

**TECHNOLOGICAL INNOVATIONS AND PERFORMANCE OF
MICRO AND SMALL ENTERPRISES IN NAIROBI COUNTY,
KENYA**

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DECLARATION

I, the undersigned, declare that this is my original work and has not been presented to any institution or university other than the University of Nairobi for examination.

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

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DEDICATION

This project paper is dedicated to my family, who have always encouraged and supported me throughout my life. They have been, and still are, the pillar of strength in my life. I thank you.

To my friends, finishing this project would have been impossible if it were not for your constant impetus in concluding this project. Also for your wonderful support and great input, you are much appreciated.

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To God, who made all this possible. All glory unto him.

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ABSTRACT

The general objective of the study was to examine technological innovations and performance of micro and small enterprises in Nairobi County, Kenya. This study's theoretical foundation was built on the resource based view theory of the firm, technology acceptance model and the diffusion of innovation theory. A descriptive cross-sectional survey design was used for the study. The study targeted MSEs that have been in operation for more than five years at the time of the study. The target population consisted of MSEs from different sectors including general trade, transport and communication, agriculture, hospitality, professional and technical, education and entertainment and manufacturing. The study used stratified sampling technique where the population was divided into seven strata depending on the sector the firm is operating in. Simple random sampling methodology was then applied within each stratum to select a sample from the population. The study took 10% of the target population of 1539 hence obtaining a sample of 155 MSEs as respondents. Primary data was used in the study. The primary data was collected by use of structured questionnaires using the Likert Scale. The targeted respondents in this study were owners and representatives of the MSEs. Data was analyzed using descriptive and inferential statistics. Descriptive analysis involved computation of mean, frequency and percentages. Inferential statistics involved correlations and regression analysis were calculated to draw inferences to the entire population. The study concluded that MSEs had adopted technological innovation. Technological innovation encompassed product innovation, process innovation, market innovation and information technology innovation. The adoption of this technological innovation gave the MSEs a competitive edge which boosted their performance. The study also concluded that the effect of technological innovation on the performance of MSEs was positive. This was realized after establishing that product innovation, process innovation, market innovation and information technology innovation had a positive and significant relationship with the performance of MSEs. This meant that adoption of technological innovation resulted to better firm performance. The study recommended that MSEs should make adoption of technological innovation a priority as it enhances firm performance. The study also recommends that, on identification of the type of technological investment that is suitable for their type of business, they should be keen to identify the specific aspects so as to boost their performance.

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ABBREVIATIONS AND ACRONYMS

EDI	Electronic Data Interchange
GDP	Gross Domestic Product
GHRIS	Government Human Resource Information System
GPS	Global Positioning Systems
IBM	International Business Machines
ICT	Information, Communication and Technology
IFMIS	Integrated Financial Management Information Systems
IT	Information Technology
POS	Point Of Sales
R&D	Research and Development
RBV	Resource Based View
TAM	Technology Acceptance Model

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

In the dynamic and globally competitive environment, the inability of established firms to come up with breakthrough technological innovation that will help them operate effectively is a truism today (Davila, 2014). Technological innovation is part of strategy implementation that enhances enterprise performance through esteem expansion and hazard decrease (Drucker, 2001). Advancement techniques are key in enhanced execution among numerous Enterprises and are reflected by expanded productivity and overall industry development (Palmer & Kaplan, 2007). Yilmaz, Alpkın and Ergun (2005) also recognize technological innovation as critical enablers for enterprise's performance by creating value in the undeniably unpredictable and quickly evolving environment.

This study's theoretical foundation was built on RBV theory of the firm, technology acceptance model and the diffusion of innovation theory. According to RBV theory of the firm, performance is centered on how the resources and capabilities controlled by a firm enable it to acquire competitive advantage edge. The resources that are held by a Micro and Small Enterprise (MSE) together with the technological innovation will have an extensive impact in the generation of improved performance. Technology Acceptance Model (TAM) clarifies the way clients embrace and make use of an innovative idea. TAM will be applied in this study to establish how technology acceptance influences technological innovation among MSEs. Diffusion of Innovation refers to the communication of an idea which is considered to be novel to the members of a social system through certain preferred channels. Innovation have to gain acceptability in a

wide area in order to be sustainable. This theory has guided the study of the adoption of various technological innovation in businesses.

