

**ADOPTION OF INFORMATION COMMUNICATION
TECHNOLOGY AND PERFORMANCE OF MICRO AND SMALL
ENTERPRISES IN NAIROBI CENTRAL BUSINESS DISTRICT**

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DECLARATION

This proposal is my original work and has not been submitted for a degree in any other university.

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DEDICATION

This research project is dedicated to my grandmother Makena for her passion in education even though she never had the opportunity to go to school and to my mother Nyaguthii who worked so hard and sacrificed everything to educate me.

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LIST OF ABBREVIATIONS

BI	Business Intelligence
BSC	Balanced Scorecard
CA	Communication Authority of Kenya
CBD	Central Business District
CRM	Customer Relationship Management
DOI	Diffusion of Innovation
ERP	Enterprise Resource Planning
GDP	Gross Domestic Product
GoK	Government of Kenya
HRMS	Human Resource Management Systems
ICEG	International Centre for Economic Growth
ICT	Information, Communication and Technology
IEA	Institute of Economic Affairs
IFC	International Finance Corporation
IMF	International Monetary Fund
IoT	Internet of Things
IS	Information Systems
IT	Information Technology
KB	Knowledge Base
KEPSA	Kenya Private Sector Alliance
KIPPRA	Kenya Institute for Public Policy Research and Analysis
KNBS	Kenya National Bureau of Statistics
KPAs	Key Performance Areas
MCAs	Member of County Assembly

MSEA	Micro and Small Enterprises Authority
MSEs	Micro, Small and Medium Enterprises
NGOs	Non-Governmental Organisations
OECD	Organization for Economic Co-operation and Development
PEOU	Perceived Ease of Use
PU	Perceived Usefulness
RBV	Resource Based View
ROI	Return on Investment
SCM	Supply Chain Management
SMEs	Small and Medium Enterprises
SPSS	Statistical Package for Social Sciences
TAM	Technology Acceptance Model
TRA	Theory of Reasoned Action
TOE	Technology Organization and Environment
UNCTAD	United Nations Conference on Trade and Development
VAT	Value Added Tax
WEF	World Economic Forum

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ABSTRACT

Information communication technology (ICT) adoption is an important phenomenon that is radically changing how businesses operate. With the recent developments in information technology in form of increased capacity, improved performance, accessibility to information and lower technological costs, every business must take advantage of this opportunity and invest in ICT. The Micro and Small Enterprises (MSEs) are the backbone of the Kenyan economy and provide huge opportunities for employment and economic growth. Adopting ICT would help these MSEs to grow, develop, increase market share and provide competitive advantage. This study aimed at establishing the extent of ICT adoption among MSEs in Nairobi Central Business District (CBD), to find out whether ICT adoption affects MSE performance and identify the barriers that limit ICT adoption. The study used Technology Acceptance Model (TAM), Technology Organisation and Environment (TOE) framework and Balanced Scorecard models. The research used descriptive research design and the data was collected through questionnaires. The sample size for the research was 120 MSEs based in Nairobi Central Business District (CBD). The questionnaires were distributed randomly to these MSEs who are in retail, wholesale, manufacturing and service industries. The data was then cleaned and sorted and captured in SPSS for analysis. The data was analysed through descriptive statistics and regression analysis used to establish the rate of ICT adoption, whether ICT adoption affects MSE performance and the barriers to ICT adoption. The study found that the mode of 43 out of the possible 60 scale of always using ICT, showing a good number of MSEs have adopted ICT but much more needs to be done to encourage ICT adoption. The study further observed that with the significance level of 0.000, the ICT adoption rate is a significant factor in MSE performance and an increase in the level of adoption increases the monthly revenue of MSEs by Kshs 13,144.31. The study also observed the number of employees have a positive relationship with the average monthly revenue. Furthermore, there are key ICT barriers that limit the level of ICT adoption such as high internet costs, high power costs, high hardware and software costs and lack of government support. The research provides a good background for further research on ICT adoption and the effects to MSE performance in Nairobi CBD.

CHAPTER ONE: INTRODUCTION

1.1 Background

The world is going through the fourth industrial revolution where capabilities of Information Communication and Technology (ICT) in processing and storage have increased tremendously. This has led to increase in access to information worldwide (World Economic Forum, 2016). Besides, this revolution has the potential to disrupt different industries and create new opportunities which drives growth and social changes. In addition, the future of countries, communities, businesses and individuals will heavily depend on the use of ICT in daily activities (WEF, 2016). Furthermore, the developed countries have now shifted from industrial economies to knowledge economies which are driven by the power of ICT. In the knowledge economies, the economic growth is determined by the ability to create, gather and distribute knowledge (Akomea-Bonsu & Sampong, 2012; Olusola & Oluwaseun, 2013).

The Micro and Small Enterprises (MSEs) are important global players as they enhance trade through provision of goods and services leading to poverty alleviation (WEF, 2016; Wolf, 2001). The MSEs enhance economic growth through encouraging innovation and creating employment (Machii & Kyalo, 2016). In Kenya, MSEs provide a source of income for over 70% of the population and contribute about 18.9 per cent of the GDP (KIPPRA, 2008). Despite the important role played by MSEs in economic development most MSEs are faced with several challenges. These challenges include globalisation, limited financial resources, limited market access and increased competition (Abor & Quartey, 2010; Kiveu & Ofafa, 2013; Machii & Kyalo, 2016). The MSEs can however adopt ICT to address these challenges and enhance their competitiveness through innovation, lower operational costs and increased productivity (Ajayi & Olayungbo, 2014; Alam & Noor, 2007).

Most of the large enterprises in both developed and developing countries have invested a lot of resources in ICT to facilitate the running of their businesses (Ashrafi & Murtaza, 2008). However, few MSEs in developing countries have fully embraced ICT to manage their businesses (Apulu & Latham, 2011). According to Manuere, Gwangwava and Gutu (2012) there are several barriers that limit adoption of ICT in MSEs. These barriers however vary from country to country and can be classified into internal and external limitations (Apulu, 2012).

ICT adoption plays a key role in enhancing both financial and non-financial performance of firms. This is reflected through growth in revenue, profits, number of employees and employee productivity. ICT provides both strategic and operational value to MSEs (Ademola et al., 2015). The extent to which adoption of ICT affects the performance of businesses is unique with different types of businesses (Parker & Castleman, 2007). This study seeks to determine the extent to which micro and small enterprises in Nairobi have adopted ICT and identify whether ICT adoption affects the performance of these businesses. The research will be descriptive research study and will make use of Technology Adoption Model (TAM), Technology Organisation and Environment (TOE) framework and Balanced Scorecard Models.

1.1.1 Information Communication Technology

Information Communication and Technology (ICT) is the combination of computer technologies (computer software and hardware) with telecommunication technologies such as images, voice and data (Laudon & Laudon, 2004). These technologies are used to collect, gather, store and provide the required output to support organisations (Apulu, 2011; Olise, Anigbogu, Edoko & Okoli, 2014).

In addition, ICT may also involve the use of computer applications such as accounting systems, inventory management systems, customer relationship management (CRM), payroll and human resource management systems (HRMS) and business analytics systems (BI) to manage business processes (Apulu, 2012; Ashrafi & Murtaza, 2008; Buhalis, 2003).

The adoption of ICT in developing countries like Kenya is still low compared to those of developed nations like United Kingdom, United States of America, China, Germany, France and Russia (Apulu & Latham, 2011). Most of the large enterprises have invested heavily in ICT to manage their businesses (Parker & Castleman, 2007). On the other hand, few MSEs have taken up ICT as a key driver in conducting their businesses (Akomea-Bonsu & Sampong, 2012). However, a number of barriers have limited MSEs from adopting ICT (Harindranath, Bernes & Dyerson, 2008).

ICT adoption fosters productivity of employees and enhances economic growth (Ashrafi, Al-Esmail & Manochehri, 2012). ICT adoption eliminates manual processes which are not only inefficient but also time consuming (Alam & Noor, 2009). Furthermore, adoption of ICT enhances employees' productivity and increases efficiency in provision of goods and services (Ashrafi & Murtaza, 2008). In addition, adoption of ICT enhances innovation and creativity of the businesses through research (Schubert, Fisher & Leimstoll, 2007). The innovation can lead to competitive advantage in the firm through identifying niche markets, product differentiation and cost reduction (Porter, 1990). Furthermore, ICT adoption enhances market access through the use of internet where the target market is not limited by the geographical location of the business (Kiveu & Ofafa, 2013). However, MSEs face several challenges while adopting ICT.

