EFFECT OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTs) AS INNOVATION FACILITATORS OF SERVICE SECTOR SMEs IN NAIROBI COUNTY

BY

MOTURI JOAN NYABOKE

D66/77247/2015

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF SCIENCE IN ENTREPRENEURSHIP AND INNOVATIONS MANAGEMENT, SCHOOL OF BUSINESS, UNIVERSITY OF NAIROBI

NOVEMBER 2018

DECLARATION

This research project is my original work and has not been submitted for examination in any other University.

Signed …… **Date** ……..

Moturi Joan Nyaboke

D66/77247/2015

This research project is submitted for examination with my approval as the University Supervisor.

Signed …… **Date** ……..

Prof. Bitange Ndemo

Department of Business Administration

School of Business

University of Nairobi

ACKNOWLEDGEMENTS

I acknowledge my family for their support and encouragement throughout my studies.

I also acknowledge my supervisor Prof. Bitange Ndemo who guided me throughout the research period.

Finally, I thank the Almighty God for the gift of life and good health. Thank you for being with me all through.

DEDICATION

I dedicate this research to my family.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

DOI	Diffusion of Innovations Model
GDP	Gross Domestic Product
ICT	Information and Communication Technology
KES	Kenya Shilling
MIED	Ministry of Industrialization and Enterprise Development
MSMEs	Micro, Small and Medium Establishments
OECD	The Organisation for Economic Co-operation and Development
SMEs	Small and Medium Enterprises
TAM	Technology Acceptance Model
TOE	Technology-Organisation-Environment Framework
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UNCTAD	United Nations Conference on Trade and Development

ABSTRACT

This study focused on the Effect of Information and Communication Technologies (ICTs) as Innovation Facilitators of Service Sector SMEs in Nairobi County. The objectives of the study were to establish the extent of ICT adoption in Service Sector SMEs in Nairobi County and to determine the effect of ICT adoption on innovation by Service Sector SMEs in Nairobi County. A descriptive research design was adopted. The study targeted all Service Sector SMEs in Nairobi County and a sample of 100 Service Sector SMEs was chosen. Primary data was gathered from the owners and managers of the Service Sector SMEs using questionnaires. Data was analysed using descriptive statistics and regression analysis was used to establish the relationship between ICT adoption and innovation in the SMEs under study. The study found that a large number (94.62%) of these SMEs had adopted ICT tools and applications. The adoption of ICT in most (37.63%) SMEs was moderate with a few SMEs indicating low (17.2%) adoption. The study established that technological context, organizational context and environmental context have a positive effect on innovation in Service Sector SMEs in the County. Further, the study revealed that small and medium enterprises utilize the following ICT tools and applications in their operations; personal computers, email, internet, websites, intranet, credit card facilities, business software, and data storage and security facilities. Results also revealed that SMEs use ICT tools majorly for internal and external communication with customers, suppliers and employees; sharing files/information; tracking orders, supplies and customer enquiries; financial accounting; and carrying out internet banking. The study concludes that most SMEs use ICTs mainly to support changes in the business model. Based on the findings of this research, it is recommendable that the Service Sector SMEs adopt ICTs in their business operations. However, in adopting these uses a cost-benefit analysis needs to be carried out to ensure that the SMEs' primary objective of making profit is not overshadowed. This research was a descriptive survey and was also limited by the use of questionnaires as the only research instrument. A case study is therefore recommended for an extensive study on the research variables, possibly on the subject of ICT utilization using additional research tools like interviews as well as focus group discussions.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Information and Communication Technologies (ICTs) are essential elements for success in commerce when considering today's markets. The current knowledge-based society requires intensive use of ICTs for firms to develop competitive advantages (Barba et al., 2007). This is more than ever important for Small and Medium Enterprises (SMEs) since their survival depends upon their ability to create new models for their enterprise, attain competitive advantage in new markets, or improve communication both internally and externally (Barba et al., 2007). Adoption of ICTs by organizations provides benefits such as: access to information, competitive advantage by merging supply chain allies and inter-organizational functions, improved sales, and cost reductions (Ghobakhloo et al., 2012).

The benefits derived from ICT adoption usually lead to higher levels of innovation as ICT adoption has been found to have a positive relationship with knowledge creation (Fu and Hou, 2015). Innovation is the key driver of change in modern enterprises as it leads to the realization of new ideas, formation of dynamic products, or the upgrading of existing services. ICT adoption can open up geographic boundaries and expose firms to a global pool of knowledge. Developing countries should therefore strive to improve their local innovative environment in order to provide opportunities for domestic firms to access the international stock of knowledge and to strengthen the interaction of ICT practices and innovation activities that foster knowledge creation (Fu and Hou, 2015).

ICTs offer organizations, especially SMEs, the opportunity to improve their day-to-day activities by adopting the available tools. ICT use generates higher market share through reduction of input costs and allows firms to produce more products or to improve product quality which in turn leads to improved sales volumes, improved productivity, and higher profits for SMEs (UNCTAD, 2008). ICTs can also aid SMEs in reducing their costs and improving their core business processes, thus gaining competitive advantage (Apulu and Latham, 2010). Further, ICTs increase SME competitiveness through the establishment of adaptable connections with trade partners as a result of quick and more dependable communication (Matambalya and Wolf, 2001). SMEs should therefore be encouraged to exploit ICTs to improve flow

of information and communication, for market identification, to enhance innovation of quality products and product promotion, to improve the process of transacting, to aid in market research and analysis, for on-line selling, for networking, to access international markets, and to lower transaction costs (Kiveu and Ofafa, 2013).

1.1.1 Information and Communication Technology (ICT)

Ashrafi and Murtaza (2008) define ICT as the recording, processing and conveying of information using electronic means. According to Ritchie and Brindley (2005), ICTs are the tools used for collecting, organizing, storing, processing and communicating information within an organization. ICT tools cover technology such as desktop computers, laptops, mobile phones, the internet, wired or wireless intranet, credit card facilities, business software, network security, and data storage and security. ICTs are constantly evolving around the world and are important in business in the areas of production, business methods, advertising, trade, communication and consumer patterns (Kiveu and Ofafa, 2013).

ICT adoption is defined as a willingness to take up new innovations that relate to computers and the internet (Rodgers, 1995). Agboh (2015) defines ICT adoption as the application of business software by an organization in order to improve information and knowledge management as well business processes and productivity. ICT adoption is important as it gives firms the competitive advantage necessary for success (Barba et al., 2007). ICT has led to the transformation of business through reduction of transaction costs, reduction of communication costs and provision of wide and cheap access to information, knowledge and services (Sahlfeld, 2007). Studies conducted have discovered that adoption of ICTs by SMEs is influenced by factors like: competitive pressures, support by senior management and the organization's size (Premkumar, 2003); compatibility, relative advantage, complexity, senior management attitudes, pressure from competitors, pressure from trading allies, knowledge and expertise, and external change agents (Teo et al., 2004); and external information sources, senior management support, information system unit professionalism, and external pressure (Jeyaraj et al., 2006). This study looked at the Technology-Organisation-Environment (TOE) Framework of ICT adoption which describes the components affecting the technology adoption decision by firms. According to TOE model technological context, organizational context, and

environmental context all influence adoption of innovation (Oliveira and Martins, 2010).

Today, small and medium and large enterprises, recognize the opportunities and benefits that ICTs offer in terms of competitive positioning and increased productivity (Olise et al., 2014). Other benefits of ICT adoption include improved management of information and knowledge, reduced costs of transacting, increase in the rate and dependability of transactions, improvement in communication, improved quality of services for customers, enhanced productivity, embracing of new organizational and managerial models, gaining access to new markets and new business models, and improved efficiency of the human resources (Barba et al., 2007).

1.1.2 Innovation

Innovation is a continual process of transforming know-how and ideas into new products, systems and processes so as to profit an organization and its shareholders (Popa et al., 2010). Innovative organizations are those that dispense the necessary resources and have an organizational culture that allows and encourages generation of new ideas (Popa et al., 2010). According to Joseph Schumpeter, innovation involves coming up with novel products, processes, marketing methods, sources of supply for raw materials, or organizational structures (Rogers, 1998). Drucker (1985) describes innovation as a tool that entrepreneurs use to exploit opportunities. He further states that innovation is a function of entrepreneurship as it leads the entrepreneur either into creating new resources or enhancing existing ones. Whereas entrepreneurship is concerned with recognizing and taking advantage of an opportunity in order to provide goods and services within the structures of the existing company or by formation of a new company, innovation is concerned with applying new inventions (Naudé et al., 2011).

Innovation is a key determinant of organizational growth, business success and sustainable competitive advantage (Lin and Chen, 2007). Innovation is an important influencer of firms' competitiveness and business success (Szirmai et al., 2011). Firms today are facing great pressure to continuously innovate in order to survive and grow (Lin and Chen, 2007). Innovation leads to economic change, technological upgrading and value addition in firms' activities (Szirmai et al., 2011). As stated by Szirmai et al. (2011), the factors promoting and/or hindering innovation include: the entrepreneur's degree of education and experience, company size and age, the

prevailing organizational culture, market conditions, government policies and regulations, and the firm's external environment.

Innovative activity can be measured using input and output activities as identified by Rogers (1998). Input measures include expenditure on research and development, intellectual property, capital expenditure, expenditure on marketing, expenditure on training as a result of introducing products or processes that are new or significantly improved, and changes in management methods and organizational structure of the firm. Output measures include the firms' performance as represented by growth in profits, growth in revenues and improved productivity, and the number of novel or significantly enhanced products or processes that have been introduced (Rogers, 1998).

1.1.3 Small and Medium Enterprises (SMEs) in Kenya

Small and Medium Enterprises (SMEs) are core pillars of economic activity in Kenya and they contribute an estimated 25% to Gross Domestic Product (GDP) (Ministry of Industrialization and Enterprise Development (MIED), 2015). The SME sector is the fastest growing business segment in Kenya and employs about 85% of the Kenyan workforce. SMEs are an avenue for job creation, income generation, government revenue and poverty reduction (Kiveu and Ofafa, 2013). Further, the sector is a major source of goods and services, provides opportunities for technological development, and promotes competition, innovation and enterprise culture (Kiveu and Ofafa, 2013). SMEs contribute to economy-wide efficiency, innovation and productivity as they enhance entrepreneurship and competition (Beck et al., 2005). The sector has been identified as a key stimulator of growth and achievement of development as highlighted in Kenya's Vision 2030 (Kenya National Bureau of Statistics, 2016). According to the Micro, Small and Medium Establishment (MSME) survey of 2016, the MSME sector yields increases in developing skilled and semi-skilled labour and production of goods and services, thereby acting as a base for future growth in industries (Kenya National Bureau of Statistics, 2016).