The micro and small businesses in Kenya tend to create employment opportunities, serve as sources of livelihood to the poor, income generation and accelerate economic growth. SMEs have been classified as the main drivers of rapid industrialization and sustainable economic growth (Koech, 2011). Studies by Maalu, et al., (1999) looked into the function of Medium and Small Enterprises in Kenya's economy and the findings reported an important role played by SMEs through income generation and employment creation, the SMEs were also useful to the economy in facilitating development of skills and production of goods and services. The motivation of the current study is to determine the influence of the different types of innovations (Product, service, process, marketing and IT) on performance of MSEs in Nairobi County.

1.1.1 Types of Innovations

Innovation is the process by which an idea is turned into a service or good which creates value (Kantor, 2001). With regard to this study, the term innovation only implies to technological innovation and not any other innovation type. From the many definitions, technological innovation refers to the scientific and system based process. The process has several influencing factors that affect or are influenced by the internal strengths of the firm which are its technological learning ability and networking capabilities within the external environment. It would harness the existing resources and expand the firm's innovation prospects with the result being the production of new or improved products and/or production process (Goh, 2002).

Gamal et al., (2011) defines innovation as the introduction of a new process, product or service through specific business models into the marketplace, either through commercialization or utilization. From this definition, innovation encompasses: service, product, business model and process innovation and all leading to strengthening the company's competitive advantage. This definition highlights the fact that innovation is a multidimensional and complex activity that is necessary for firms to compete favorably in the market (Gamal et al., 2011).

Technological innovation entails creating a more effective and efficient Enterprise and increased alignment between technological advancements and business goals through application of computers, networks, technologies and systems. Nadler and Tushman (2006) noted that, technological innovation is considered to be an imaginative and novel process which enables the creation of new methods, goods and services in an Enterprise. Swanson (1994) further notes that technological innovation integrates digital components in its applications.

The OECD Oslo manual (2005) identifies and describes four types of innovation, namely: process, product, organizational and marketing innovation. Under this typology, product innovation encompasses both product (physical good) and service innovation while organizational innovation encompasses both structural organizational innovation and procedural organizational innovation. However, in subsequent chapters the researcher studied product innovation and service innovation as separate variables as well as structural organizational innovation and procedural organizational innovation. The researcher also included market innovation to this typology for the purpose of the study.

1.1.2 Enterprise Performance

Richard, Yip, Johnson and Devinney (2009) defined enterprise performance as fulfillment of the intended mission of enterprises which is obtained through good management, persistent efforts and superior governance in order to achieve goals. The multiple performance criteria for nonprofit enterprises include responsiveness, flexibility, cost, productivity, asset efficiency utilization and reliability (Chang, Tsui, & Hsu, 2013). An Enterprise's performance is centered on the kind of activities that it carries out in fulfillment of its mission. End results are the observable aspects that determine an Enterprise's performance (Valmohammadi & Servati, 2011).

Some other frequent performance measures include productivity, market share, profitability, growth, competitive position and stakeholder satisfaction (Kantor, 2001). (Chesbrough, 2010); business performance is split into four dimensions, rational goals, internal processes, human relations and open system, where each gets measured by whatever changes in its variables. There seem to be no agreement concerning the best or even the most sufficient measure of Enterprise performance. This is because many views exist as to what are the desirable outcomes of organizational effectiveness and because performance is often based on the theory and purposes of the research that is being performed (Carton & Hofer, 2006). Some use financial measures as a criterion to judge the success or failure of a decision or action. Performance measurement focuses on the internal processes to quantify the effectiveness and efficiency of an action with a set of metrics.

According to Richard et al., (2009) how an Enterprise performs is centered on three aspects of outcomes; financial performance in terms of profits, return on investment and ROA; performance of the product measured by market share, sales volume; and returns made on investments by the shareholders that includes total shareholder return and economic value added. There are, however, challenges in using these measures; for starters most managers are unwilling to allow researchers access their financial records, savings are inconsistent from year to year, environments are constantly changing which makes it difficult to compare the savings made years after.