The barriers to ICT adoption include high internet costs, high software and hardware costs, limited employee ICT skills, lack of management support, unfavourable government policies and unfavourable business owner characteristics (Apulu & Latham, 2011; Ashrafi & Murtaza, 2008; Kapurubandara & Lawson, 2006).

1.1.2 Performance of Micro, Small and Medium Enterprises

According to Moullin (2003), business performance is a measure of how well a business is managed and ability to add value to its clients, investors and other interested parties. Furthermore, business performance is composed of both efficiency and effectiveness where the efficiency measures the economic value of the firms' resources while effectiveness measures the extent to which the stakeholders requirements are met (Neely et al., 2002). The balanced scorecard (BSC) is the most popular tool that is used to measure MSE performance and it makes use of both financial and non-financial dimensions (Wu, 2009). The variables include revenue, profit, number of employees and market share (Neely et al., 2002, Wu, 2009).

Several researchers have looked at how ICT adoption affects performance of businesses. According to Brynjolfsson and Hitt (1996), investing in ICT significantly improve the output of the firm. Furthermore, several studies agree that ICT adoption has affects the performance of MSEs positively (Oliveira & Martins, 2011; Parker & Castleman, 2007). This is reflected through increased productivity, increased profitability and increased customer base (Alam & Noor, 2009). However, the earlier studies in 1970s and early 1990s had observed that increased investment in ICT lead to lower business productivity in a phenomenon referred to as 'productivity paradox'. The 'productivity paradox' was caused by poor measurement of firm inputs and results, redistribution of revenues and poor management of information technology resources (Brynjolfsson & Hitt, 1996).

1.1.3 Micro and Small Enterprises in Nairobi

The MSEs in Kenya are categorised based on turnover, number of permanent employees and assets of the firm (KNBS, 2016). The micro enterprises in Kenya are firms that have nine employees or less or an annual revenue of less than five hundred thousand Kenya shillings, small enterprises are those that have between 10-50 employees and an annual revenue of between Kshs 500,000-5,000,000 while medium enterprises are firms that have between 51-100 employees (Government of Kenya, 2012).

The MSEs play an important part in both developing nations and those that are already developed. MSEs provide job opportunities and foster innovation which leads to sustainable growth and development and poverty reduction (United Nations Centre for Trade and Development, 2007). In Organisation for Economic Co-operation and Development (OECD) countries, over 95 per cent of businesses are MSEs and contribute about 60-70 per cent of employment in most of these countries (OECD, 2000). In Nigeria, MSEs employ about 50% of the work force and produce over 50% of production from industries (Ademola et al., 2015). In Cote d' Ivoire, MSEs comprise of 98 per cent of all the registered companies and contribute about 18% of the country's GDP (Ardjouman, 2014).

In Kenya, most of all modern businesses (75 per cent) are micro and small enterprises (KNBS, 2016). There are 1.5 Million MSEs that are licenced in Kenya and the majority of these are in Nairobi county (about 14 per cent). The contribution of MSEs to the economy has continued to increase over the years from 18.9 % of the GDP in 1999 to 33.8% of the GDP in 2015 (KNBS, 2016; Machii & Kyalo, 2016). The manufacturing sector contributes the highest to the GDP, followed by retail and wholesale, storage and educational services respectively (KNBS, 2016).

According to Machii and Kyalo (2016) MSEs are the bed rock of the Kenya economy. The MSEs sector in Kenya contributes about 33.8% of the GDP and produces about 87% of all the new jobs created in Kenya (KNBS, 2016). Despite the significant contribution of MSEs to the economy, MSEs face several challenges. These challenges include competition, lack of technical and managerial skills, poor infrastructure, dynamic customer needs and inaccessibility to financial credit facilities (Machii & Kyalo, 2016; Ongori & Migiro, 2011). The adoption of ICT helps to address some of these challenges through enhancing innovation, better communication with customers, credit facilities through mobile loans and improved market awareness (Ajayi, 2014; Machii & Kyalo, 2016).

1.1.3 Nairobi County

The Nairobi County was established in the current Kenyan constitution (2010) as part of the 47 counties in Kenya. Previously, the county was one of the eight provinces in Kenya. The county administration is composed of 17 constituencies which are further broken down into 85 wards. The executive arm of the county is composed of the county executive committee members (CECs), deputy governor and the governor (GoK). Nairobi is the capital city of Kenya where the national assembly, the senate and the state house are located.

According to the Nairobi County government records, the county has about 4,000,000 residents who live and work there making it the 14th largest city in Africa. The county occupies a total area of 696.3Km². Furthermore, the county is part of the Nairobi Metropolis which is composed of four counties: Nairobi, Kiambu Machakos and Kajiado. The Nairobi metropolis generates about 60% of the wealth in Kenya (KNBS, 2015). In addition, the county has the biggest population of both formal and informal MSEs currently estimated at 210,000 (KNBS, 2016).

The majority of these MSEs are based in the Nairobi Central Business District (CBD) due to the strategic location and easy accessibility by the thousands of Nairobi residents.

1.2 Problem statement

The ICT adoption is crucial to foster growth and survival businesses in both developed and developing countries (Manuere, Gwangwava and Gutu, 2012). According to the KNBS (2016) about 50 per cent of MSEs close within three years after being established. This means every MSEs in Kenya must be competitive in order to survive. Adoption of ICT gives firms competitive advantage (Porter, 1990). ICT adoption has positive effects on business performance (Brynjolfsson & Hitt, 1996; Dedrick et al., 2003; Tarute & Gatautis, 2014). Furthermore, ICT adoption increases revenue (Ashrafi & Murtaza, 2008), increases productivity (Ajayi & Olayungbo, 2014), increases market access (Machii & Kyalo, 2016) and improve customer service (Ongori & Migiro, 2011). However, several researchers have highlighted key limitations faced by MSEs while adopting ICT to run their businesses (Alam & Noor, 2009; Apulu & Latham, 2011).

The developments in ICT over the last decade has resulted in a lot of interest and considerable research on the subject (Parker & Castleman, 2007). Most of the empirical research on adoption of ICT is based on large enterprises (Alam & Noor, 2009). This is due to the unstructured nature of MSEs and limited information on the performance of MSEs (Al-Weshah & Al-Zubi, 2012). In addition, the research findings of large enterprises cannot be generalised in MSEs due to their unique characteristics (Oliveira & Martins, 2011).

Most of the available research on adoption of ICT in MSEs focus on benefits, factors affecting ICT adoption and challenges of ICT adoption (Alam & Noor, 2009; Apulu & Latham, 2011; Kapurubandara et al., 2006). However, there is limited research on how ICT adoption affects the MSEs performance (Parker & Castleman, 2007).

In Kenya, several studies have been done on ICT adoption in MSEs (Kanyaru & James, 2017; Machii & Kyalo, 2016; Ongori & Migiro, 2011; Wambaria, Kibas & Asienga, 2016). These studies however focus on the factors that affect ICT adoption such as owner characteristics, competition, government policies and industry support. In addition, Waweru and Ngugi (2015) in their study on the adoption of ICTs in supermarkets in Nairobi organisational structure affects ICT adoption in MSEs. There are very few studies on how the ICT adoption affects the performance of MSEs in Kenya. This research wants to increase knowledge by looking at the rate of ICT adoption in Nairobi CBD and assessing how ICT adoption affects performance of MSEs. The study will further look at limitations to adoption of ICT in Nairobi CBD.

1.3 Research objectives

The objective of this research is to study the level of ICT adoption in MSEs in Nairobi CBD and whether this adoption affects performance of MSEs.

The specific objectives are:

- a) Determine the extent to which MSEs in Nairobi have adopted ICT.
- b) To find out whether ICT adoption affects performance of MSEs in Nairobi CBD.
- c) Determine the barriers that limit ICT adoption by MSEs in Nairobi CBD.

1.4 Value of the study

This research is important to several stakeholders. The research is important to MSE owners both those who have already adopted and those who intend to adopt ICT. The study will find out how ICT adoption affects performance of MSEs and this information will help the business owners understand how they can improve their businesses operations by using ICT.