Globally, SMEs are defined using one of three dimensions: turnover, employee numbers, or the size of balance sheet, with differences arising from the limits each country imposes on the dimensions (Katua, 2014). SMEs in Kenya are described using the following dimensions: capital invested, annual turnover/revenue and number of employees. The Micro and Small Enterprises Act of 2012 (Republic of Kenya,

2012) defines micro enterprises as businesses with an investment of less than KES 5 million, an annual turnover of below KES 500,000 and 1-9 employees. A small enterprise is a company employing 10-50 workers, produces revenues of KES 500,000-KES 5 million annually and has invested more than KES 5 million in its capital. Medium enterprises have employees numbering more than 50 but fewer than 100, and an annual revenue of between KES 5 million-KES 800 million.

The SME sector in Kenya encounters high failure rates with past data showing that for every five SMEs established, three collapsed after the first few months of operating (Bowen et al., 2009). The challenges faced by the sector include: competition from both similar sized companies and from large firms, limited access to funding, availability of cheap imports, insecurity, and difficulty in debt collection (Bowen et al., 2009). Ong'olo and Awino (2013) identified the challenges encountered by SMEs in Kenya as institutional and regulatory and these relate to poor organization of tasks, poor enforcement of regulatory legislations, insufficient exchange of ideas between the private and public sector at county level, and inadequate knowledge on policies set by the national and county governments. Mwai (2016) identified challenges that hinder growth and profitability of SMEs as poor infrastructure, lack of access to credit facilities, frequent technological changes and insufficient market information.

1.1.4 Service Sector SMEs in Nairobi County

SMEs transcend every sector of the economy as they are involved in activities like wholesale and retail trade, services, agriculture, and manufacturing (Kiprotich, 2014). In Nairobi County, SMEs are classified under manufacturing, transport and communication, wholesale and retail trade, construction, and service provision (Kenya National Bureau of Statistics, 2016). The focus of this study was on the service sector SMEs. Services can be categorized on the basis of trade in services and national accounts. National accounts services include: wholesale and retail trade, information and communication, professional and support services, accommodation and restaurants, health, education, finance and insurance, public administration, real estate, and transport and storage (Khana et al., 2016). Trade in services are: communication, business services, financial services, transport, construction and engineering, health-related and social services, environmental, travel, education, cultural and sporting, recreational services, distributional services, and other services (Khana et al., 2016). The services sector is made up of organizations in various

industries including warehousing and transportation; information technology; commodities; securities and investments; health care and social assistance; professional, scientific and technical services; waste management; and arts, recreation and entertainment services (Khana et al., 2016).

The services sector serves an important role in the economy for both developed and developing countries as they make a direct and considerable input to GDP and job creation (Khana et al., 2016). According to Khana et al. (2016) some services provide key inputs in the economy resulting in notable effects on the overall investment climate as well as economic growth and development, while services like health, water, education and sanitation are pertinent to attainment of social advancement. The Organisation for Economic Co-operation and Development (OECD, 2000) established that most SME jobs are service sector, concentrating mainly in wholesale and retail trade, hotels and restaurants, construction, business services, and communications. In addition, there is increasing presence of SMEs in technology-focused industries like biotechnology and information and communication technologies (ICTs); and the strategic business services sub-sector comprising of human resource development, computer software and information processing, business organization, research and development, and marketing (OECD, 2000). Hempell et al. (2004) established that ICT adoption has progressed most in the service sector and business-related services are key to economic growth for industrialized countries. Research by the Kenya National Bureau of Statistics (2016) suggests that Kenyan SMEs are active in trade, services and manufacturing. The research further defines services as the provision of manual or intellectual services.

The Kenya National Bureau of Statistics (2016) reports that nearly half of all MSMEs in Kenya are located in the capital city, that is Nairobi County, and within a 100 km radius. This can be attributed to the county's strategic location which attracts residents, workers and investors as well as physical, social and economic features that provide opportunities for socio-economic development (County Annual Development Plan, 2016). Nairobi County has approximately 268,100 licensed and 782,500 unlicensed SMEs with 20.3% in manufacturing, 2.6% in construction, 59.8% in wholesale and retail trade, 3.1% in transport and communication, and 9.7% in service provision (Kenya National Bureau of Statistics, 2016). The remaining 4.5% of SMEs are engaged in other activities. It can therefore be deduced that Nairobi County has a

total of 1,050,600 SMEs with approximately 101,908 service sector SMEs. According to Nabintu (2013) the performance of SMEs in Nairobi County is affected by availability of business information, availability of funding, technology in payment systems, and management experience. In addition, Njenga (2015) states that SMEs in Nairobi County face high competitive and customer pressures which has forced them to be innovative and has led to tailor-made products and services and the growth and creation of new markets. Irungu and Arasa (2017) conducted a study with the goal of discovering the factors that would influence competitiveness of SMEs in Nairobi and concluded that sustainable competitive advantage arises from effective strategic leadership, technology adoption, resources availability, and an effective organization culture. SMEs should therefore strive to embrace strategic leadership practices, benchmark on best practices, adopt appropriate technology, ensure optimal utilization of resources, and cultivate a balance between the organization culture and the organization processes so as to boost competitive advantage and remain relevant in their markets (Irungu & Arasa, 2017).

1.2 Research Problem

Organizations worldwide are shaped by ICT (Apulu and Latham, 2010). ICT is an enabler of modern business and has been found to be vital for the continued existence and development of economies and industries (Berisha-Namani, 2009). SMEs can utilize the benefits of ICTs in cutting costs, improving links with customers, as a tool for innovation and creating a market niche (Kutlu and Özturan, 2008). In addition, Chibelushi (2008) states that adoption of ICTs can lead to business transformation and the ability to conduct business across geographical boundaries. ICT adoption also offers other benefits such as improved efficiency of transacting as a result of fast and precise handling of information (Ion & Andreea, 2008), enhancing a business' competitive advantage, opportunities for networking, vertical integration, creation of a facilitative environment, and establishment of internal competencies to enable organizations capture market opportunities (Swift, 2009). Ongori (2009) reports that, SMEs need to seek ways to enhance their competitiveness and their ability to respond to a dynamic market. For this reason, ICT adoption is of importance as it helps change the way businesses operate by modifying business structures and enhancing competition, and creates competitive advantage for companies by transforming business operations. As SMEs play an increasingly important role in the country's economy, they should be encouraged to adopt new technologies faster and create additional innovative and competitive products (Barba et al., 2007).

The SME sector in Kenya is at present receiving a great deal of recognition from government because it has been identified as a way out of the issue of youth unemployment. SMEs promote economic growth by driving innovation of products and services (Ong'olo & Awino, 2013). Using ICT as well as applying innovative work methods is beneficial to performance. These benefits may be direct or indirect and short or long- term. Kenya is the hub of innovation in East Africa and leads in providing support to SME development (Brethenoux & Mulder, 2015). According to Ewing et al. (2011), Kenya has highly developed ICT and mobile sectors which have grown by an average of 20% annually over a period of 10 years. Okadapau et al. (2016) have found that SMEs in developed countries are fast recognizing the benefits of ICTs in their operations. However, SMEs in many of the developing countries, including Kenya, are adopting and using ICTs in their business operations at a slow rate. The slow uptake is attributed to perceived customer readiness, high

implementation costs, security, and lack of expertise in ICT (Emma and Georgia, 2009). ICT adoption is mainly found in the large corporations, where cloud computing, data storage, and software development services are implemented (Ewing et al., 2011). To ensure sustainable competitive advantage and viability, SMEs in developing countries need support in adopting ICTs for them to provide innovative solutions that address unmet needs in the market (Ewing et al., 2011).

Previous studies carried out have had their main focus on ICT adoption in developed countries. Scupola (2009) carried out a study that aimed to establish the factors affecting adoption of e-commerce by SMEs in Denmark and Australia. The study revealed that environmental influences like customer pressures, as well as access to and the quality of available consulting services were major elements. Sin Tan et al. (2009) carried out a study that researched on the benefits, barriers and characteristics that influenced SMEs in Malaysia's Southern Region to adopt internet-based ICTs. The research concluded that ICT adoption yields the benefits of low cost and effective communication, but security and cost present barriers to adoption. Ashrafi and Murtaza (2008) conducted a study on SMEs in Oman to determine how they use ICTs and the impact. The findings affirmed earlier studies conducted as they revealed that SMEs realized good performance as well as other benefits due to the adoption and utilization of ICTs in their business activities. However, these SMEs faced challenges such as high cost of ICT, lack of internal competences, and inadequate information on appropriate ICT solutions and their implementation.

For developing countries, focus has been on a few African countries including Nigeria, South Africa and Ghana. Apulu and Latham (2010) reviewed the benefits of ICT adoption by SMEs and identified the problems that Nigerian SMEs face. The findings revealed that ICTs offer SMEs competitive advantage. The challenges encountered by Nigerian SMEs in view of adoption of ICTs included poor infrastructure, lack of electricity, and inadequate financial and human capital. Olise et al. (2014) investigated the relationship between adoption of ICT and SME performance improvement in the Anambra State of Nigeria. The study revealed a significant difference in patterns of awareness and adoption among the SMEs. Further, capital base, turnover, and asset value of the firms studied were found to affect the adoption of ICT. SME performance was however found to be impacted by business experience as well as the owners' capital input and marital status. Boohene et

al. (2015) explored ICT usage by SMEs in Accra Ghana so as to identify the ICT tools, driving factors for SME adoption, the benefits of ICT adoption for SMEs and the challenges that SMEs face in adopting ICT. The study established a positive connection in usage of ICT and volume of sales, profitability and the firm's market share and recommended the involvement of policy-makers and the other business development service-providers in educating SME owners of the positive effects on firm growth of ICT usage. Ismail et al. (2011) researched on SMEs in South Africa with the aim to investigate how ICT is used to add value to the sector, with the findings revealing that most SME owners experienced benefits such as improved marketability, increased customer satisfaction, better services in terms of quality, faster turnaround time, and efficient and effective business methods.