1.1.3 Micro and Small Enterprises in Nairobi County, Kenya

The Micro and Small Enterprises Act No. 55 of 2012, state that “small enterprise” is defined as a firm, service, trade, business activity or industry with an annual turnover rate of between five hundred and five million shillings and whose employees range between ten and fifty with a total asset capacity and financial investment for the manufacturing sector ranges between ten to fifty million shillings; and for Service and farming enterprises, between five and twenty million shillings. According to Micro, Small and Medium Enterprises (MSME) Survey of 2016, medium enterprises are ventures that employ between 1-99 employees. The survey listed that the county governments had licensed roughly 1.56 million MSMEs across the country while about 5.85 Million MSME, ventures were found to be unlicensed. Most of these MSMEs operate in the service sector undertaking both retail and wholesale trade, repair of motorcycles and motor vehicles and food service and accommodation activities just to mention a few.

Data for the Kenya National Bureau of Statistics (KNBS, 2016), indicate that MSEs in Kenya contribute about 22.8% of total GDP output. With respect to the gross value

added, the contribution of SMEs was KSh 1,780.0 billion compared to KSh 5,668.2 billion for the entire economy. A recent report on the Economic Survey of Kenya (2016) depicts that more jobs continue to be created by the informal sector making it a fundamental sector for the economy. The report indicate that informal sector created over 700,000 new jobs in 2015 which totaled to about 85% of all new jobs in the country. Those employed include laborers working for households in factories, farms and transport sectors this demonstrating an overall significant growth of the sector.

In Kenya, Nairobi is one of the most populated counties. The main reason for choosing Nairobi County as the population of the study is because it is the country's capital and there is possibility of finding MSEs dealing in all types of innovations. A good number of this population earns a living by engaging themselves in micro and small businesses which are family owned and distributed all over the county. A number of family owned businesses are also located within the Central Business District because of its centrality and business opportunities that the City presents (Nairobi City Council, 2018). Few have permanent shelters while most of the businesses are either on temporary shelters or conducted by mobile traders who move from one place to another selling their products. Statistics have shown that very few of these businesses survive long enough to even reach their potential. The factors affecting performance, growth strategies and sustainability of micro and small business enterprises in Nairobi need to be established and strategies put in place to promote their performance.

1.2 Research Problem

A key assumption of most research work done on the improvement of operations has been technological innovation are directly proportional to improvements in performance

(Upton & Kim, 1999). Strategic management requires firms to put effective systems in place to prevent the occurrence of unpredictable events in order to sustain their operations and minimize the associated risks through technological innovation. The process of technological innovation and implementation forms a critical part in the growth of many nations. A change of past techniques and adoption of local technology similar to that of more advanced industrialized nations lead to indigenous technological innovation (Roehm & Sternthal, 2001).

Despite their potential to contribute to the world economy, MSEs face many challenges in the developed world. The MSE sector is highly volatile and is mostly associated with business shrinkage and closure (Berger, 2006) and thus the government has continued to make significant efforts to ensure the sustainability and growth of the MSE sectors. The high MSE mortality rate shows that MSEs have a limited ability to sustainable employment in the long-run thus they are responsible for the many job and wealth losses in the country (Ayyagari, 2003). According to Sessional Paper No. 2 of 2005, three out of five businesses find it hard to survive and fail within the first five years of operation implying that most SMEs fail despite their significant role in the economy (GoK, 2009). Most MSE's failure results to job losses, low liquidity, increased insecurity and subsequently economic growth downfall. Therefore, MSEs must adopt innovative measures in order to survive in the competitive global environment which could be done by continuously streaming innovation in order to gain competitive advantage (Robbins & Coulter, 2009).

Despite the potential benefits of technological innovation, its' debated on whether and how their use enhances organizational performance (Mabrouk & Mamoghli, 2010).