The study is important to Government of Kenya as it will identify the barriers that limit the adoption of ICT. The GoK can look at the barriers that limit ICT adoption and provide solutions to some of these barriers. This can be done through enacting of favourable laws and policies and implementing the existing laws that support ICT adoption in MSEs. The study will also be important to academicians and researchers who are interested in the study of ICT adoption and MSEs as it will increase the database of knowledge and used for further research. In addition, the research will be important to ICT vendors who are interested in providing ICT solutions to MSEs as the research will highlight the challenges and the work the ICT vendors can do to facilitate ICT adoption amongst the MSEs.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter will review the theoretical and empirical studies on the adoption of ICT and performance of MSEs. The chapter has three sections; theories of the research, empirical studies and research framework.

2.2 Theoretical Review

There are several theoretical models that look at ICT adoption and performance. In this study, Technology Acceptance Model (TAM), Technology, Organisation and Environment (TOE) Framework and Balanced Scorecard Model shall be discussed.

2.2.1 Technology Acceptance Model

Technology Acceptance Model (TAM) is a theory that is based on two factors: how useful the technology appears and how easy it is to use. The usefulness of use is the value brought by technology adoption. Ease of use is the minimum effort that a user requires to appreciate new technology (Apulu, 2012). The TAM model has been updated over time to include other factors such as perceived risk, experience, social influence and cognitive processes (Park, 2009).

The TAM has been used by several researchers in the study of adoption of ICT. Xiong, Qureshi and Najjar (2013) used the TAM to study how factors such as expected value of ICT, attitude and effort in usage affected ICT adoption in China. The team used the TAM model to measure the annual profit per person and found that perceived ease of use and perceived usefulness are key factors that affect adoption on ICT in SMEs in China. On the other hand, Alam and Noor (2009) used the TAM theory to study the ICT adoption in service sector in Malaysia. The study observed that the higher the value obtained from ICT, the higher the chances of ICT adoption.

In this research, TAM theory will be used to study the barriers of ICT usage in MSEs in Nairobi County.

2.2.2 Technology Organisation and Environment (TOE) Framework

The TOE framework was developed by Tornatzky and Fleischer in 1990. The framework categorised the factors affecting ICT adoption based on environment, organisation and technology (Oliveira & Martins, 2011). The technology factors are those that look at the level of technology both within and outside the firm (Apulu, 2012). The organisational factors include management structure, scope and size of the firm (Oliveira & Martins, 2011) while the environmental factors include government policies, competition and industry characteristics that affect the firm (Oliveira & Martins, 2011; Rahayu & Day, 2015).

Several researchers have used the TOE framework in their research on adoption of information communication technology. Apulu (2012) used the framework to come up with a successful framework for ICT adoption in developing countries. Furthermore, Manuere, Gwangwava and Gutu (2012) used framework to research on limitations to usage of ICT in SMEs in Zimbabwe. The study looked at the internal factors which are organisational and the external factors which include technological and environmental factors.

In this study, the theory will look at the limitations to adoption of ICT in MSEs in Nairobi CBD.

2.2.3 The balanced scorecard

The balanced scorecard is a tool used to assess how firms especially MSEs are performing (Kaplan & Norton, 1992). The model was developed to overcome the limitations of the traditional performance measurement tools which only focused on the financial performance of an organisation (Isoraite, 2008).

The model has four main perspectives; financial perspective to measure financial performance, customer perspective to manage customer service, internal perspective to measure internal business processes and learning perspective to measure the growth in employees' knowledge and organisational culture (Isoraite,2008; Kaplan & Norton, 1992). The balanced scorecard helps managers and business owners translate the vision and mission of the organisation into measurable objectives.

The balanced scorecard model has been used in several studies. In 2005, Dameri used BSC to check on how non-profit organisations perform after adopting ICT. She used the balanced scorecard to identify several performance indicators such as satisfaction of recipients, participation of volunteers, quality of services and amount of work load and then measure their use in the performance of non-profit organisation. The same technique can be used in the for-profit organisations (Dameri, 2005). Furthermore, Wu (2009) used BSC model to assess how SMEs in the ICT industries perform. Wu (2009) used several balanced scorecard measures such as financial results, customer orientation and staff morale in his study.

In this research, the balanced scorecard will be used to measure the financial performances of MSEs and how adoption of ICT affects this performance.

2.3 Barriers to information communication technology

The barriers to ICT adoption are those elements that limit the uptake of ICT in running businesses. Several empirical studies observe that there is lower adoption of ICT in MSEs compared with large enterprises and lower ICT adoption in developing countries compared with developed countries (Alam & Noor, 2009; Hashim, 2007; Ribadu, Mohammed & Sa'ad, 2014). This is due to the unique challenges that affect MSEs in developing countries. The barriers to ICT adoption in MSEs are broadly categorised into internal/business factors and external/environment factors (Ribadu et

al., 2014). The internal limitations include business owner and firm characteristics (Apulu & Latham, 2011; Hashim, 2007; Oliveira & Martins, 2011). The external barriers on the other hand are broken down into legal, economic, political, social cultural and infrastructure factors (Ashrafi & Murtaza, 2008; Ribadu et al., 2014).

2.3.1 Owner characteristics

The business owner characteristics refers to the attitude of the business owner towards ICT adoption and his/her ICT skills and knowledge. Several empirical studies demonstrate that business owners with positive attitude about adoption of ICT are more likely to use ICT. According to Hashim (2007), the more the ICT skills and knowledge a business owner has, the higher the possibility of adopting ICT. In addition, business owners who perceive the ICT as a tool that will provide competitive advantage to the business are more inclined to adopt the technology (Thong, 1999). The business owner support is therefore important in adopting ICT. If there is little management then the less likely the business will adopt ICT (Ashrafi & Murtaza, 2008).

According to Davis (1989), the attitude of the business owner is affected by the value added by technology and how the comfort in usage. This is affected by characteristics of technology such as simplicity, compatibility to existing environment and the ability to test the technology (Rogers, 1995). Therefore, if the ICT is complicated and difficult to use then the less likely it is to adopt that technology.

2.3.2 Firm characteristics

The organisational characteristics that affect ICT adoption include number of permanent employees, employee technical ICT skills, type of business and the organisational culture (Apulu, 2012; Hashim, 2007).

Most of the studies on the ICT adoption observe that there is a positive relationship between the size of business the ICT adoption (Oliveira & Martins, 2011; Thong, 1999). The smaller the size of the business, the lower the rate of ICT adoption (Hashim, 2007). Small organisations have few employees who may also not have high technical skills. This may limit the level of ICT adoption due to lack of skilled resources (Agboh, 2015).

The organisational culture and structure affect how the MSEs view the adoption of ICT. The organisational cultures which discourage innovation are less likely to adopt ICT (Oliveira & Martins, 2011). The firms may be uncomfortable with frequent changes in technology which may lead to resistance to change (Chitura, Mupemhi, Dube & Bolongikit, 2008).

2.3.3 External barriers

The external barriers hinder ICT adoption and come from outside the firm. They affect the whole industry and not just a single firm (Ashrafi & Murtaza, 2008). The external barriers include economic, social, cultural and technological factors (Alam & Noor, 2009; Al-Weshah & Al-Zubi, 2012; Apulu & Latham, 2011; Oliveira & Martins, 2008). The economic barriers are based on the strength of the economy as shown by indicators such as economic growth, foreign currency stability, economic stability and rate of inflation (Ribadu et al., 2014). When the economy is performing poorly then fewer businesses are likely to invest in ICT. According to Agboh (2015), the high cost of ICT adoption is a major challenge to ICT adoption in MSEs.

The MSEs business environments are influenced by the cultural and social factors. According to Oliveira and Martins (2008), businesses consider the type of technology the competitors, customers and suppliers are using and may be motivated to follow the industry leaders.

This is explained by the institutional theory which argues that the decision to adopt ICT can be influenced by cultural and social factors rather than individual factors. If there is no pressure from the industry to adopt ICT, then fewer businesses may adopt ICT (Ribadu et al., 2014).

The technological factors include the type of technology, availability of technical resources, user friendliness, security features and integration with other systems (Al-Weshah & Al-Zubi, 2012; Kapurubandara & Lawson, 2006; Oliveira & Martins, 2008). If the technology has low security features and cannot integrate with other systems then fewer businesses would adopt the technology (Ashrafi & Murtaza, 2008).