In Kenya, Matambalya and Wolf (2001) conducted a study that aimed to ascertain the role that ICTs play in SME performance and found no major connection between investment in ICT and productivity. Mutua and Wasike (2009) focused on the effect that ICT adoption has on SME performance, with the study concluding that ICT adoption improves SME productivity and competitiveness as access to ICT is significantly correlated with higher output. Most of the studies carried out in Kenya had focused on ICT adoption and SME performance. Therefore, there was need to conduct research with focus on ICT adoption and SME innovation. This research aimed to fill this gap by addressing the following questions: What is the extent of ICT adoption in Service Sector SMEs in Nairobi County? What is the effect of ICT adoption on innovation by Service Sector SMEs in Nairobi County?

1.3 Research Objectives

The objectives of this research were as follows:

1. To establish the extent of ICT adoption in Service Sector SMEs in Nairobi County.
2. To determine the effect of ICT adoption on innovation by Service Sector SMEs in Nairobi County.

1.4 Value of the Study

This study will be of benefit policy-makers in general, Government, SME owners and technology-based companies who are all interested in proof that ICTs play an important role in innovation for SMEs. It provides justification of the need for Government to establish better policies that promote ICT adoption and assimilation by SMEs, to build more ICT related infrastructure that foster the growth of SMEs and to provide training opportunities that help SMEs in developing the necessary ICT skills.

Secondly, the study will educate SME owners about the potential gains available in adopting the cost-effective capabilities of ICT. In addition, the study assists technology-based companies as they develop ICT solutions that benefit SMEs in developing countries.

Finally, the findings of the research contribute to a growing body of knowledge in ICT adoption by testing a well-known ICT adoption model, the Technology-Organisation-Environment Framework.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Chapter two looks at the literature that informed this study. It mainly reviews the theoretical and empirical studies that have been carried out on ICT adoption and innovation.

2.2 Theoretical Framework

The following theories were considered in a bid to explain the factors influencing the adoption of technology.

2.2.1 Diffusion of Innovation Model

The Diffusion of Innovation (DOI) model was introduced by Everett Rogers in 1962 (Rogers, 1995; Oliveira & Martins, 2010). Diffusion is the process of conveying innovation for a period of time to members of a society using certain channels. Rogers (1995) describes the series of phases through which an individual goes through in technology adoption. These are: the knowledge phase, persuasion phase, decision phase, implementation phase, and confirmation phase. Notions on the technology's characteristics like compatibility, its relative advantage, complexity, observability, and trialability impact the adoption process.

The knowledge phase is characterized by an individual learning about the existence of new technology and seeking information about it. At persuasion phase, the individual creates a negative or positive attitude towards the new technology, but such attitude does not always result in acceptance or rejection of the new technology. During the decision phase, the person chooses whether to take up and fully utilize the new innovation or to decline it. Implementation involves putting the new technology into practice, while at confirmation phase the individual seeks approval for his/her decision (Oliveira & Martins, 2010). For the DOI model the individual, the structure of the organization and a firm's external characteristics are important backgrounds to innovation (Oliveira & Martins, 2010).

2.2.2 Technology, Organization and Environment Framework

Tornatzky and Fleischer introduced the Technology-Organization-Environment Framework in 1990 (Oliveira & Martins, 2010). In this model, an enterprise is influenced by three aspects when adopting and implementing technology; the technology context, organization context, and environment context. The technology

background is concerned with characteristics such availability, complexity and compatibility. The organization background looks at the organization's size, scope, financial resources, and management support. The environment background studies the area where the firm carries out business that is; government, industry, and competition.

2.2.3 Unified Model of Acceptance and Use of Technology

Unified Model of Acceptance and Use of Technology was developed by Venkatesh et al. (2003) and seeks to explain technology acceptance by an individual (Thomas et al., 2013). The model consolidates eight other models on technology adoption which include Technology Acceptance Model (TAM), Theory of Planned Behaviour (TPB), Theory of Reasoned Action (TRA), the Motivational Model, Model of Personal Computer Use, combined Theory of Planned Behavior and Technology Acceptance Model, Diffusion of Innovation Theory, and Social Cognitive Theory (Venkatesh et al., 2003). In applying the model, the variables that determine user intention and behavior include expected performance, expected effort, facilitating conditions and the social factors. These variables are then regulated by gender, experience, age, and voluntary use (Venkatesh et al., 2003).

Performance expectancy presents the belief that utilising the technology leads to performance gain, effort expectancy relates to the ease in using technologies, social factors relate to those people important to the individual influencing their decision to adopt technology, and the facilitating conditions focus on the organizational and the technical infrastructure necessary to maintain the technologies (Venkatesh et al., 2003). Venkatesh et al. (2003) state that performance expectancy, effort expectancy and social factors control intention while facilitating conditions control usage.

2.3 Types of Innovation

The Organisation for Economic Co-operation and Development (OECD) identified four innovation types in the 2005 Oslo Manual. These are product, process, marketing, and organizational. Innovation of products involves introducing a good or service which is novel or improved notably; developing new applications for an existing product after minor changes; changing the components of a product in order to enhance performance; the addition of new functions or new characteristics to services that exist; and the introduction of new services (OECD, 2005). Innovating a process involves using new production or delivery techniques, equipment or software

that are new or significantly improved; automation of production methods; upgrading of systems and software; and the implementation of ICT to improve efficiency (OECD, 2005). The basis of marketing innovation involves implementation of new methods in marketing; making design or packaging changes that are significant to a product; making significant changes to the distribution strategy; and making significant changes to the promotion strategy and/or the product's price (OECD, 2005). Organizational innovation occurs when a firm implements new business practices; makes changes to significantly improve the organization's structure or external relations; and introduces new organizational routines, procedures and conduct of work (OECD, 2005).

Damanpour (1991) classifies innovation in three pairs: administrative innovation-technical innovation, radical innovation-incremental innovation, and process innovation-product innovation. Administrative innovation is concerned with an organization's structures, administrative processes, and the management of activities. Its main characteristics are low-level professionalism, high formalization and high centralization (Damanpour, 1991). Technical innovation centres on products, services and technologies in the production cycle, and is characterized by low centralization, low formalization and high-level professionalism (Damanpour, 1991). Process innovation occurs when new components are introduced in an organization's processes at various stages of development (Damanpour, 1991). Product innovations are seen when an organization introduces new products or services in response to market needs (Damanpour, 1991). Radical innovations are characterized by critical changes to the product, the process or a combination of product and process (Damanpour, 1991). Incremental innovation is characterized by slight improvement in an organization's products, services or existing processes (Damanpour, 1991).

Researchers Henderson and Clark (1990) as well as Jin et al. (2004) further identified other types of innovation. Henderson and Clark (1990) identified architectural innovation, which involves changes in a product's design without influencing its components. The idea behind architectural innovation is that the components of the existing system are reconfigured and integrated in a new way to form a logical new product (Henderson and Clark, 1990). Jin et al. (2004) classified innovation into creative-adoptive innovation. In creative innovation an organization develops new products or services using its existing systems whereas in adoptive innovation the

organization uses new external ideas to implement change (Jin et al., 2004). Adoptive innovation is used when an organization seeks to develop new strategies, create a new company image or establish new organizational structures (Jin et al., 2004).

2.4 Aspects of ICT Adoption

The aspects of ICT adoption are derived from the contexts of the TOE model advanced by Tornatzky & Fleischer (1990). The technology context looks at availability, complexity and compatibility of internal and external technology; the organization context looks at the size, scope, financial resources and senior management support; and the environment context centres on industry, competitors and government support (Lippert & Govindarajulu, 2006).

Availability of technology studies both the internal technologies adopted by a business and the external technologies available in the market (Leung et al., 2015). A firm's internal technologies are important as they broaden the firm's scope and rate of technological change, while external technologies provide opportunities for evolution and adaptation of innovation (Baker, 2012). Complexity is the perception that the new innovation is tough or easy to comprehend and use, as this affects the technical skills required to adopt it (Cooper & Zmud, 1990). Complexity can negatively impact adoption as it hampers the successful implementation of new technology (Premkumar & Roberts, 1999). Compatibility is concerned with consistency of the new technology or innovation with the adopting firm's values, needs, and practices (Rogers, 1995). Adoption of the new innovation may yield notable changes in work processes therefore compatibility becomes an important feature in innovation adoption (Rogers, 1995). Zhu et al. (2006) in their research of European enterprises concluded that compatibility is a major influencing factor when it comes to the adoption of digital transformation technology. In Malaysia, Sin Tan et al. (2009) concluded that observability, relative advantage, complexity, and compatibility were main influencers of ICT adoption by SMEs. Alshamaila et al. (2013) researched on cloud computing adoption by SMEs in the North East of England and found that complexity, relative advantage, compatibility, and trialability contribute most to technology adoption.

In the organizational context, large organizations have an upper hand as they usually have the financial resources to implement new innovations as compared to smaller firms (Premkumar & Roberts, 1999). In terms of scope, businesses covering a larger

area opt for e-commerce for cost reduction for the organization and the customer (Bakos, 1998) as well as manage inventory more easily (Chopra & Meindl, 2001). Firms with larger business scope also benefit from web connectivity and sharing of knowledge which may aid customers in finding their stores (Khana et al., 2016). An organization with top management that values and promotes innovation provides a conducive environment and adequate resources for new technology adoption (Teo et al., 2004). Management decisions are an important feature in adoption of innovation as they impact on organizational growth and development as well as greatly influencing strategic decisions (Carpenter et al., 2004). Support from senior management is the most significant factor influencing adoption of innovation by enterprises in the organizational context. This is highlighted in Low et al. (2011) where it was concluded that support from senior executives within a company is a notable influence in adopting cloud computing. In addition, Lin (2014) concluded that the adoption of supply chain management systems was enhanced by, among other factors, management support.

