobile technology among women entrepreneurs? If Yes, how often in a year? What is the response rate by women entrepreneurs? How do you get the feedback of the effectiveness of these campaigns/trainings from the women entrepreneurs? Which other channel of communication do you use to reach out to the women entrepreneurs?

Machakos County officials

Two county government officials in charge of business development

1. Extent of adoption and use of mobile technology services by women entrepreneurs

How many women entrepreneurs are registered in the county? Have women entrepreneurs adopted and use mobile technology services in the county? If No, why do you think they haven't? What is the extent of adoption and use of mobile technology services by these women? Which of the mobile technology services do they mostly adopt and use, why?

Factors that influence adoption and use of mobile technology services by women entrepreneurs

What factors influence the adoption and use of mobile technology services? What are the benefits of adoption and use of mobile technology by women entrepreneurs in the county? What are the challenges associated with the adoption and use of mobile technology in the County? What laws and regulations guide adoption and use of mobile technology by women entrepreneurs? Are there county by-laws that protect the women entrepreneurs? Does the county have sufficient technology infrastructure to encourage adoption and use of mobile technology services? How can the adoption and use of mobile technology be enhanced in the county?

Role of communication and information flow in the adoption and use of mobile technology services

Which media of communication do you use to reach out to women entrepreneurs? How effective is this media towards enhancing women entrepreneurship? Do you hold any trainings/campaigns to sensitize the women entrepreneurs on the adoption and use of mobile technology? If yes, how often? How do you get the feedback of the effectiveness of these trainings on the women entrepreneurs? Which communication policies have you put in place for the women entrepreneurs to encourage adoption and use of mobile technology services? Do you have meetings to discuss entrepreneurship and technology issues with the women entrepreneurs? If yes, how often?

APPENDIX V: FOCUS GROUP DISCUSSION GUIDE

For each group the age, educational level and marital status for each participant will be written down.

1. Extent of adoption and use of mobile technology services

Which mobile phone do you own? (*Probe for the types of phone*), How long have you used the mobile phone? Which services are there in your mobile phone? Do you use these services and what do you use them for? Which service do you use most? Do you have an M-pesaaccount? Do you have a paybill number? Are you a member of OLX? Which other social networks have you joined? Do you use the mobile phone for your business transactions (*probe for specific business transactions*) do you use your phone to market your products? How do you communicate with your clients using the mobile phone? Which service do you mostly use to communicate to them?

2. Factors influencing the adoption and use of mobile technology services

How can you rate your business now and before you started using the mobile phone services? (*probe for reasons for the difference or for no difference*) Do you think women entrepreneurs have adopted and use mobile phone services? If yes, why do you think they have adopted them? If no, what are the reasons for not adopting? What benefits have mobile technology services brought to your business? What challenges do you face when using your mobile phone for your business transactions? What do you think should be done to ease out these challenges? How can you rate your business now and before you started using your mobile phone services to transact business? Are you more empowered now since you started using your mobile phone to do business? In which ways are you empowered?

3. Role of communication and information flow in the adoption and use of mobile technology services

How did you know about the technology services in your phone? (*Probe for the source of information*), Have you ever gone to any services provider to ask for information about your mobile phone services? Have you ever attended training or campaigns about mobile technology? If yes, how helpful was it to you? Who organized the training or campaigns? What media did the conveners use to reach out to you? If yes how many times? If you have a complaint about your mobile connectivity, how do you communicate this to the service provider? How fast is the feedback? According to you what should be done to reach out the women entrepreneurs who have not adopted mobile technology?

Appendix VI: Research permit 1

THIS IS TO CERTIFY THAT: **Permit No : NACOSTI/P/15/9964/6579**
MS. CONSOLATA MUTINDI MUTISYA **Date Of Issue : 22nd June, 2015**
of UNIVERSITY OF NAIROBI, 3873-506 **Fee Recieved :Ksh 2000**
Nairobi, has been permitted to conduct
research in Machakos County
on the topic: NEW MEDIA AND
BUSINESS: ADOPTION AND USE OF
MOBILE TECHNOLOGY SERVICES IN
EMPOWERING WOMEN ENTREPRENEURS
IN MACHAKOS COUNTY.
for the period ending:
31st August, 2015



.....
Applicant's Signature

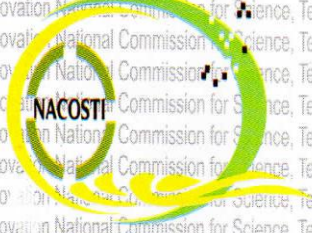

.....
Full Director General
National Commission for Science, Technology & Innovation