2.4 Empirical Review

The acquisition and adoption of ICT has increased globally over the last decade (UNCTAD, 2015). The adoption of ICT is driven by increased competition, lower software and hardware costs, good ICT infrastructure, easy to use systems, knowledgeable users and changing organisational cultures (Apulu, 2012; Ashrafi & Murtaza, 2008). ICT adoption plays a key role in both large and small enterprises. However, the ICT adoption is higher in large enterprises than in small enterprises as large enterprises have better resources such as more financial muscle and skilled human resources (Ashrafi & Murtaza, 2008). In addition, ICT adoption is higher in developed countries than in developing countries (Kapurubandara & Lawson, 2006). This is because developed countries have better ICT infrastructure, social and cultural factors that support ICT adoption (Ashrafi & Murtaza, 2008; Kapurubandara & Lawson, 2006).

The adoption of ICT enhances the competitiveness of MSEs (Oliveira & Martins, 2011). Several researchers have enumerated the benefits of ICT adoption in firms. According to Liang and Liu (2010), ICT adoption enhances the internal business processes and supports the business relationships with both the customers and suppliers. In addition, ICT adoption reduces duplication of work which leads to efficiency in production of goods and services (Barua et al., 2004). Furthermore, adoption of ICT helps firms to compete globally through the internet and enjoy the marketing benefits that were previously available only to large organisations (Mutula & Brakel, 2006).

The performance of MSEs is the value that firms bring to several stakeholders (Moullin, 2003). There are several methods that can be used to measure the performance of MSEs. Balanced Scorecard is most common performance measurement tool (Wu, 2009). Through the balanced scorecard, several parameters such as annual revenue, annual profit, number of customers, the time it takes to serve customers and suppliers can be used to measure the performance of MSEs (Biazzo & Garengo, 2012).

ICT adoption influences the performance of MSEs. Some empirical studies have observed that ICT adoption contributes positively to the performance of firms (Ashrafi & Murtaza, 2008; Brynjolfsson & Hitt 1996, Chiware & Dick, 2008; Kapurubandara & Lawson, 2006 Oliveira & Martins, 2011). Other studies however argue that adoption of ICT has little or no effects on the performance of businesses (Brynjolfsson, 1995; Carr, 2003). According to Wolf (2001), adoption of ICT leads to substituting ICT equipment with labour and capital and generates good returns for businesses.

These observations are consistent to those of Brynjolfsson and Hitt (1996) when they studied the productivity of large United States firms and observed that the production significantly increased on adoption of ICT.

There are however several barriers that hinder the acquisition and usage of ICT in developed and developing nations. According to Parker and Castleman (2007), the barriers to ICT adoption are categorised into internal/firm and external/environment barriers. The firm limitations are those that the firm can overcome internally and include; size of the firm, management support and availability of technical ICT skills (Alam & Noor, 2009; Apulu, 2012). External barriers on the other hand are outside the control of the firm and includes the available technology, industry competition, poor ICT infrastructure and government legislation (ApuLu & Latham, 2011; Ardjouman, 2014; Ashrafi & Murtaza, 2008).

In the developing countries, Alam and Noor (2009) carried out a study on how usage of ICT affects SMEs in Malaysia. The study observed that most MSEs do not realise the benefits accrued in ICT adoption. In addition, Ardjouman (2014) in his study on the factors that affect adoption of ICT by small organisations in Cote d' Ivoire observed that lack of technical skills, inadequate ICT infrastructure and unreliable sources of power limit ICT usage. According to Manuere et al. (2012), limited support from management and scarce technical resources limits most MSEs from adopting ICT. Furthermore, Apulu and Latham (2011) in their research on what drives ICT adoption in Nigeria concluded that high cost of internet and unstable power sources limit usage of ICT.

In Kenya, Machii and Kyalo (2016) observed that ICT infrastructure and management support is a key determinant on ICT adoption. In addition, government policy on MSEs can either discourage or enhance ICT adoption in MSEs (Machii & Kyalo, 2016). For instance, the reduction of taxes on computer hardware and software in Jordan stimulated ICT adoption in SMEs (Al-Weshah & Al-Zubi, 2012). Furthermore, according to Kapurubandara and Lawson (2006) political environment is a major consideration in ICT adoption and can either enhance or hinder ICT adoption. Moreover, industry factors such as competition and technical support are key ICT adoption determinants (Ongori & Migiro, 2011). When there is little competition in the industry and there is no technical support on ICT, MSEs are least likely to adopt ICT (Al-Weshah & Al-Zubi, 2012; Mutula & Brakel, 2006).

2.5 Conceptual Framework

The conceptual theory is the summary of the relationship between the dependent and independent variables (Mugenda & Mugenda, 2003). In this research the dependent variable is the performance of MSE. The independent variable is the ICT adoption while the moderating variables are the characteristics of the firm that include number of permanent employees, age of the owner of the firm and period of running the business.

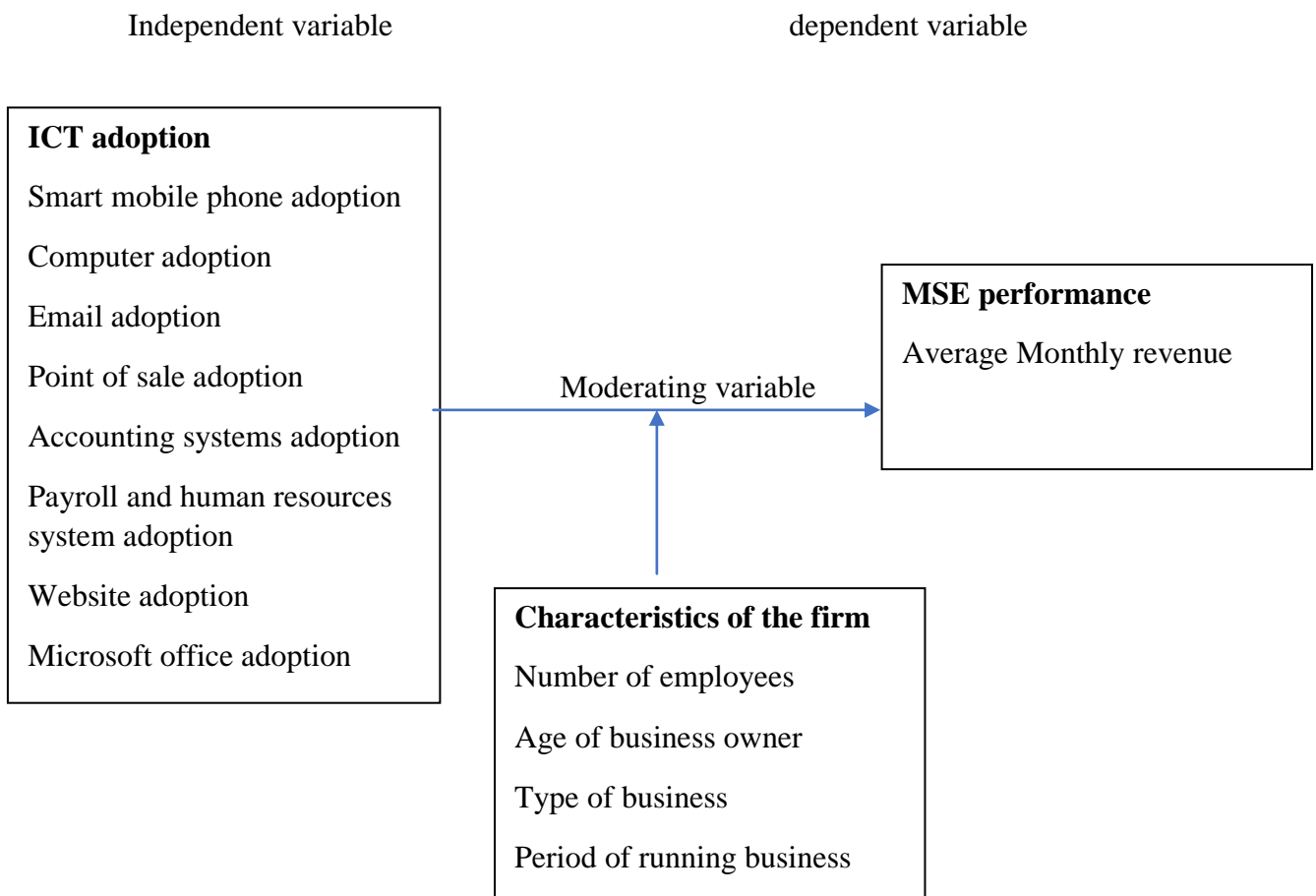


Figure 3.1: Conceptual Framework

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The research methodology chapter will cover the research design, population, sample design, data collection methods and data analysis that will be used in this research.