In the environmental context, industry players stimulate innovation through relations with the firm that may affect processes and/or require new combinations (Van der Sijde et al., 2012). Industry life cycle can stimulate innovation as superior firms in the value trail impact other firms to innovate (Baker, 2012). When considering government support, firms have to ensure that the innovations they use are according to the rules and standards set by the government or its agencies (Van der Sijde et al., 2012). Government support environment can also have a positive and negative effect on innovation as industry constraints imposed by government can promote innovation by affected firms, whereas stringent safety and testing requirements may retard innovation (Baker, 2012). Competitive pressures stem from competitors and the need to take on novel technology so as to avoid competitive plunge (Zhu et al., 2003). Premkumar and Roberts (1999) revealed that competitive pressure was a key determinant of technology adoption in small businesses. Li (2008) found that competitive pressures and government support significantly influenced the adoption of e-procurement by firms in the manufacturing sector. Teo et al. (2009) concluded that industry significantly affects e-procurement adoption. Stockdale and Standing (2006) concluded that key industry players are the major influencing factors in e-commerce adoption by SMEs.

2.5 ICT Adoption and Innovation

Today's business environment makes the adoption of ICT an essential element for the survival of SMEs (Barba et al., 2007). For firms, ICT enables innovation through information capturing and organisation as well as knowledge processing (Fabritz, 2015). Brynjolfsson and Hitt (2000) revealed that application of ICT is tied to organizational transformation such as flatter hierarchies, improved communication channels, and the reorganization of responsibilities. Koellinger (2005) found that ICT enables innovation by opening up new markets and new ways of doing business thereby reducing geographical barriers. For Gretton et al. (2004), ICT enables innovation by providing more efficient communication between firms, with clients, and by creating linkages with trade associates and this may result in the establishment of new products and processes. SMEs are better able to adopt technological innovations because of their flexibility, especially with regard to their organizational structures. However, they face challenges like limited finances and lack of/limited required technical and managerial skills (Shiu & Walker, 2007). Pullen et al. (2009) established that focusing on incremental innovation led to higher overall innovative performance. Huarng and Hui-Kuang Yu (2011) identified stakeholders, funding, and legitimacy as the three main elements for successful entrepreneurial experiences of SMEs in Taiwan and found that the innovation process brings about intangible and tangible value.

Matthews (2007) identified and classified the challenges that prevent ICT adoption as financial (inability to invest), infrastructural (slow and unreliable internet, high connection costs, and unreliable and expensive power supply) and organizational (low levels of ICT literacy, organizations' inability to adapt to new operational models and a lack of experience in integrating ICT). In Malaysia, Alam and Noor (2009) identified three significant factors that impact the use of ICT as knowledge on ICT, support from government, and the benefits perceived to be derived. In South Africa, the key hindrance to ICT adoption is a lack of awareness. Other barriers include: lack of vendors to accommodate SMEs, owners' lack of knowledge on available technology and its suppliers, and the perception of ICT being too expensive (Ismail et al., 2011). The rationale behind the limited use of ICT by SMEs in Nigeria as reported by Apulu and Ige (2011) includes electricity and infrastructural inadequacies. In Ghana, many SMEs are reluctant to use ICT as they see it as a cost centre rather than

a tool that can enhance organizational growth (Boohene et al., 2015). Other reasons for low rate of ICT adoption in Ghana include limited funding, insufficient awareness/knowledge, inadequate skills among staff, and perception of lack of applicability of ICT to the company. In Kenya, Nduati et al. (2015) concluded that ICT adoption by SMEs is hindered by low levels of ICT skills, high price of computer software and other ICT tools, lack of administrative support, lack of managerial skills in ICT and the high cost of networks and internet.

2.6 Conceptual Framework

The conceptual framework can be presented in either graphical or narrative form and it highlights the main elements to be studied (key factors, variables or concepts) as well as the supposed relationship between them (Miles & Huberman, 1984). In this study, innovation is the dependent variable whereas aspects of ICT adoption are the independent variables.

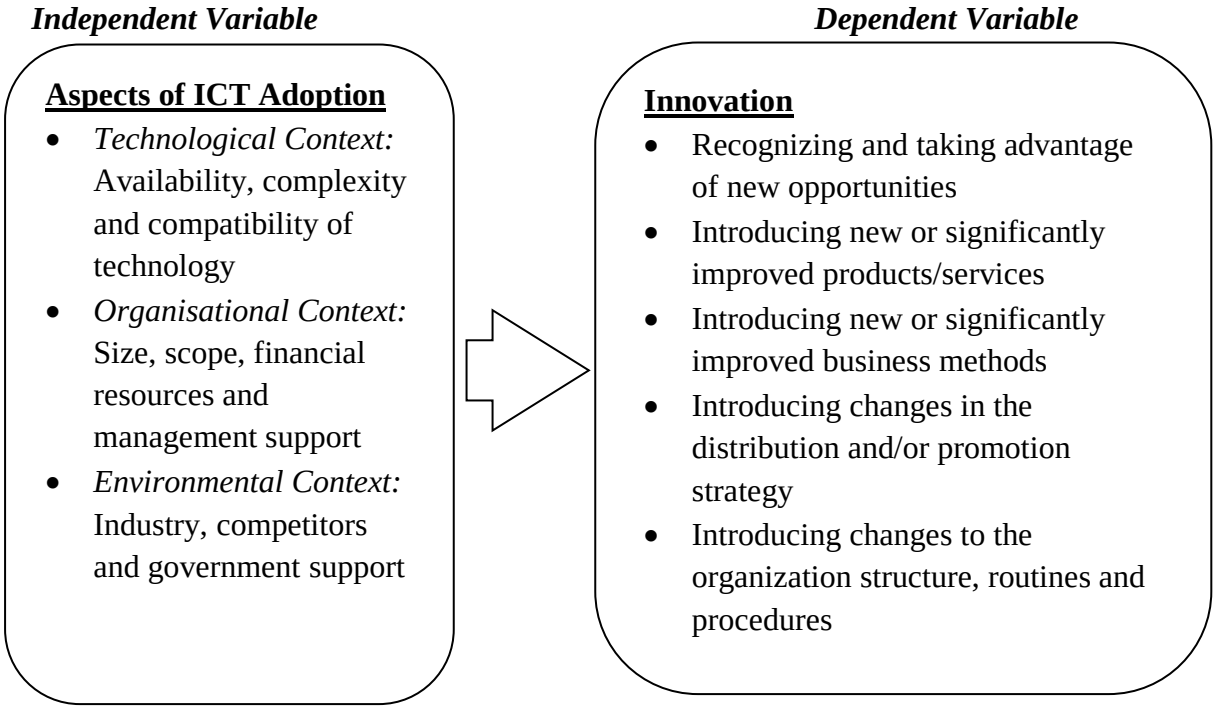

Figure 2.1 Conceptual Framework (Source: Author, 2018)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research Design

Descriptive research was applied to get information on the current state of the variables under study as well as to define what exists as regards those variables. Descriptive research provided answers on who, what, when, where and how as relates to the research problem (Maxwell, 2008). Descriptive research was suitable for this study as it determines the relationship between the independent and dependent variables. Descriptive surveys can be used when testing a variety of issues, populations and programmes, so as to be able to generalize the features and findings (Cohen et al., 2004). The method offers a simple and straightforward study of attitudes, values, beliefs and motives (Cohen et al., 2004). A cross-sectional survey was also utilised to measure the state of variables at a particular point in time or in a short period. The benefit of cross-sectional survey is that it allows the researcher to compare a number of different variables at the same time. It was appropriate for this study as it allowed the selection of a sample based on existing differences and from which a clear snapshot of the outcome was established.

3.2 Target Population

The population of study was all Service Sector SMEs in Nairobi County. This was a population of approximately 101,908 (Kenya National Bureau of Statistics, 2016).

3.3 Sample Design

For this study, simple random sampling was used to identify the sample size. Random sampling provides an equal chance for each population member to be selected. Israel (1992) developed the published tables as a way of determining sample size for given combinations of precision, confidence levels, and variability. This study assumed a 10% precision level or margin of error, 95% confidence level and 50% response distribution to get a sample size of 100 respondents.

3.4 Data Collection

Primary data was gathered from the respondents using questionnaires as they were appropriate in collecting large amounts of data within short time periods. Target respondents were the owners and/or managers of the SMEs under study. Trained research assistants were used in the data collection process. The questionnaire was designed such that it captured the relevant information necessary to answer the research questions: What is the extent of ICT adoption in Service Sector SMEs in

Nairobi County? What is the effect of ICT adoption on innovation by Service Sector SMEs in Nairobi County? The independent variables of the conceptual framework formed the key elements of the questionnaire.

3.5 Data Analysis

A variety of statistical procedures was used in the analysis of data. These included basic descriptive statistics and regression analysis between the study variables. Descriptive statistics used frequency distributions, mean and standard deviation to give an understanding of the characteristics of the data and to describe the respondents in the sample. Regression analysis was used in investigating relationships between variables. The magnitude of the effect of dependent variables on the independent variable was studied using regression analysis. Regression analysis was used to establish the relationship between ICT adoption and innovation in Service Sector SMEs in Nairobi County.

The regression formula used was as follows:

$Y= \beta_0 + \beta_1 TC + \beta_2 OC + \beta_3 EC + \varepsilon$

Where:

Y = Innovation

TC = Technological Context

OC = Organisational Context

EC = Environmental Context

β_0 = Constant variable

ε = error/term or variable. This represents all factors affecting the dependent variable that were not included in the model as they are difficult to measure or are unknown

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents, interprets and discusses the findings of the study. The study purpose was to establish the effect of information and communication technologies (ICTs) as innovation facilitators of Service Sector SMEs in Nairobi County. Collection of primary data was done using structured questionnaires, with data being collected from the owners and managers of the SMEs. Data analysis was centered on the objectives of the study and the findings are presented in this chapter.

4.2 Response Rate

In total, 100 questionnaires were distributed to the target population. Of the 100 distributed questionnaires, 93 questionnaires were duly completed and handed back which represented a rate of response of 93%. Therefore the instruments were regarded as responsive and formed the basis for data analysis. Mugenda (2008) states that a response rate suitable for analysis and reporting is 50%, and considers 60% to be generally good while a rate of 70% and above is excellent. This is further affirmed by Babbie (2010) who consider a response rate of above 70% as very good. The high response rate recorded can be accredited to the data collection procedures used. These involved the researcher pre-notifying the potential respondents of the intended survey, self-administering questionnaire (where respondents completed and these were picked shortly after), and making follow up calls to clarify queries as well as remind the respondents to fill the questionnaires.