Appendix VII: Research permit 2

CONDITIONS

- 1. You must report to the County Commissioner and the County Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit.**
- 2. Government Officers will not be interviewed without prior appointment.**
- 3. No questionnaire will be used unless it has been approved.**
- 4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.**
- 5. You are required to submit at least two(2) hard copies and one(1) soft copy of your final report.**
- 6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice.**


REPUBLIC OF KENYA


NACOSTI

National Commission for Science, Technology and Innovation

RESEARCH CLEARANCE PERMIT

Serial No. A 5452

CONDITIONS: see back page

Designed & Printed by
Jaly Enterprises

Appendix VIII: Letter of authorization from the university for research



**UNIVERSITY OF NAIROBI
COLLEGE OF HUMANITIES & SOCIAL SCIENCES
School of Journalism & Mass Communication**

Telegram: Journalism Varsity Nairobi
Telephone: 254-02-318262, Ext. 28080, 28061
Director's Office: 254-02-2229168 (Direct Line)
Telex: 22095 Fax: 254-02-2229168
Email: director-soj@uonbi.ac.ke

P.O. Box 30197
Nairobi,
Kenya

Your Ref:

Our Ref: K90/94609/2014

Date: 25th May, 2015

TO WHOM IT MAY CONCERN

RE: CONSOLATA MUTISYA

The above named is a PhD student in the School of Journalism and Mass Communication.

She is proceeding to the field for collection of data for in Machakos County.

Her topic of research is "New Media and Business: Adoption and Use of Mobile Technology Services in Empowering Women Entrepreneurs in Machakos County."

This is to request you to accord her all the assistance she may need in the course of her research.

Any assistance accorded to her will be highly appreciated.


Ndung'u wa Munyve
Assistant Register
School of Journalism & Mass Communication

/aw



Appendix IX: Letter of authorization from NACOSTI for research



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
2241349, 310571, 2219420
Fax: +254-20-318245, 318249
Email: secretary@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No.

22nd Date: June, 2015

NACOSTI/P/15/9964/6579

Consolata Mutindi Mutisya
University of Nairobi
P.O Box 30197-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "*New media and business: Adoption and use of mobile technology services in empowering women entrepreneurs in Machakos County,*" I am pleased to inform you that you have been authorized to undertake research in **Machakos County** for a period ending **31st August, 2015.**

You are advised to report to **the County Commissioner and the County Director of Education, Machakos County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.


SAID HUSSEIN
FOR: DIRECTOR-GENERAL/CEO

Copy to

The County Commissioner
Machakos County.

The County Director of Education
Machakos County.

National Commission for Science, Technology and Innovation is ISO 9001: 2008 Certified

Appendix X: Letter of authorization from County commission for research



**THE PRESIDENCY
MINISTRY OF INTERIOR AND COORDINATION
OF NATIONAL GOVERNMENT**

Telephone: 21009 and 21983 - 90100
Email Address: countycommasaku@gmail.com
Fax No. 044-21999

OFFICE OF THE
County Commissioner
P.O. Box 1 - 90100
MACHAKOS.

When replying please quote

REF CC ADM 5/9 VOL I /108

29th June 2015

All Deputy County Commissioners

MACHAKOS

RE: RESEARCH AUTHORIZATION

This is to confirm that Consolata Mutindi Mutisya of University of Nairobi has been authorized to carry out a research on ***“Adoption and use of mobile technology services in empowering women entrepreneurs in Machakos County, ”*** for a period ending 31st August 2015.

Kindly accord her the necessary support to enable her achieve her goal.

Thank you.

A handwritten signature in black ink, appearing to be 'A G Kimani', written over a horizontal line.

A G Kimani
For: County Commissioner
MACHAKOS

Appendix XI: Letter of authorization from the ministry of education science and technology for research

MINISTRY OF EDUCATION, SCIENCE & TECHNOLOGY
STATE DEPARTMENT OF EDUCATION

Telegrams: "SCHOOLING" Machakos
Telephone: Machakos (
Fax: Machakos
Email - cdemachakos@yahoo.com
When replying please quote



OFFICE OF THE
COUNTY DIRECTOR OF
EDUCATION
P.O. BOX 2666-90100,
MACHAKOS

MKS/ED/CD/U/1/VOL.1

29th /6/ 2015

Consolata Mutindi Mutisya
University of Nairobi
P.O Box 30197 – 00100
NAIROBI

RE: RESEARCH AUTHORIZATION

In reference to a letter **NACOSTI/P/15/9964/6579** dated **22nd June, 2015** from the National Commission for Science, Technology and Innovation regarding the above subject. You are hereby authorized to carry out research on, **New media and business: Adoption and use of mobile technology services in empowering women entrepreneurs in Machakos County,**" for a period ending **31st August, 2015.**



Chacha C. Mwita
County Director of Education
Machakos