3.2 Research design

The descriptive research design will be used in this research. The study is aimed at identifying the level of ICT adoption in Nairobi and how ICT adoption affects the performance of MSEs. The MSE business owners are the target audience for this research. A cross sectional survey will be carried out in this research as the performance of MSEs will be measured using the average monthly revenue during the period of research.

3.3 Target population

The target population this research is the licensed MSEs in Nairobi CBD. According to the Kenya National Bureau of Statistics (KNBS, 2015), the licenced MSEs in Nairobi County are about 32,000. This is the target population for this research.

3.4 Sampling Design

The data collection was carried out through both stratified random sampling and judgemental sampling. The researcher categorised the samples into groups based on the industry. These industries were hospitality, manufacturing, service, wholesale and retail sectors. In addition, the researcher targeted more micro enterprises compared to small enterprises as micro enterprises are more (83% of the all the licensed MSEs in Nairobi as per KNBS (2016).

A sample size of 120 MSEs in Nairobi CBD was selected. The samples were allocated among the four industries: retail, manufacturing, wholesale and service industries. The samples were then selected randomly among these industries.

3.5 Data Collection

The primary data was used for this study. The data was taken from the MSEs through structured questionnaires. The questionnaires had both open and closed ended questions. The five Likert scale was used to score the responses. The questionnaires were divided into three parts. These are; demographics of respondents, average monthly revenue to measure performance and barriers to ICT adoption respectively. The questionnaires were issued to respondents by hand and given time to complete the questionnaires. The instruments were then tested to ensure validity and completeness of data.

3.6 Data Analysis

The data from the questionnaire was organised properly and coded before being captured for data analysis. The coding helped to give meaning to the data and ensured that the information is sensible. The data was captured and analysed in Statistical Package for Social Sciences (SPSS).

The objective of extent of ICT adoption in Nairobi CBD was analysed using descriptive statistics. A five-level likert scale was used to assess the level of ICT adoption. Frequency distribution tables was used for each ICT tool to see the extent in which each one of the tools is used by business owners to run MSEs. The objective of barriers to ICT adoption was achieved through descriptive statistics. Frequency distribution tables were used from the five level likert scale from each barrier to ICT adoption.

The objective of establishing whether ICT adoption affects MSE performance was measured using linear regression analysis.

The following is the regression model that was used to analyse:

$$Y = a_0 + a_1 X_1 + a_2 X_2 + a_3 X_3 + a_4 X_4 + e$$

Where Y= MSE performance

X_1 =ICT Adoption

X_2 =Number of employees

X_3 =Period of business operation

X_4 =Age of business owner

a_0, a_1, a_2, a_3 and a_4 = coefficient parameters

e=error term

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter will discuss the results of the study. The demographical characteristics of business owners, level of ICT adoption, any relation between the rate of adoption of ICT and MSE performance and the barriers to ICT adoption will be discussed. A total of 120 MSEs were targeted and issued with a questionnaire. Eighteen questionnaires were incomplete and therefore excluded from the data processed. The research therefore used 102 research instruments which represents 85% response rate of the questionnaires.

4.2 Demographic analysis

This section will discuss the behaviour of the respondents that include highest level of education, gender, age, number of permanent employees and nature of business.

4.2.1 Gender

The gender characteristics of the business owners is shown in table 4.2.1 below:

Table 4.2.1 Gender of MSE owner

	Frequency	Percent
Male	67	65.7
Female	35	34.3
Total	102	100.0

The is also reflected in figure 4.2.1 below:

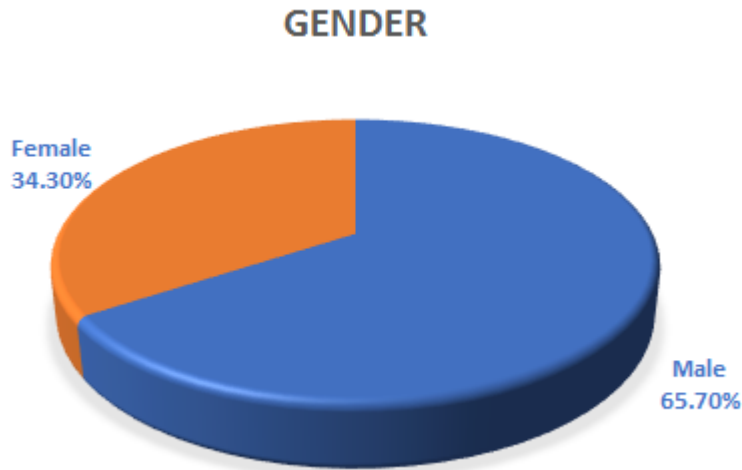


Figure 4.2.1: Gender of business owners

The figure shows that most of the MSEs that were surveyed are owned by men at 65.7% while women business owners surveyed were 34.3% of the sample.

4.2.2 Period of business existence

The minimum number of years of business existence is one year while the oldest has been in existence for twenty years. Most of the MSEs have been running for three years. This is shown in table 4.2.2 below:

Table 4.2.2: Period of business existence

Median	4.0000
Mode	3.00
Minimum	1.00
Maximum	20.00

4.2.3 Age of firm owner

The age of the firm owner is an important demographic characteristic. The minimum age of the business owners was 20 while the maximum age is 50 years old as per table 4.2.3.1 below. The mean age is 30 years while the mode is 27 years. This shows that the majority owners of MSEs in Nairobi CBD are the youth.

Table 4.2.3.1:Age of business owner

Mean	30.8922
Median	30.0000
Mode	27.00
Minimum	20.00
Maximum	50.00

4.2.4 Highest Level of Education

The research also captured the status of highest academic qualification of the business owners. Table 4.2.4 below shows the education qualifications of firm owners which range from primary school to post graduate level of education. With the mode of 6, the business owners are well educated with most having university degrees.

Table 4.2.4: Level of education

Mean	5.2059
Median	5.0000
Mode	6.00
Minimum	2.00
Maximum	7.00

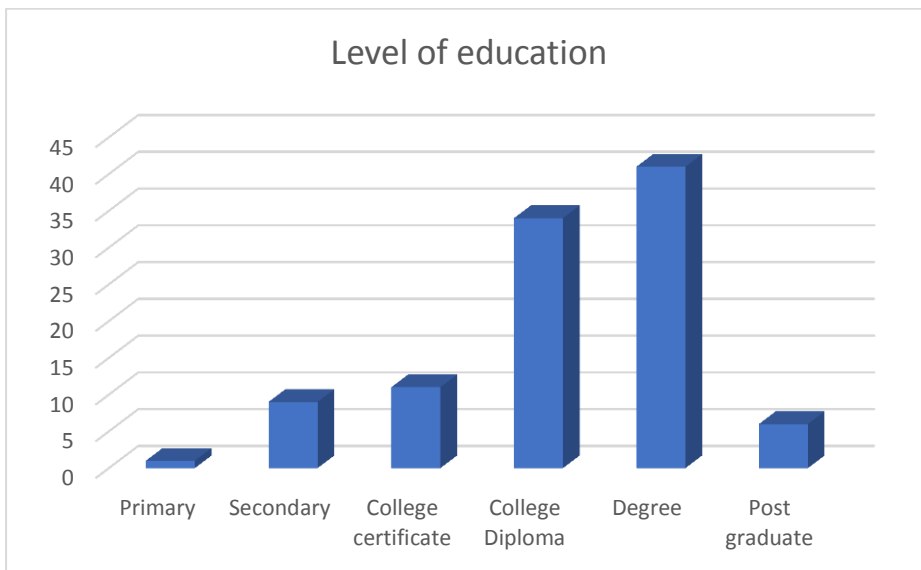


Figure 4.2.4: level of education

4.2.5 Number of employees

The research also sought to find out the number of permanent workers in the business. The minimum number of workers is the MSEs are one while the maximum number is 20. The mode number of workers is 1 which shows the majority of MSEs surveyed have one employee. This fits into the definition of micro enterprises which should have between one and nine employees.

Table 4.2.5: Number of employees

Median	2.0000
Mode	1.00
Minimum	1.00
Maximum	20.00

4.2.6 Nature of business

The research further collected data on the industries where the different MSEs belong to. Table 4.2.5 below shows the frequency of the MSEs in the different industries. Most of the MSEs surveyed are in retail (40.2%), followed by manufacturing (23.5%) followed by service industry (20.6%) and finally wholesale at 15.7%.