4.3 Background Information

The aim of this section was to provide an understanding of the respondents, their businesses, and their personal capacity to give pertinent data sought for in this research.

4.3.1 Role of the Respondent

The study aimed to establish the role of the respondents in the business. The finding revealed that 79.57% of the respondents were the owners while 20.43% were the managers of the businesses. Owners and managers being the only respondents who were interviewed, enabled the researcher to achieve quality data because they had sufficient information about the business. Results are summarised in the table 4.1 below.

Table 4.1 Role of the Respondent

Role	Frequency	Percentage
Owner	74	79.57
Manager	19	20.43
Total	**93**	**100.00**

4.3.2 Gender of the Respondent

The study aimed to establish the gender groups of the respondents. This was done to ensure fair engagement of respondents in terms of their gender. Results are shown in table 4.2.

Table 4.2 Gender of the Respondent

Gender	Frequency	Percentage
Male	51	54.84
Female	42	45.16
Total	**93**	**100.00**

The results indicated that most (54.84%) SME owners and managers who were interviewed in Nairobi County were male while 45.16% were female. This shows that there was fair engagement of respondents in terms of their gender.

4.3.3 Age of the Respondent

Diverse age groups are found to hold varying opinions on different issues. In regard to this, the study required the respondents to indicate their age group. Results on age distribution are presented in table 4.3 below.

Table 4.3 Age of the Respondent

Age	Frequency	Percentage
20 years and below	3	3.23
21 – 30 years	17	18.28
31 – 40 years	31	33.33
41 – 50 years	27	29.03
Over 50 years	15	16.13
Total	**93**	**100.00**

Findings revealed that most (33.33%) of the SME owners and managers were aged between 31 to 40 years while only 3.23% of the SME owners and managers were below 20 years. From the finding respondents were fairly distributed in terms of their ages. The study also established that there were SME owners and managers aged

more than 50 years who were believed to have more management skills in their position comprising 16.13% of the sample.

4.3.4 Highest Level of Education

An individual's education level is highly associated with problem solving ability and approach to challenges. In this regard, the study required the respondents to indicate their highest level of education. Results are analyzed in table 4.4.

Table 4.4 Highest Level of Education

Level of Education	Frequency	Percentage
Primary Education	4	4.30
Secondary Education	13	13.98
Diploma	26	27.96
Bachelor's Degree	39	41.94
Post Graduate Degree	11	11.83
Total	**93**	**100.00**

Results in table 4.4 indicate that all the SME owners and managers interviewed had at least completed primary level education. This implied that most SME owners and managers held a good level of education. 41.94% of the SME owners and managers interviewed held a bachelor's degree education and only 4.3% of the respondents had primary education. Respondents' high level of education enabled the researcher to collect accurate and quality data.

4.3.5 Use of ICT Tools and Applications

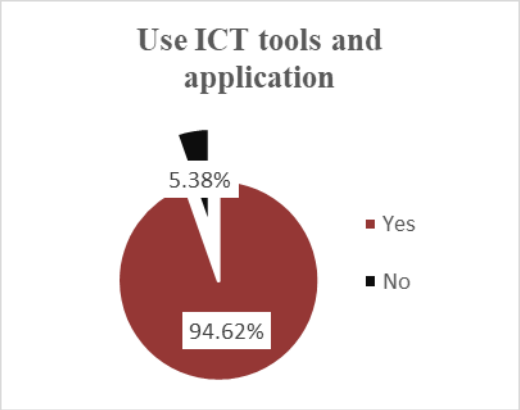

Figure 4. 1 Use of ICT Tools and Applications

The respondents were asked to indicate whether they used ICT tools and applications in their businesses. Results revealed that majority (94.62%) of the businesses were

using ICT tools and applications. Only 5.38% of the businesses had not adopted ICT tools and applications. Results are shown in figure 4.1.

4.3.6 Level of ICT Tools Adoption and Usage

Further the respondents were requested to rate the level of ICT adoption and usage by their businesses. Majority (37.63%) of the respondents stated that they moderately did so. 25.81% of the businesses had highly adopted and used ICTs while 17.20% had low adoption and usage of ICTs in their businesses. The results were analysed and are presented in the table 4.5.

Table 4.5 Level of ICT Tools Adoption and Usage

Level of Adoption & Usage	Frequency	Percentage
Negligible	5	5.38
Low	16	17.20
Moderate	35	37.63
High	24	25.81
Very High	13	13.98
Total	**93**	**100.00**

4.3.7 Business' Years of Existence

The research sought to establish the number of years the businesses were in operation. The results are summarized in table 4.6 below.

Table 4.6 Business' Years of Existence

Business Years' of Existence	Frequency	Percentage
Less than 5 years	7	7.53
6 to 10 years	19	20.43
11 to 20 years	40	43.01
20 years and above	27	29.03
Total	**93**	**100.00**

Most (43.01%) of the small and medium enterprises included in this study had existed for 11 to 20 years and only 7.53% had existed for less than five years. This implies that most of the business' involved in the study were well established and had existed for a long time, therefore in a position to provide quality data needed by the researcher.

4.3.8 Number of Employees

The number of employees determines the size of a business, therefore the respondents were requested to indicate the number of employees in their business. The results are shown in table 4.7.

Table 4.7 Number of Employees

Number of Employees	Frequency	Percentage
Less than 10 Employees	13	13.98
11 to 50 Employees	16	17.20
51 to 100 Employees	43	46.24
Above 100 Employees	21	22.58
Total	**93**	**100.00**

The results established that almost half (46.24%) of the enterprises included in this study had 51 to 100 employees, 22.58% had above 100 employees, while 13.98% had less than 10 employees. This shows that data was collected from a range of micro, small and medium enterprises.

4.4 Extent of ICT Adoption

The study revealed that most small and medium enterprises utilized the following ICT tools and facilities in their business; personal computers, email and internet. Other small and medium enterprises also use; websites, intranet, credit card facilities, business software, and data storage and security facilities. The respondents were further asked to rate the extent to which their businesses use ICT tools to carry out each of the outlined tasks, using a five-point scale where; 1 represented No Extent, 2 represented Little Extent, 3 represented Moderate Extent, 4 represented Large Extent and 5 represented Very Large Extent. The means and standard deviations have been calculated and summarized in table 4.8 below.

Table 4.8 Use of ICT tools

Use of ICT tools	Mean	Std. deviation
Internal and external communication with customers, suppliers and employees	4.387	0.746
Financial accounting	4.058	0.834
Transacting with customers and suppliers	3.750	0.882
Sharing files/information	4.230	0.396

Use of ICT tools	Mean	Std. deviation
Performing market and/or product research	3.863	0.290
Carrying out internet banking	4.050	0.808
Tracking orders, supplies and customer enquiries	4.222	0.775
Processing and storage of information (word processing)	3.962	0.135
Advertising and marketing the company's products/services	3.913	0.563
Searching for information	3.668	0.437

Based on the mean, the findings indicated that most Service Sector SMEs in Nairobi County use ICT tools majorly for internal and external communication with customers, suppliers and employees (4.387); sharing files/information (4.230); tracking orders, supplies and customer enquiries (4.222); financial accounting (4.058); and carrying out internet banking (4.050).

4.5 Effect of ICT Adoption on Innovation

Further, the study sought to establish the effect of ICT adoption on innovation. Using a five-point scale, the respondents were requested to rate the extent to which the aspects of ICT adoption influence innovative activities within their business. On the scale 1 represented Not at All, 2 represented Little Extent, 3 represented Moderately, 4 represented Greatly and 5 represented Very Greatly. Means and standard deviations have been calculated and are presented in table 4.9 below.

Table 4.9 Effect of ICT Adoption

Statements	Mean	Std. deviation
Availability of technology	3.679	0.104
The compatibility of the technology with the organisation's needs	3.883	0.664
The complexity of available technology	4.217	0.725
The size of the organisation	3.618	0.160
Management support	3.797	0.620
The scope of the organisation's operations	3.610	0.370
Financial resources	3.708	0.737
Competitive pressure	3.856	0.840
Government support	3.982	0.240
The industry in which the organisation operates	4.303	0.864

Based on mean, findings revealed that the industry in which the organisation operates (4.303) and the complexity of available technology (4.217) were the major influencers of innovative activities within Service Sector SMEs in Nairobi County. Other significant influencers are government support (3.982); compatibility of the technology with the organisation's needs (3.883); and competitive pressure (3.856).

4.6 Use of ICT to Support Activities

The SME owners and managers were requested to rate the extent to which their businesses used ICTs to support the stated activities. Rating was done using a five-point scale where; 1 represented Not at All, 2 represented Little Extent, 3 represented Moderately, 4 represented Greatly and 5 represented Very Greatly. Based on the means, majority of the respondents revealed that they used ICTs to support changes in the business model (4.239). Other significant uses of ICTs in innovative activities include to support: changes in the distribution strategy (3.975), changes in organisational processes (3.953), and changes in the service offering (3.810). Detailed findings are presented in table 4.10 below.

Table 4.10 Use of ICT to Support Activities

Factors	Mean	Std. deviation
Identifying and taking advantage of new opportunities	3.793	0.793
Changes in the service offering	3.810	0.403
Changes in business model	4.239	0.755
Changes in the distribution strategy	3.975	0.115
Changes in the promotion methods	3.757	0.391
Changes in the organizational structure	3.776	0.592
Changes in organizational processes	3.953	0.362

4.7 Regression Analysis

The study conducted regression analysis to examine whether there exists a relationship between ICT adoption and innovation in Service Sector SMEs in Nairobi County.

4.7.1 Model Summary

The model summary in the table 4.11 was used to test if significant variation exists between the independent variables and dependent variable. In addition, it was used in testing the proportion variation of independent variables on dependent variable.