Worch and Truffer (2012) found that overall productivity and value maximization of the firm is enhanced by operations innovation. A study by Hafeez (2013) found a positive relationship between companies' profitability and value added innovativeness. Another study by Kiraka, Kobia and Katwalo (2013) established that process, product, positioning and paradigm types of innovation had a positive performance relationship in some business types of the micro and small enterprises. Odhiambo (2008) established that Standard Chartered Firm (Kenya) Limited bank has been able to successfully introduce various innovative strategies ranging from product, technological to customer care thus contributing enormously to its profitability over the years. Kiiyuru (2014) established that the commercial banks in Kenya had employed value creation through resource availability, customer satisfaction, retention and pricing in form of market innovation strategies.

Most of the studies done on technological innovation have concentrated on developed nations (Worch & Truffer, 2012; Hafeez, 2013). The few studies conducted locally have not been exhaustive as they have dealt with some aspects of innovation and different contexts (Kiraka, Kobia, & Katwalo, 2013; Odhiambo, 2008; Kiiyuru, 2014). The current study was motivated by these gaps in literature and sought to establish the influence of the different types of innovations (Product, service, process, marketing and IT) on performance of MSEs in Nairobi County. This study sought to fill this literature gap by answering these questions; what are the technological innovations in the Kenyan micro and small enterprises? What is the level of adoption of technological innovation by micro and small enterprises in Nairobi County, Kenya? And what is the effect of technological innovation on performance of micro and small enterprises in Nairobi County, Kenya?

1.3 Research Objectives

The study's objective was to examine the effect of technological innovation on enterprise performance of micro and small enterprises in Nairobi County, Kenya. The specific objectives of the study are:

- i) To determine the level of adoption of technological innovation among micro and small enterprises in Nairobi County, Kenya.
- ii) To establish the effect of technological innovation on firm performance of micro and small enterprises in Nairobi County, Kenya.

1.4 Value of the Study

The study may contribute to future references for future academicians. The study may identify further areas of research by highlighting related topics critiquing to identify research gaps. The study contributes significantly to technological innovation in the economy.

Policy makers will be enlightened by the study findings, by showing them how technological innovation influence enterprise performance of MSEs and thereby identify mechanisms to be utilized by the regulators to improve performance of such firms which form the framework for achievement of economic growth and development goals of vision 2030. The study will also be geared towards helping firms which are yet to adopt technological innovation. The management of these firms will be able to determine the technological innovation suitable for them to enhance enterprise growth and performance.

Findings from the study will also form a foundation for implementing an effective technological innovation practice. The study would help the Government of Kenya in formulation and implementation of policies for operational efficiency. Through the results of this study, the MSEs would find the benefits realized and how more benefits can be realized for optimal operational efficiency.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter entails theoretical literature review, technological innovation and its relationship with enterprise performance. It also gives a presentation of the empirical literature review that include local and global studies, enterprise performance and finally the conceptual framework.

2.2 Theoretical Review

The study was based on three theories. These are; RBV theory of the firm, the diffusion of innovation theory and TAM.

2.2.1 Resource Based View Theory

This hypothesis contends that maintained upper hand and enhanced execution by a firm might be acknowledged by misusing profitable, uncommon, non-substitutable and incompletely imitable assets (Hart, 1995). A significant asset or heap of assets enables a venture to bridge openings and diminish dangers in its condition. An uncommon asset or heap of assets is one that isn't controlled by countless. A non-substitutable asset or heap of assets is one for which a proportional asset can't undoubtedly be made by contending firm or firms. An incompletely imitable asset or heap of assets is one that is hard to imitate or one that can be repeated at a critical cost (Hart, 1995). Ignorant (1983) records these assets to incorporate all abilities, resources, hierarchical procedures, learning and data controlled by a firm.

Assets can just extend the firm esteem in the event that they are utilized in a way that thinks about the dynamic outside business condition (Sirmon, Hitt and Ireland, 2007). The assets can be sorted as substantial or elusive (Mentzer, Min and Bobbitt, 2004) Wagner (2006) contends that technological innovation is defined as the desirable practices acquired from efficient technologies. Desirable practices will support the technological functions in the delivery of services of high quality and sustain superior performance therefore technological innovation frameworks are resources that are within RBV since it causes service delivery and performance.