Table 4.2.5: Type of Industry

	Frequency	Percentage
Retail	41	40.2
Wholesale	16	15.7
Manufacturing	24	23.5
Service Industry	21	20.6
Total	102	100.0

4.3 ICT Adoption

This section will discuss the different ICT tools and how the MSEs surveyed have adopted these tools.

4.3.1 Adoption of smart-mobile phones

Table 4.3.1 below shows the adoption of smart mobile phones.

Table 4.3.1: Smart mobile phones usage

	Frequency	Percent
Never	4	3.9
Rarely	7	6.9
Not sure	2	2.0
Often	23	22.5
Always	66	64.7
Total	102	100.0

The table shows that the majority of MSEs owners surveyed (66%) always use smart mobile phones while 3.9% have never used mobile phones to run their businesses. This shows a high adoption level of smart mobile phones.

4.3.2 Tablet devices

The adoption of tablet devices by MSEs is shown in table 4.3.2 below. From the table, 21.6% of the respondents have never used tablet devices, 19.6 % rarely use, 24.5% often use while 27.5 % always use table devices to run their businesses.

Table 4.3.2: Adoption of tablet devices

	Frequency	Percentage
Never	22	21.6
Rarely	20	19.6
Not sure	7	6.9
Often	25	24.5
Always	28	27.5
Total	102	100.0

4.3.3 Adoption of Computers

The usage of computers is shown in table 4.3.3 below. From the table, 12.7% of the respondents never use computers, 7.8% rarely use, 23.5% often use while 52.9% always use computers to run their businesses.

Table 4.3.3:Adoption of computers

	Frequency	Percentage
Never	13	12.7
Rarely	8	7.8
Not sure	3	2.9
Often	24	23.5
Always	54	52.9
Total	102	100.0

4.3.4 Fiscal printers

The usage of fiscal printers is shown at table 4.3.4.below. According to the table, 32.4% of the respondents have never used fiscal printer,15.7 % rarely use, 17.6% often use while 32.4% always use fiscal printers.

Table 4.3.4: Adoption of fiscal printers

	Frequency	Percentage
Never	33	32.4
Rarely	16	15.7
Not sure	2	2.0
Often	18	17.6
Always	33	32.4
Total	102	100.0

4.3.5 Adoption of Point of sale

The adoption of point of sale (POS) in MSEs is shown in table 4.3.5 below. According to the table, 33.3% of the respondents have never used POS, 12.7% rarely use POS,12.7% often use while 35.3% always use POS to run their enterprises.

Table 4.3.5: Adoption of Point of Sale

	Frequency	Percentage
Never	34	33.3
Rarely	13	12.7
Not sure	6	5.9
Often	13	12.7
Always	36	35.3
Total	102	100.0

4.3.6 Social media adoption

Social media platforms such as Facebook, WhatsApp, Twitter, Instagram and LinkedIn are very popular ICT tools for MSEs. According to the study, only 6.9% have never used social media applications to run their business while 4.9% rarely use the applications. The study further indicates that 37.3% of the respondents often use social media which 47.1% always use social media to run their enterprises. This data is shown at table 4.3.6 below.

Table 4.3.6:Adoption of Social media

	Frequency	Percentage
Never	7	6.9
Rarely	5	4.9
Not sure	4	3.9
Often	38	37.3
Always	48	47.1
Total	102	100.0

4.3.7 Adoption of Websites

According to table 4.3.7 below, 25% of the respondents have never used a website to run their businesses, 16.7% rarely use, 27.5% often use while 24.5% always use a website.

Table 4.3.7: Adoption of Websites

	Frequency	Percentage
Never	26	25.5
Rarely	17	16.7
Not sure	6	5.9
Often	28	27.5
Always	25	24.5
Total	102	100.0

4.3.8 Adoption of Email applications

Table 4.3.8 below shows how the email applications have been adopted by MSEs. According to the table, 14.7% of the respondents have never used email applications, 10.8% rarely use email applications, 27.5% often use while 44.1% of the respondents always use email applications. This shows that a huge number of business owners communicate through email while running their businesses.

Table 4.3.8: Adoption of Email applications

	Frequency	Percentage
Never	15	14.7
Rarely	11	10.8
Not sure	3	2.9
Often	28	27.5
Always	45	44.1
Total	102	100.0

4.3.9 Adoption of Accounting systems

The surveyed MSEs showed that 26.5% of the respondents never use accounting system,10% rarely use, 23.5% often use and 30.4% always use accounting systems.

This is shown in table 4.3.9 below.

Table 4.3.9: Adoption of accounting systems

	Frequency	Percent
Never	27	26.5
Rarely	11	10.8
Not sure	9	8.8
Often	24	23.5
Always	31	30.4
Total	102	100.0

4.3.10 Adoption of inventory management system

According to table 4.3.10 below, 34.3% of the respondents have never used an inventory management system in their business,14.7% rarely use inventory system,19.6% often use while 22.5% always use inventory management systems to manage their inventory. This shows that only a few MSEs have adopted an inventory management system as only 22.5% use the system all the time.

Table 4.3.10: Adoption of inventory management systems

	Frequency	Percentage
Never	35	34.3
Rarely	15	14.7
Not sure	9	8.8
Often	20	19.6
Always	23	22.5
Total	102	100.0

4.3.11 Adoption of payroll and human resources system

The study shows that 39.2% of the respondents have never used payroll and human resource system, 19.6% rarely use, 14.7% often use and 17.6% always use the system. This is shown in table 4.3.11.1 below. Most of those who never use and rarely use the payroll and human resource system have very few employees while those with more employees often use the payroll and human resource system as shown in table 4.3.11.2 below.

Table 4.3.11:1 Adoption of payroll and human resource system

	Frequency	Percentage
Never	40	39.2
Rarely	20	19.6
Not sure	9	8.8
Often	15	14.7
Always	18	17.6
Total	102	100.0

Table 4.3.11:2 Payroll and human resource system by number of employees

			Never	Rarely	Not sure	Often	Always
Number of	1-9	Count	39	20	9	12	15
Employees	employees	%	41.1%	21.1%	9.5%	12.6%	15.8%
	10-50	Count	1	0	0	3	3
	employees	%	14.3%	.0%	.0%	42.9%	42.9%

4.3.12 Adoption of Microsoft office applications

Table 4.3.12 shows the adoption of Microsoft office applications by MSEs surveyed. According to the research, 12.7% have never used Microsoft office applications, 2% rarely use Microsoft office, 23.5% often use and 60.8% of the respondents always use the applications. This shows that Microsoft applications are very popular among MSEs.

Table 4.3.12: Adoption of Microsoft Office applications

	Frequency	Percentage
Never	13	12.7
Rarely	2	2.0
Not sure	1	1.0
Often	24	23.5
Always	62	60.8
Total	102	100.0

4.3.13 Overall ICT adoption rate

Table 4.3.13 below shows the summarised data on ICT tools discussed in this study. These include the adoption of smart mobile phones, tablet devices, computers, fiscal printers, point of sale, social media, emails, accounting systems, inventory management systems, human resource management systems and Microsoft office applications.

Table 4.3.13: ICT adoption summary

Mean		41.2549	
Median		43.0000	
Mode		43.00 ^a	
Range		48.00	
Minimum		12.00	
Maximum		60.00	
Percentiles	25	32.7500	
	50	43.0000	In the range between 12 (never used) and
	75	50.0000	60 (always use), the mode and median of

the different ICT tools is 43. This lies in the 50th percentile. This shows that the overall ICT adoption rate is good but there is still more work that needs to be done to encourage the MSEs to adopt ICT.

4.4 MSE Performance

The study aimed to establish whether ICT adoption has an effect on the MSE performance. The regression study was done to establish how period the running business, age of the firm owner, number of permanent workers and the rate of ICT adoption affects the performance of MSEs. The regression equation is provided below:

$$R = a_0 + a_1 X_1 + a_2 X_2 + a_3 X_3 + a_4 X_4 + e$$

Where R= MSE performance

X_1 =ICT Adoption

X_2 =Number of employees

X_3 =Period of business operation

X_4 =Age of business owner

a_0, a_1, a_2, a_3 and a_4 = coefficient parameters

e =error term

The analysis of the regression is shown in table 4.4.1 and 4.4.2 below.