Table 4.11 Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.821[a]	0.674	0.653	.001[a]

a. **Predictors:** Technological, Organizational and Environmental

b. **Dependent variable:** Innovation

R squared of 0.674 indicated that there existed a variation of 67.4% in the dependent variable as a result of changes in independent variables. This implied that there was proportion variation of 67.4% of Innovation in Service Sector SMEs attributed to Technological Context, Organizational Context and Environmental Context.

4.7.2 ANOVA

Table 4.12 ANOVA[a]

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	269.58	3	89.86	9.85	.001[a]
Residual	811.95	89	9.123		
Total	1081.53	92			

a. **Predictors:** Technological, Organizational and Environmental

b. **Dependent variable:** Innovation

The ANOVA results in table 4.12 show F-value of 9.85, which is significant at 0.001<0.05. This signifies a model fit and implies a match between the regression model and the data which means that the use of regression analysis in this study was justified.

4.7.3 Coefficient Analysis

From the results on table 4.13, β_0= 2.138 represented the constant which predicted the value of innovation of Service Sector SMEs while Technological Context, Organizational Context and Environmental Context factors were held constant at zero (0).

Table 4.13 Regression Coefficients

Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	2.138	0.262		8.160	.001
Technological Context	0.212	0.021	0.201	10.09	.000
Organizational Context	0.185	0.028	0.164	6.607	.005
Environmental Context	0.107	0.021	0.094	5.095	.001

a. **Predictors:** Technological, Organizational and Environmental

b. **Dependent variable:** Innovation

The optimal regression model is therefore:

$Y = 2.138 + 0.212X_1 + 0.185X_2 + 0.107X_3 + \varepsilon$

Regression results revealed that technological context has a significant and positive influence on innovation of Service Sector SMEs in Nairobi County as shown by β_1=0.212, p=0.000. This means that increase in the level of, among others, the availability, complexity, and compatibility of technology would lead to an increase in innovation of SMEs by β_1= 0.212. Regression results also revealed that organizational context in Service Sector SMEs in Nairobi County has a significance influence on their innovation as indicated by β_2=0.185, p=0.005. This implies that increase in an organisation's size, scope, financial resources and management support for innovative activity leads to an increase in the innovation by β_2=0.185. Further, the study found a significant positive relationship between environmental context and innovation of Service Sector SMEs in Nairobi County as indicated by β_3=0.107, p=0.001. The effect is that a favourable industry, competitive, and government support environment would lead to an increase in innovation by β_3=0.107. This finding concurs with that of Barba et al. (2007) as they revealed that today's business environment makes the adoption of ICT an essential element for the survival of SMEs.

4.8 Discussion of the Findings

From the regression model, the study found that technological context, organizational context and environmental context had a great influence on innovation. The study found that the intercept was 2.138 for all variables. The three independent variables explained a substantial 67.4% of innovation in Service Sector SMEs in Nairobi County as represented by R squared (0.674). This therefore implies that the three independent variables contribute 67.4% of the SMEs' innovation in while other factors and random variations not studied in this research contributes the remaining 32.6% of innovation. Further regression analysis established that technological context has a significant and positive effect on innovation of Service Sector SMEs in Nairobi County. This means that the level of availability, complexity and compatibility of technology adopted by a business would lead to an increase in innovation. Regression results also revealed that organizational context in Service Sector SMEs in Nairobi County has a significant influence on innovation. This implies that an increase in the organisation's size, scope, financial resources, and management support for innovative activity leads to an increase in the innovation. The results showed that there was a significant positive relationship between environmental context and innovation of Service Sector SMEs in Nairobi County. The implication is that a favourable industry, competitive and government support environment would lead to an increase in innovations. These findings are in line with the study carried out by Oliveira & Martins (2010) on the Technology-Organisation-Environment (TOE) Framework. According to the study, an organization is positively influenced by three aspects when adopting and implementing technology; the technology context, organization context, and environment context.

The study further revealed that small and medium enterprises utilize personal computers, email and internet in their businesses. Other small and medium enterprises also use; websites, intranet, credit card facilities, business software, and data storage and security facilities. The study also revealed that most of the respondent businesses use ICT tools to a great extent for internal and external communication with customers, suppliers and employees; sharing files/information; tracking orders, supplies and customer enquiries; financial accounting; and carrying out internet banking. These findings concur to those of Kiveu and Ofafa (2013) who found that ICTs around the world are mainly used in the areas of production, business methods,

advertising, trade, communication, and consumer patterns. The findings are also support the study conducted by Barba et al. (2007) who concluded that ICT adoption offers benefits such as: improved management of information and knowledge, reduced costs of transacting, increase in the rate and dependability of transactions, improvement in communication, improved quality of services for customers, enhanced productivity, embracing of new organizational and managerial models, gaining access to new markets and new business models, and improved efficiency of the human resources.

Koellinger (2005) found that ICT enables innovation by opening up new markets and new ways of doing business thereby reducing geographical barriers; Zhu et al. (2006) in their research of European enterprises concluded that compatibility is a major influencing factor when it comes to the adoption of digital transformation technology; Sin Tan et al. (2009) concluded that observability, relative advantage, complexity, and compatibility were main influencers of ICT adoption by SMEs in Malaysia; Premkumar and Roberts (1999) found that competitive pressure was a key determinant of technology adoption in small businesses; Li (2008) found that competitive pressures and government support significantly influenced the adoption of e-procurement by firms in the manufacturing sector; and Teo et al. (2009) concluded that industry significantly affects e-procurement adoption. This study similarly established that the industry in which the organisation operates and the complexity of available technology were the major influencers of innovative activities within Service Sector SMEs in Nairobi County. Other significant influencers are government support; compatibility of the technology with the organisation's needs; and competitive pressure.

Finally, majority of the SME owners and managers revealed that their businesses use ICTs to support changes in the business model. Other significant uses of ICTs in innovative activities include to support: changes in the distribution strategy, changes in organisational processes, and changes in the service offering. These findings are in line with those of Barba et al. (2007) as they concluded in their study that ICT adoption supports management of information and knowledge, cost reduction, the dependability of transactions, communication, quality of services provided to customers, productivity, new organizational and managerial models, access to new markets and new business models, and efficiency of the human resources.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter gives a summary of key study findings, conclusions drawn and recommendations proposed. The conclusions and recommendations are based on the main objective of the study.

5.2 Summary of Findings

Key findings are presented in this section under each study objective.

Objective 1: To establish the extent of ICT adoption in Service Sector SMEs in Nairobi County.

The study established that small and medium enterprises utilize personal computers, email, internet, websites, intranet, credit card facilities, business software, and data storage and security facilities in their day-to-day businesses activities. Most businesses use ICT tools to a great extent for internal and external communication with customers, suppliers and employees; sharing files/information; tracking orders, supplies and customer enquiries; financial accounting; and carrying out internet banking. Further, the study revealed that the industry in which the organisation operates and the complexity of available technology were the major influencers of innovative activities within Service Sector SMEs in Nairobi County. Other significant influencers are government support; compatibility of the technology with the organisation's needs; and competitive pressure.

Objective 2: To determine the effect of ICT adoption on innovation by Service Sector SMEs in Nairobi County.

Regression analysis established that technological context has a significant and positive influence on innovation of SMEs. This means that technology availability, complexity and compatibility of technology would lead to an increase in innovation by Service Sector SMEs in Nairobi County. Regression results also revealed that organizational context in Service Sector SMEs in Nairobi County has a significant influence on innovation. This implies that an increase in an organization's size, scope, financial resources, and management support for innovative activity would lead to an increase in innovation. Finally the results showed that there was a significant positive relationship between environmental context and innovation of Service Sector SMEs in

Nairobi County. The implication is that a favourable industry, competitive and government support environment would lead to an increase in innovations. Most SME owners and managers revealed that their businesses use ICT to support changes in the business model. Other significant uses of ICTs in innovative activities include to support: changes in the distribution strategy, changes in organisational processes, and changes in the service offering.

5.3 Conclusion

This study has presented a comprehensive review of the effect of information and communication technologies (ICTs) as innovation facilitators of Service Sector SMEs in Nairobi County. Based on the study findings, it can be concluded that Technological Context, Organizational Context and Environmental Context have a positive influence on innovation of Service Sector SMEs in Nairobi County. Technology availability, complexity and compatibility have an effect on innovation by Service Sector SMEs in Nairobi County. Further, the firm's size, scope, financial resources and management support for innovative activity affect the innovation levels of Service Sector SMEs in Nairobi County. The study also concluded that a significant positive relationship between the environmental context and innovation of Service Sector SMEs in Nairobi County. This implies that the industry in which an organization operates, the competitive environment and government support for innovative activity all have an effect on innovations by Service Sector SMEs in Nairobi County.

The study also concludes that most small and medium enterprises utilize the following ICT tools and applications during their operations; personal computers, email, internet websites, intranet, credit card facilities, business software, and data storage and security facilities. Most SMEs use ICT tools to a great extent for internal and external communication with customers, suppliers and employees; sharing files/information; tracking orders, supplies and customer enquiries; financial accounting; and carrying out internet banking.

The industry in which the organisation operates and the complexity of available technology were the major influencers of innovative activities within Service Sector SMEs in Nairobi County. Other significant influencers are government support; compatibility of the technology with the organisation's needs; and competitive pressure.

Finally the study concludes that most Service Sector SMEs use ICT to support changes in the business model. Other significant uses of ICTs in innovative activities include to support: changes in the distribution strategy, changes in organisational processes, and changes in the service offering.

5.4 Recommendations

Based on the findings of this research it is recommendable for Service Sector SMEs to adopt ICT tools in their businesses. This recommendation is informed by the observed positive relationship between innovation in Service Sector SMEs and ICT adoption and utilization, their frequency of use and level of support accorded to SME activities. However, in adopting ICTs a cost-benefit analysis needs to be carried out to ensure that the SMEs' primary objective of making profit is not overshadowed. This is because adopting and using ICT tools encompasses some inherent costs that the SMEs need to be aware of. Furthermore, in order to realize a significant positive change in the innovation factors for the SMEs, it is recommended that the SMEs should provide sufficient necessary support facilities for the services. In addition, they should train their staff and customers effectively and promote the use of the ICT tools to enhance effective adoption by customers.