This study agrees that higher level of bonding between technological innovation and sustainability is directly connected with an organization's performance and profitability. Under RBV by exploiting technological innovation practices, government agencies build capabilities for improved organizational performance. The theory is applicable to the research as it recognizes organizational processes, close working relationships and knowledge sharing and as resources that could be leveraged on to attain improved organizational performance.

2.2.2 Diffusion of Innovation Theory

Diffusion of Innovation refers to the communication of an idea which is considered to be novel to the members of a social system through certain preferred channels (Rogers, 2003). The spread of new ideas is impacted by four variables which are: the actual innovation, social systems, time and communication channels. Of utmost importance is innovation has to gain acceptability in a wide area in order to be sustainable. According to Fisher (1971), adoption of innovation when mapped in the long run forms an S shaped

curve. This curve begins with the innovators, early adopters, early and late majority and finally the laggards.

How successful an innovation will be stems from the resolutions put forward by the social systems through five defined steps which are; knowledge: such as innovation awareness and continuous learning regarding it; persuasion which means willingness to have detailed knowledge concerning the innovation; resolution, that is, consideration of the advantages and disadvantages of the innovation and choice of whether to adopt the innovation; application which is an examination of how useful the innovation will be and finally confirmation, which is eventual decision on the continual use of the innovation (Rogers, 2003). The diffusion of innovation model though falls short of explaining the importance of the capability and the dynamics of different inter-connected trading partners and the influence of power between trading partners (Hart & Saunders, 1997).

Rogers (1995) describe communication channel as a critical contributor to the success of adoption of new innovation in the organization. As an effective communication channel creates prior awareness of the new technology, the trading partners need to work together to ensure the success of technological innovation. This will be determined by the inter-connected industry the organization is in and how influential that organization is to its trading partners (Lundblad, 2003). This theory has guided the study of the adoption of various technological innovations in businesses.

2.2.3 The Technology Acceptance Model (TAM)

This model clarifies the way clients embrace/acknowledge and utilize an innovation. TAM was found in 1989 by Davis. This model asserts that once a client is given an

alternative innovation, some aspects influence their choices on the means and time of utilization. This incorporates its apparent convenience and seen helpfulness. TAM embraces settled causal chain of genuine conduct convictions, goal and disposition. This was produced by social clinicians from the hypothesis of contemplated activity. In Davis' study, two vital parts are recognized; seen convenience and seen helpfulness (Davis, Pallister & Foxall, 2002).

In other studies regarding technology, TAM is widely adopted and greatly contributes to the development of a prediction of an individual's usage of technology (Fishbein & Ajzen, 2010). Perceived ease of use influences the perceived usefulness and the intention for adoption (Davis, 1989). Despite TAM being an important source for theoretical framework in the study of adoption and use of technology it has many limitations which include the initial purpose designing the model which is parsimony and generality (Dishaw & Strong, 1999), not taking into consideration non-organizational setting of the organization (Davis & Venkatesh 2000), and ignoring the factors which moderate the adoption of ICT (Sun & Zhang, 2006).

This theory has affected research in acceptance of technology. In this exploration, TAM will be utilized as a part of three distinctive routes, specifically to discover how the utilization of technology enhances hierarchical administration conveyance to natives, how staff technology preparation impacts the utilization of technology in MSEs and how the accessibility of technology impacts the utilization of technological innovation among MSEs.

2.3 Empirical Literature Review

The significance of innovation and how influential it is to the performance of an organization was depicted by the study conducted by Furst, Lang, and Nolle (2012) who considered several companies from five countries. From the findings of this study the differences in performance of firms in the different countries was determined by their innovative capacity: France, England, Germany, United States and Japan. Kotler (2003) in his study of the relationship between innovation and performance, by examining Sony Company, showed that the market share for a front runner in innovation expanded significantly by way of many new products to clients.

Gerstenfield and Wortzel (2007) did an analysis of the link between the use of innovation technologies that are internet-based, various types of innovation and the financial performance on firm level. The data used was selected from European enterprises totaling 7,302. The findings from the empirical investigation showed that internet-based innovation technologies were significant in enabling innovation in the year 2003. The results also showed that all the technological innovation whether internet-enabled or non-internet-enabled product contributed to positive turnover and growth in employment. Additionally, it showed that higher profitability is mostly the result of the innovative activity of the firm.