Table 4.4.1: Significance levels

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-				
		155695.08	132614.548		-1.174	.243
		4				
	Actual Adoption Rate	7612.821	2064.534	.356	3.687	.000
	Period of business operation	3585.884	6704.978	.060	.535	.594
	Age of business owner	597.627	4074.424	.016	.147	.884
	Number of employees	13144.307	6309.870	.214	2.083	.040

Table 4.4.2: Coefficient of determination

Model	R	R Square	Adjusted R
			Square
1	.517 ^a	.267	.237

From the results above, the significance level for the adoption of ICT is 0.000. This shows that the ICT adoption level is significant to affect the monthly revenue of

MSEs. It is evident that a basic increase in adoption of ICT increases the average monthly revenue by Kshs 7612.82. On the other hand, the significance level for period of business operation is 0.594. This means that the level is insignificant and therefore the period of business operation doesn't affect the average monthly revenue. In addition, the significance level for the age of firm owner is 0.884. This shows that the age of the business owner is insignificant and doesn't affect the average monthly revenue of MSEs. However, the significance level for the number of workers is 0.04 which means that the number of employees in a business affects the average monthly revenue. A basic increase in the number of workers increases the average monthly revenue by Kshs 13,144.31.

The coefficient of determination is represented by adjusted R square. The value of adjusted R square is 0.237 meaning that there is a positive relation between rate of ICT adoption and average monthly revenue. In other words, an increase in the level of ICT adoption and increase in the number of workers leads to increase in the average monthly revenue. The adjusted R square is 0.237 and shows that there is 23.7% variation in average monthly revenue is as a result of changes in the rate of adoption of ICT and number of workers.

The regression equation will therefore be given as:

$$Y = -155695.084 + 7612.86 X_1 + 13,144.31 X_4$$

4.5 Barriers to ICT adoption

This section will discuss the findings to the barriers of ICT adoption for MSEs in Nairobi CBD.

4.5.1 High hardware cost

According to the study, 4.9% of the firm owners strongly disagreed, 17.6% disagreed, 24.5% were neutral, 38.2% agreed while 14.7% strongly agreed that high ICT hardware cost is a hindrance to ICT adoption. This is shown in table 4.6.1 below. This means that a huge percentage of the respondents agreed that hardware cost is a major factor in limiting ICT adoption in MSEs.

Table 4.5.1: High hardware cost

	Frequency	percentage
Strongly Disagree	5	4.9
Disagree	18	17.6
Neutral	25	24.5
Agree	39	38.2
Strongly Agree	15	14.7
Total	102	100.0

4.5.2 High software cost

The research finding showed that 2% of the firm owners strongly disagreed, 15.7% disagreed, 13.7% were neutral, 42.2% agreed and 26.5% strongly agreed that the high software cost limits ICT adoption in MSEs. Table 4.5.1 below shows this information.

Table 4.5.2: High software cost

	Frequency	percentage
Strongly Disagree	2	2.0
Disagree	16	15.7
Neutral	14	13.7
Agree	43	42.2
Strongly Agree	27	26.5
Total	102	100.0

4.5.3 High training and support cost

The study observed that 2% of the respondents strongly disagreed,15.7% disagreed, 20.6% neutral,42.2% agreed while 19.6% strongly agreed that high ICT training and support cost is a hindrance to ICT adoption. This is shown in table 4.5.3 below.

Table 4.5.3: High cost of training and support

	Frequency	Percentage
Strongly Disagree	2	2.0
Disagree	16	15.7
Neutral	21	20.6
Agree	43	42.2
Strongly Agree	20	19.6
Total	102	100.0

4.5.4 High internet costs

According to the research, 8.8% of the respondents strongly disagree,16.7% disagree,24.5% were neutral, 33.3 % agreed while 16.7 % strongly agreed that high internet cost limits ICT adoption in MSEs. Table 4.5.4 shows this information. This means that most of the firm owners agree that high internet cost is a major hindrance to ICT adoption.

Table 4.5.4: High internet costs

	Frequency	percentage
Strongly Disagree	9	8.8
Disagree	17	16.7
Neutral	25	24.5
Agree	34	33.3
Strongly Agree	17	16.7
Total	102	100.0

4.5.5 Difficulty in using ICT

The study showed that 17.6% of the respondents strongly disagree, 37.3% disagree, 24.5% were neutral, 15.7% agreed and 4.9% strongly agree that difficulty in using ICT is a limitation to adoption of ICT. The majority of the respondents agreed that ICT systems are easy to use, and this could be from the high level of education of the respondents. This is shown in table 4.5.5 below.

Table 4.5.5: Difficulty in using ICT

	Frequency	percentage
Strongly Disagree	18	17.6
Disagree	38	37.3
Neutral	25	24.5
Agree	16	15.7
Strongly Agree	5	4.9
Total	102	100.0

4.5.6 ICT system is unhelpful

In the question of whether ICT adoption is unhelpful to the business, 44.1% strongly disagreed, 34.3% disagreed, 5.9% were neutral, 7.8% agreed and 7.8% strongly agreed that ICT system is unhelpful to the business. This means that most business owners agreed strongly that adopting ICT system is useful and adds value to the business. This is shown in table 4.5.6 below.

Table 4.5.6: ICT system is unhelpful

	Frequent	Percentage
Strongly Disagree	45	44.1
Disagree	35	34.3
Neutral	6	5.9
Agree	8	7.8
Strongly Agree	8	7.8
Total	102	100.0

4.6.7 Time taken to study ICT

According to the study, 14.7% of the respondents strongly disagreed, 33.3% disagreed, 21.6% were neutral, 20.6% agreed and 9.8% strongly agreed that it takes a lot of time to study how to use ICT. The majority therefore agree that learning how to use ICT is not difficult and doesn't take much time. This is shown in table 4.5.7 below.

Table 4.5.7: Time taken to study ICT

	Frequent	Percentage
Strongly Disagree	15	14.7
Disagree	34	33.3
Neutral	22	21.6
Agree	21	20.6
Strongly Agree	10	9.8
Total	102	100.0

4.5.8 Frequent ICT changes

The study further shows that 2.9% of the respondents strongly disagree, 20.6% disagree, 22.5% are neutral, 37.5% agree and 16.7% strongly agree that frequent ICT changes limits ICT adoption in MSEs. The majority therefore agree that frequent ICT changes in terms of system upgrades discourages ICT adoption. This is shown in table 4.5.8 below.

Table 4.5.8: Frequent ICT changes

	Frequency	Percentage
Strongly Disagree	3	2.9
Disagree	21	20.6
Neutral	23	22.5
Agree	38	37.3
Strongly Agree	17	16.7
Total	102	100.0

4.5.9 Employees lack good ICT skills

The research study showed that 9.8% strongly agreed, 24.5% disagreed, 20% were neutral, 32.4% agree and 12.7% strongly agreed that most employees do not have good ICT skills. The majority agreed that most employees do not have the necessary ICT skills which limits the level of ICT adoption. This is shown in table 4.5.9 below.

Table 4.5.9: Poor ICT skills by employees

	Frequency	Percentage
Strongly	10	9.8
Disagree	25	24.5
Disagree	21	20.6
Agree	33	32.4
Strongly Agree	13	12.7
Total	102	100.0

4.5.10 Lack of government support

The study also sought to find out whether the government supports ICT adoption in MSEs. According to the study, 3.9% strongly disagreed, 27.5% disagreed, 21.6% were neutral, 35.3 % agreed while 11.8% strongly agreed about the lack of government support in supporting ICT adopting in MSEs. Most respondents agreed that the government doesn't support MSEs in adopting ICT. This is reflected in table 4.5.10 below.

Table 4.5.10: Lack of government support

	Frequency	Percentage
Strongly Disagree	4	3.9
Disagree	28	27.5
Neutral	22	21.6
Agree	36	35.3
Strongly Agree	12	11.8
Total	102	100.0

4.5.11 Poor technical support

The study further looked at the level of technical support from vendors. The study observed that 7.8% strongly disagreed, 18.6% disagreed, 24.5% neutral, 31.4% agreed while 17.6% strongly agreed that there is poor technical support. The majority agreed that there is poor technical support from the vendors which limit ICT adoption. This is tabulated in table 4.5.11 below.