Owners of SMEs should be encouraged to start investing in basic ICT tools to help improve their business management practices thus making them competitive in the dynamic business environment. The owners and management of SMEs should be active in research organizational activities in order to find the latest ICT tools and equipment that could be useful in promoting service delivery efficiency that suits the organisation's needs. SMEs should also assess and consider opportunities to adopt a variety of ICT tools so as to be able to better utilize available communication options.

The Government of Kenya should consider having policies and programs that mobilize resources for the purpose of creating awareness on and encouraging maximum use of available information and communication technologies available to SMEs.

5.5 Recommendations for Further Research

This study looked at Service Sector SMEs in Nairobi County. Further comparative studies should be carried out focusing on areas not covered in this study. More interesting is a study that would cover general ICT adoption by all type of businesses. This is likely to give stakeholders like the government a good feel of the situation nationally.

This research was a descriptive survey and was also limited by the use of questionnaires as the only research instrument, a case study is therefore recommended for a more extensive study of the research variables in the area, possibly on the subject of ICT utilization using additional research instruments like interviews and focus group discussions.

A survey should be done to determine the existence and influence of business support services in the area and their effectiveness in promoting the use of ICT tools among the SMES.

REFERENCES

Agboh, D. (2015). Drivers and challenges of ICT adoption by SMEs in Accra metropolis, Ghana. *Journal of Technology Research, 6*, 1.

Alam, S. & Noor, M. (2009). ICT adoption in small and medium enterprises: An empirical evidence of service sectors in Malaysia. *International Journal of Business and management, 4*(2), 112.

Alshamaila, Y., Papagiannidis, S., & Li, F. (2013). Cloud computing adoption by SMEs in the north east of England: A multi-perspective framework. *Journal of Enterprise Information Management, 26*(3), 250-275.

Angeles, R. (2013). Using the Technology-Organization-Environment framework and Zuboff's concepts for understanding environmental sustainability and RFID: Two case studies. *International Journal of Social, Education, Economics and Management Engineering, 7*(11), 1599-1608.

Apulu, I., & Ige, E. (2011). Are Nigeria SMEs Effectively Utilizing ICT? *International Journal of Business and Management, 6*(6), 207.

Apulu, I., & Latham, A. (2010). Benefits of information and communication technology in small and medium sized enterprises: A case study of a Nigerian SME. In *Proceedings of the 15th Annual Conference on UK Academy for Information Systems,* (pp. 23-24).

Ashrafi, R., & Murtaza, M. (2008). Use and impact of ICT on SMEs in Oman. *Electronic Journal Information Systems Evaluation, 11*(3), 125-138.

Babbie, E. (2010). Research design. *The practice of social research,* 85-88.

Baker, J. (2012). The technology–organization–environment framework. In *Information systems theory* (pp. 231-245). New York: Springer.

Bakos, Y. (1998). The emerging role of electronic marketplaces on the Internet. *Communications of the ACM, 41*(8), 35-42.

Barba-Sánchez, V., del Pilar Martínez-Ruiz, M., & Jiménez-Zarco, A. (2007). Drivers, benefits and challenges of ICT adoption by small and medium sized enterprises (SMEs): a literature review. *Problems and Perspectives in Management, 5*(1), 103-114.

Beck, T., Demirguc-Kunt, A., & Levine, R. (2005). SMEs, growth, and poverty: cross-country evidence. *Journal of economic growth, 10*(3), 199-229.

Berisha-Namani, M. (2009). The role of information technology in small and medium sized enterprises in Kosova. In *Fulbright Academy Conference* (pp. 1-8).

Boohene, R., Ofori, D., Boateng, B., & Boohene, K. (2015). Information and communication technology usage and small and medium sized enterprises growth in the Accra metropolis. *Journal of Business and Enterprise Development, 5*, 52-74.

Bowen, M., Morara, M., & Mureithi, S. (2009). Management of business challenges among small and micro enterprises in Nairobi-Kenya. *KCA Journal of Business Management, 2*(1), 16-31.

Brethenoux, J., & Mulder, M. (2015). Unleashing the full potential of the Kenyan SME sector. *An update study on the key challenges faced by the missing middle in Kenya.*

Brynjolfsson, E., & Hitt, L. (2000). Beyond computation: Information technology, organizational transformation and business performance. *Journal of Economic perspectives, 14*(4), 23-48.

Carpenter, M., Geletkanycz, M., & Sanders, W. (2004). Upper echelons research revisited: Antecedents, elements, and consequences of top management team composition. *Journal of management, 30*(6), 749-778.

Chopra, S., & Meindl, P. (2001). E-business and the supply chain. *Supply Chain Management.*

Cohen, L., Manion, L., & Morrison, K. (2004). *Research methods in education.* New York: Routledge.

Cooper, R., & Zmud, R. (1990). Information technology implementation research: a technological diffusion approach. *Management science, 36*(2), 123-139.

Damanpour, F. (1991). Organizational innovation: A meta-analysis of effects of determinants and moderators. *Academy of management journal, 34*(3), 555-590.

Drucker, P. (1985). *Innovation and entrepreneurship practices and principles.* AMACON.

Emma, A., & Georgia, A. (2009). *E-Business Adoption in the Banking Industry in Ghana* (Doctoral dissertation, Doctoral thesis), Department of Business Administration and Social Science, Division of Industrial marketing and e commerce, Lulea University of Technology, Lulea, 39p).

Ewing, J., Okolloh, O., & Rawlings, L. (2011). Transforming East African ICT Sector by Creating a Business Engine for SMEs: SMEs and the East Africa ICT Sector.

Fabritz, N. (2015). ICT as an Enabler of Innovation. *Evidence from German Microdata* (No. 195). Ifo Working Paper.

Fu, X., & Hou, J. (2015). The innovation effects of ICT adoption in Ghana. *TMCD Working Paper: TMD-WP-71,* ISSN 2045-5119.

Ghobakhloo, M., Hong, T., Sabouri, M., & Zulkifli, N. (2012). Strategies for successful information technology adoption in small and medium-sized enterprises. *Information, 3*(1), 36-67.

Hempell, T., Van Leeuwen, G., & Van der Wiel, H. (2004). ICT, innovation and business performance in services: evidence for Germany and The Netherlands. *The economic impact of ICT,* 131.

Henderson, R., & Clark, K. (1990). Architectural innovation: The reconfiguration of existing product technologies and the failure of established firms. *Administrative science quarterly,* 9-30.

Huarng, K., & Hui-Kuang Yu, T. (2011). Entrepreneurship, process innovation and value creation by a non-profit SME. *Management Decision, 49*(2), 284-296.

Ion, P., & Andreea, Z. (2008). Use of ICT in SMEs management within the sector of services. *The Journal of the Faculty of Economics-Economic, University of Oradea, Faculty of Economics, 4*(1), 481-487.

Irungu, A., & Arasa, R. (2017). Factors influencing competitiveness of SMEs in Nairobi County, Kenya. *International Journal of Entrepreneurship and Project Management, 2*(1), 22-46.

Ismail, R., Jeffery, R., & Van Belle, J. (2011). Using ICT as a value adding tool in South African SMEs. *Journal of African Research in Business & Technology,* 1-11.

Israel, G. (1992). Determining sample size.

Jeyaraj, A., Rottman, J., & Lacity, M. (2006). A review of the predictors, linkages, and biases in IT innovation adoption research. *Journal of information technology, 21*(1), 1-23.

Jin, Z., Hewitt-Dundas, N., & Thompson, N. (2004). Innovativeness and performance: evidence from manufacturing sectors. *Journal of Strategic Marketing, 12*(4), 255-266.

Katua, N. (2014). The role of SMEs in employment creation and economic growth in selected countries. *International Journal of Education and Research, 2*(12), 461-472.

Kenya National Bureau of Statistics (2016). *Economic survey 2016.* Nairobi: KNBS

Kenya National Bureau of Statistics (2016). *Micro, small and medium establishment (MSME) survey 2016.* Nairobi: KNBS

Kiprotich, E. (2014). The influence of social capital on the growth of SMEs in Nairobi County, Kenya.

Kiveu, M., & Ofafa, G. (2013). Enhancing market access in Kenyan SMEs using ICT. *Global Business and Economics Research Journal, 2*(9), 29-46.

Koellinger, P. (2005). Why IT matters: *An empirical study of e-business usage, innovation, and firm performance* (No. 495). DIW Discussion Papers.

Kutlu, B., & Özturan, M. (2008). The usage and adoption of IT among SMEs in Turkey: An exploratory and longitudinal study. *Journal of Information Technology Management, 19*(1), 12-24.

Leung, D., Lo, A., Fong, L., & Law, R. (2015). Applying the Technology Organization-Environment framework to explore ICT initial and continued adoption: An exploratory study of an independent hotel in Hong Kong. *Tourism recreation research, 40*(3), 391-406.

Li, Y. (2008). An empirical investigation on the determinants of e-procurement adoption in Chinese manufacturing enterprises. *In Management Science and Engineering, 2008. ICMSE 2008. 15th Annual Conference Proceedings., International Conference on* (pp. 32-37). IEEE.

Lin, H. (2014). Understanding the determinants of electronic supply chain management system adoption: Using the technology–organization environment framework. *Technological Forecasting and Social Change, 86*, 80-92.

Lippert, S., & Govindarajulu, C. (2006). Technological, organizational, and environmental antecedents to web services adoption. *Communications of the IIMA, 6*(1), 14.

Low, C., Chen, Y., & Wu, M. (2011). Understanding the determinants of cloud computing adoption. *Industrial management & data systems, 111*(7), 1006-1023.

Matambalya, F. & Wolf, S. (2001). The role of ICT for the performance of SMEs in East Africa: Empirical evidence from Kenya and Tanzania. *ZEF Discussion Papers on Development Policy*, *42*, 30.

Matthews, P. (2007). ICT assimilation and SME expansion. *Journal of International Development, 19*(6), 817-827.

Maxwell, J. (2008). Designing a qualitative study. *The SAGE Handbook of Applied Social Research Methods, 2*, 214-253.

McGrath, H., & O'Toole, T. (2012). Critical issues in research design in action research in an SME development context. *European Journal of Training and Development, 36*(5), 508-526.

Ministry of Industrialization and Enterprise Development (2015). *Kenya's industrial transformation programme.* Nairobi: MIED.

Miles, M., & Huberman, A. (1984). *Qualitative data analysis: A sourcebook of new methods.*

Mugenda, A. G. (2008). Social science research: Conception, methodology and analysis. *Nairobi: Kenya Applied Research and Training Services.*

Mutua, J. & Wasike, W. (2009). ICT adoption and performance of small and medium sized enterprise in Kenya. *Special Research Project on ICT and Economic Development in Africa.*

Mwai, E. (2016). Factors Influencing Adoption of ICT by Small and Medium Enterprises in the Hospitality Industry in Kenya. *IOSR Journal of Mobile Computing & Application, 3*(2), 12-19.

Nabintu, N. (2013). *Factors affecting the performance of small and micro enterprises (SMEs) traders at city park hawkers market in Nairobi County, Kenya* (Doctoral dissertation).

Naudé, W., Szirmai, A., & Goedhuys, M. (2011). *Innovation and entrepreneurship in developing countries:* UNU.

Nduati, N., Ombui, K, & Kagiri, A. (2015). Factors Affecting ICT Adoption in Small and Medium Enterprises in Thika Town, Kenya. *European Journal of Business Management, 2* (3), 395-414.

Njenga, A. (2015). *Innovation and operational performance of small and medium enterprises in Nairobi City County* (Doctoral dissertation).

Okadapau, M., Omwenga, E., & Oboko, R. (2016). State and Extent of Electronic Commerce Adoption among SMEs in Kenya. *Journal of Emerging Trends in Computing and Information Sciences, 7*(5).

Olise, M., Anigbogu, T., Edoko, T., & Okoli, M. (2014). Determinants of ICT adoption for improved SME's performance in Anambra state, Nigeria. *American International Journal of Contemporary Research, 4*(7), 163-176.

Oliveira, T., & Martins, M. (2010). Information technology adoption models at firm level: review of literature. In *European Conference on Information Management and Evaluation* (p. 312). Academic Conferences International Limited.

Ong'olo, D., & Awino, S. (2013). Small and medium enterprises and devolved government system: An assessment of the regulatory and institutional challenges affecting the SMEs development in Kenya. *ICBE-RF Research Report N*.

Ongori, H. (2009) Role of information communication technologies adoption in SMES: evidence from Botswana. *Research Journal of information technology, 1*(2), 79-85.

Organisation for Economic Co-operation and Development (2005). *Guidelines for collecting and interpreting innovation data. Oslo Manual, 3rd edition.*

Organisation for Economic Co-operation and Development (2000). *Local access pricing and e-commerce: An update on the statistics.*

Popa, I., Preda, G., & Boldea, M. (2010). A theoretical approach of the concept of innovation. *Managerial Challenges of the Contemporary Society. Proceedings*, 151.

Premkumar, G. (2003). A meta-analysis of research on information technology implementation in small business. *Journal of organizational computing and electronic commerce, 13*(2), 91-121.

Premkumar, G., & Roberts, M. (1999). Adoption of new information technologies in rural small businesses. *Omega, 27*(4), 467-484.

Pullen, A., Weerd- Nederhof, D., Groen, A., Song, M., & Fisscher, O. (2009). Successful patterns of internal SME characteristics leading to high overall innovation performance. *Creativity and Innovation Management, 18*(3), 209-223.

Republic of Kenya (2012). *The Micro and Small Enterprises Act No. 55 of 2012.* Nairobi: Government Printer

Ritchie, B., & Brindley, C. (2005). ICT adoption by SMEs: Implications for relationships and management. *New Technology, Work and Employment, 20*(3), 205-217.

Rogers E. (1995). *Diffusion of Innovations.* New York.

Rogers, M. (1998). The definition and measurement of innovation. *Melbourne Institute of Applied Economic and Social Research*, 1-27.

Sahlfeld, M. (2007). How does ICT work for development? A review of the challenges and opportunities. *ATDF Journal, 4*(1), 22-36.

Scupola, A. (2009). SMEs'e-commerce adoption: perspectives from Denmark and Australia. *Journal of Enterprise Information Management, 22*(1/2), 152-166.

Shiu, E., & Walker, D. (2007). New product market visioning in small enterprises: A preliminary empirical study within the central technology belt in England. *Journal of Small Business and Enterprise Development, 14*(1), 81-92.

Sin Tan, K., Choy Chong, S., Lin, B., & Cyril Eze, U. (2009). Internet-based ICT adoption: evidence from Malaysian SMEs. *Industrial Management & Data Systems, 109*(2), 224-244.

Stockdale, R., & Standing, C. (2006). A classification model to support SME e commerce adoption initiatives. *Journal of small business and enterprise development, 13*(3), 381-394.

Swift, M. (2009). ICTs for SMEs—How ICT Can Be a Force of Viability. In *ICT for SMEs Seminar, The Cascadia Hotel & Conference Centre Port of Spain, Trinidad & Tobago Wednesday, 25th March.*

Szirmai, A., Naudé, W., & Goedhuys, M. (2011). *Entrepreneurship, innovation, and economic development.* Oxford University Press.

Teo, T., Chan, C., & Parker, C. (2004). Factors affecting e-commerce adoption by SMEs: A meta-analysis. *ACIS 2004 Proceedings*, 54.

Teo, T., Lin, S., & Lai, K. (2009). Adopters and non-adopters of e-procurement in Singapore: *An empirical study. Omega, 37*(5), 972-987.

Thomas, T., Singh, L., & Gaffar, K. (2013). The utility of the UTAUT model in explaining mobile learning adoption in higher education in Guyana. *International Journal of Education and Development using Information and Communication Technology, 9*(3), 71.

Tornatzky, L., Fleischer, M., & Chakrabarti, A. (1990). *Processes of technological innovation.* Lexington Books.

Van der Sijde, P., de Boer, S., McGowan, P., & Korteweg, B. (2012). Exploring RFID adoption in South African industries. *International Journal of Innovation and Regional Development, 4*(6), 488-508.

Venkatesh, V., Morris, M., Davis, G., & Davis, F. (2003). User acceptance of information technology: *toward a unified view. MIS quarterly*, 425-478.

Zhu, K., Dong, S., Xu, S., & Kraemer, K. (2006). Innovation diffusion in global contexts: determinants of post-adoption digital transformation of European companies. *European journal of information systems, 15*(6), 601-616.

Zhu, K., Kraemer, K., & Xu, S. (2003). Electronic business adoption by European firms: a cross-country assessment of the facilitators and inhibitors. *European Journal of Information Systems, 12*(4), 251-268.

APPENDICES

Appendix 1: Questionnaire

EFFECT OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTs) AS INNOVATION FACILITATORS OF SERVICE SECTOR SMEs IN NAIROBI COUNTY

AIM

This survey aims to study the Effect of Information and Communication Technologies (ICTs) as Innovation Facilitators of Service Sector SMEs in Nairobi County. The objectives are to establish the extent of ICT adoption in service provision SMEs in Nairobi County and to determine the effect of ICT adoption on innovation by service provision SMEs in Nairobi County.

INSTRUCTIONS

Please provide information in the spaces provided by checking (ticking) the spaces most applicable to you or filling in the blanks.

All the information received will be treated confidentially and will be used for academic purposes only.

SECTION A: GENERAL INFORMATION

1. **Name of the Business:**

   ……

2. **Location of the business (Constituency)**

   ……

3. **Type of service offered by the business:**

   ……

4. **How many full time employees does the company have?**
5. **How long has the company been in existence? (in years):**

   ……

6. **Please indicate your role in the business**

Owner [ ]

Manager [ ]

7. **Gender**

Female [ ]

Male [ ]

8. Age Bracket

20 years and below [ ]

21 – 30 years [ ]

31 – 40 years [ ]

41 – 50 years [ ]

Over 50 years [ ]

9. Please indicate your highest level of education

Primary Education [ ]

Secondary Education [ ]

Diploma [ ]

Bachelors Degree [ ]

Post Graduate Degree [ ]

10. Do you use ICT tools and applications in your Business?

Yes [ ]

No [ ]

11. How would you rate the level of ICT adoption and usage by your business?

Negligible [ ]

Low [ ]

Moderate [ ]

High [ ]

Very High [ ]

SECTION B: EXTENT OF ICT ADOPTION

12. Which of the following ICT tools and facilities are utilized by your business? (tick as many as applicable)

ICT tools and facilities	
Personal computers/laptops	
Email	
Internet	
Company website	
Intranet and/or extranet	
Credit card facilities	
Business software	
Data storage and security	

ICT tools and facilities	
Any other? (please specify) …… ……	

13. To what extent does your business use ICT tools to carry out each of the following tasks?

	No extent	***Little extent***	***Moderate extent***	***Large extent***	***Very large extent***
Internal and external communication with customers, suppliers and employees					
Financial accounting					
Transacting with customers and suppliers					
Sharing files/information					
Performing market and/or product research					
Carrying out internet banking					
Tracking orders, supplies and customer enquiries					
Processing and storage of information (word processing)					
Advertising and marketing the company's products/services					
Searching for information					
Any other? (please specify) …… ……					

SECTION C: THE EFFECT OF ICT ADOPTION ON INNOVATION

14. To what extent does each of the following aspects of ICT adoption influence innovative activities within your business?

	Not at all	***Little extent***	***Moderately***	***Greatly***	***Very greatly***
Technological Context:					
Availability of technology					
The compatibility of the technology with the organisation's needs					
The complexity of available technology					
Organizational Context:					
The size of the organisation					
Management support					
The scope of the organisation's operations					
Financial resources					
Environmental Context:					
Competitive pressure					
Government support					
The industry in which the organisation operates					

15. In your view, what should be done to further encourage innovative activities by SMEs in service provision?

……

……

……

16. Extent does your business use ICT to support the following activities?

	Not at all	***Little extent***	***Moderately***	***Greatly***	***Very greatly***
Identifying and taking advantage of new opportunities					
Changes in the service offering					
Changes in business model					
Changes in the distribution strategy					
Changes in the promotion methods					
Changes in the organizational structure					
Changes on organizational processes					

17. Please indicate the nature of any other new ICT enabled opportunities that your business has undertaken over the past three (3) years.

……

……

THANK YOU FOR YOUR COOPERATION