Table 4.5.11: Poor technical support

	Frequency	Percentage
Strongly Disagree	8	7.8
Disagree	19	18.6
Neutral	25	24.5
Agree	32	31.4
Strongly Agree	18	17.6
Total	102	100.0

4.5.12 Customers lack ICT skills

The study also shows that 5.9% of the respondents strongly disagree, 14.7% disagree, 19.6% are neutral, 43.1% agree and 16.7% strongly agree that customers lack necessary ICT skills. The research shows that majority agree that customers do not have proper ICT skills which limit the level of ICT adoption. This is shown in table 4.5.12 below.

Table 4.5.12: Customers lack necessary ICT skills

	Frequency	Percentage
Strongly Disagree	6	5.9
Disagree	15	14.7
Neutral	20	19.6
Agree	44	43.1
Strongly Agree	17	16.7
Total	102	100.0

4.5.13 High cost of power

The study also aimed to find out whether the cost of power was high. From the study, 2.9% of the firm owners strongly agreed, 3.9% disagreed, 14.7% were neutral, 25.5% agreed and 52.9% strongly agreed that power costs are high. The majority strongly agreed that the cost of power was high which then limits the level of ICT adoption in MSEs. This is shown in table 4.5.13 below.

Table 4.5.13: High cost of power

	Frequency	Percentage
Strongly Disagree	3	2.9
Disagree	4	3.9
Neutral	15	14.7
Agree	26	25.5
Strongly Agree	54	52.9
Total	102	100.0

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter will discuss the conclusion of the research, summary, recommendations and proposals for further research.

5.2 Summary of the findings

The objective of the research was to establish the level of ICT adoption in MSEs in Nairobi CBD and find out whether ICT adoption affects performance of MSEs. The research was to further identify the barriers that limit the adoption of ICT in MSEs. To find out the level of ICT adoption, a five-level likert scale was used to establish the frequency of using common ICT tools. The research focused on the following ICT tools: Smart mobile phones, tablet devices, computers, fiscal/receipt printers, point of sale, social media, websites, Email applications, accounting system, inventory management system, payroll and human resources system and Microsoft office applications.

The study observed that 65.7% of the firm owners were male while 34.3% were female. This means that most of the MSEs in Nairobi CBD are owned by men. The research also found out that the majority of the respondents (41 out of 102 respondents) have university degrees. The analysis of the industry of the MSEs revealed that the majority (40.2%) of the MSEs are retail, followed by manufacturing (23.5%), service (20.6) and finally wholesale (15.7%).

The overall ICT adoption rate of 43 out of possible 60 points of always using the system is good. However, some of the ICT tools have very low such as inventory

management systems and payroll and human resources systems. This is consistent with the research by Ashrafi and Murtaza (2008) who observed low ICT adoption in their study on MSEs adoption of ICT in Oman. This may be caused by the high internet costs, high cost of power and expensive computer software and hardware.

The study further observes that there is a positive correlation between ICT adoption and MSE performance. The significance level in the regression analysis was 0.000 which showed a high significance level of ICT adoption on MSE performance. This means that firms that adopt ICT are more likely to increase their revenue than those that do not. This is why it is critical for firms to use ICT to improve their profitability and enhance their business growth. This observation is consistent with that of Ashrafi and Murtaza (2008) who observed that ICT adoption improves the firm's performance. The study further observes that there is a positive relation between the number of employees and the MSE performance. This means that firms that invested in more employees are more likely to increase their average monthly revenue.

Most of the business owners are well educated (graduate level) therefore appreciate the importance of ICT and take less time to learn how to use the systems. However, there are key barriers to ICT adoption such as lack of technical ICT skills, limited government support, high cost of computer and hardware that were also observed. These agree with the studies by Apulu and Latham (2011) in their studies on SMEs in Nigeria. The studies were also consistent with that of Ardjouman (2014) in his study on factors affecting ICT adoption of SMEs in Cote d'Ivoire who observed that the cost of power and poor infrastructure limits ICT adoption.

5.3 Conclusion

This study concludes that there is good ICT adoption in MSEs in Nairobi CBD. Some ICT tools such as smart mobile phones are more popular (64%) than other tools such

as tablets (27%). In addition, MSEs that have employees adopt more ICT tools such as payroll and human resources systems than those that have fewer employees. Furthermore, the study concludes that the adoption of ICT has a positive impact on the performance of MSE. Increased investment in ICT leads to increased performance of MSEs in Nairobi CBD. The study further observes that there is a positive relationship between the number of employees and the MSE performance. The MSEs that have more employees have higher average monthly revenue.

In addition, there are key barriers that limit ICT adoption among MSEs in Nairobi CBD. These include lack of technical ICT skills in employees, high internet costs, expensive electricity and high cost of computer software and hardware. The government has also not supported the MSEs to adopt ICT to run their businesses.

5.4 Recommendations

Micro and small enterprises should adopt ICT to increase profitability and improve efficiency. The MSE industry should encourage and support MSEs to adopt ICT through strategic partnerships with ICT software vendors.

The government of Kenya should support MSEs to adopt ICT adoption. The government should come up with a policy to incentivize the MSEs to adopt ICT. For instance, the government can lower taxes on ICT hardware and software, reduce internet costs and the cost of power.

The ICT vendors should simplify the ICT applications to make them more user friendly and easy to use. The ICT vendor should also provide simplified training and technical support. The ICT vendors should also minimise the number of system upgrades or have them structures in such a way that there is minimal disruption for the end users.

5.5 Suggestions for further research

The researcher would like to suggest the following areas: The scope of the research was limited to Nairobi central business district and the researcher would like to suggest that similar research should be conducted in a bigger scope to cover the whole of Nairobi county or even the entire country. The research was also limited to four industries; retail, wholesale, manufacturing and service industry. The researcher would like to propose a study for MSEs in all the industries.

The data was collected through questionnaires which limited the amount of information that the MSEs provided. The researcher suggests that further research be conducted through interviews to gather more information from the respondents using open ended questions. This will give respondents an opportunity to share more information.

The research focused on the financial performance of the MSEs. More studies need to be done on the other aspects of firm's performance such as customer service, innovation and staff performance. This would ensure there is a holistic view of the effects of ICT adoption on the performance of MSEs.

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APPENDIX 1: QUESTIONNAIRE

This questionnaire is part of the study done by Peter Mugo, an MBA student at the University of Nairobi. The research aims at studying the level of adoption of ICT and performance of MSEs in Nairobi CBD.

Please answer all questions to the best of your knowledge.

Section A: Background Information

1. What is your gender?

a) Male b) Female

2. How long has the business been in existence?.....Years

3. What is your age?.....Years

4. What is the highest level of education that you have attained?

- a) None
- b) Primary School
- c) Secondary School
- d) College Certificate
- e) College Diploma
- f) Degree
- g) Postgraduate

5. How many employees are employed on permanent basis?.....

6. What is the nature of your business?

- a) Retail
- b) Wholesale
- c) Manufacturing
- d) Service Industry
- e) Other

Section B: ICT Adoption

7. How often do you use the following ICT tools to run your business? (Please tick the appropriate box)

No	ICT Tools	Never	Rarely	Not sure	Often	Always
1.	Smart mobile phones					
2.	Tablet devices (iPad, Samsung tablets)					
3.	Computers (Desktop, laptop)					
4.	Fiscal (Receipt)Printer					
5.	Point of sale					
6.	Social media (Facebook, WhatsApp, twitter, Instagram)					
7.	Website					
8.	Email applications (Outlook, Gmail, yahoo)					
9.	Accounting System					
10.	Inventory management system					
11.	Payroll and Human Resource system					
12.	Microsoft office applications (word, excel, access)					

Section C: MSE Performance

Please fill in the blank spaces.

8. What is your average monthly revenue? Kshs.....

9. What is your average monthly net profit? Kshs.....

SECTION D: Barriers to ICT adoption

10. Please select the answer that best describes your experience on ICT adoption

No	ICT Barriers	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	The cost of computer hardware is high					
2	The cost of ICT software is high					
3	The cost of ICT training and support is high					
4	The internet costs are very high					
5	The ICT system is difficult to use					
6	The ICT system is not helpful to the business					

No	ICT Barriers	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
7.	It takes a lot of time to learn how to use the ICT system					
8.	The system changes in ICT happen very often					
9.	The employees do not have required ICT skills and knowledge					
10.	The government has not provided any support to ICT adoption.					
11	There is poor technical support from ICT vendors					
12	The customers do not have necessary ICT skills and knowledge					
13	The cost of power/electricity is very high					

THANK YOU