The study by Mabrouk and Mamoghli (2010) asserts that as the innovation process continues overtime, banks considered to be innovative will be able to continue enjoying attractive returns on the newer or improved products. However, supernormal profits will decrease following widespread adoption of the new technologies. Grundiche (2004) argued that for a firm to ensure that it remains competitive in a dynamic environment and

achieve its set objectives of profitability, sales volume and market share, it must make efforts to continually improve products and product lines to satisfy customer desires and needs that keep changing. According to Mabrouk and Mamoghli (2010), the reasons that drive new product development as mentioned by most business persons include growth in the corporation, diversification, and the search for a competitive edge over competition. They further add that the main reason for developing new products is to explore other new opportunities since new products enhance the firms' survival in the long run growth.

Nwokah, Ofoegbu and Elizabeth (2009) did a study on the variables of product development such as the quality of the product mix which showed a positive correlation to corporate performance variables of sales volume, customer loyalty and profitability.

Neely (2002) turnover in terms of sales for firms embracing innovation was faster than firms that do not embrace innovation. They found that there exists a significant association between the innovative sales share and the firm's change in sales turnover.

Chesbrough (2010) found that the effects of innovation were reflected in increased range of goods and services, improved quality of goods and services, and process-oriented outcomes such as improved production flexibility and increased production capacity.

Firm performance is said to be the outcome that is achieved when a firm meets its goals (Wladawsky-Berger, 2008). Conventionally, the variation in firm's performance is linked to business structure (Ruttan, 1984). The neo-classical economic theory however sees business growth as the process of achieving the minimum point of the average cost. Ruttan (1984) came up with a theory that was resource-based where a business's performance is reliant on the firm resources and abilities the business has to source sustainable market competitive advantages and argues that for firms to grow, they must

be able to mobilize access and position resources. How a business adopts and uses different strategies also determines the performance to each business, its own strategy; therefore performance is concerted in its strategy (Wladawsky-Berger, 2008).

Hill and Utterback (2009) mentioned that the driver of change and development in societies that are associated with increasing levels of employment growth had a strong export market position, productivity, trade and improvement in the quality of life and trade. The technological innovation process however comes with some complexities in the process of interacting with industrial factors; studies on the concept have proven to be difficult. However, Lall (1980) stressed that technological innovation is mostly being undertaken in the developing country's modern sectors especially those that have been in the manufacturing industry for long and with broad -based capital good sectors. These innovation bring change in a variety of ways including increased efficiency and productivity from the simplicity of learning through practicing, advancements in design, construction and management of advanced industrial processes and proving the ability to come up with technologies in the averagely high areas.

Additionally, Worch and Truffer (2012) studied how IT innovation impacts service environments and found that the adoption of technology is associated with a given degree of suspicion but with expectations that it will lead to the improvement of performance and service delivery. It was also noted that the decision to outsource technological services capabilities is considered as passing the blame for failure of services in the public sector.

Kiarie (2012) specifies service innovation as a new or remarkably improved service concept that is adopted. Product innovation is a key strategic approach for creating and

maintaining competitive advantage in the dynamic, global economic environment. It's used to create new products, re-invigorate existing products and solve product related defects and difficulties with customers. Hart (1996) posits that radically changed and improved products are very important for long term business growth. According to Kiraka (2013) product innovation is a major source of competitive advantage in small enterprises.

Davenport (2013) identifies the drivers of process innovation as: industry competitors, customers, finances, opportunity and culture. Competition from industry competitors is one of the main drivers of process innovation since being able to make processes quicker and more efficient results in lowered costs and shorter cycle times hence products can be made available to consumers quicker and cheaper. Customers spur process innovation especially in the service sector. Customers seeking credit would choose the bank that processes loans quicker than the one that requires them to wait for weeks.

2.4 Summary of Literature Review

Three theories have been discussed in this theoretical review. The theories are namely: the resource based view theory of the firm, the diffusion of innovation theory and the technology acceptance model. Some of the key measures of technological innovation and Enterprise performance have also been discussed in this section. Several empirical studies have been conducted both internationally and locally on technological innovation and Enterprise performance and discussed in this chapter.

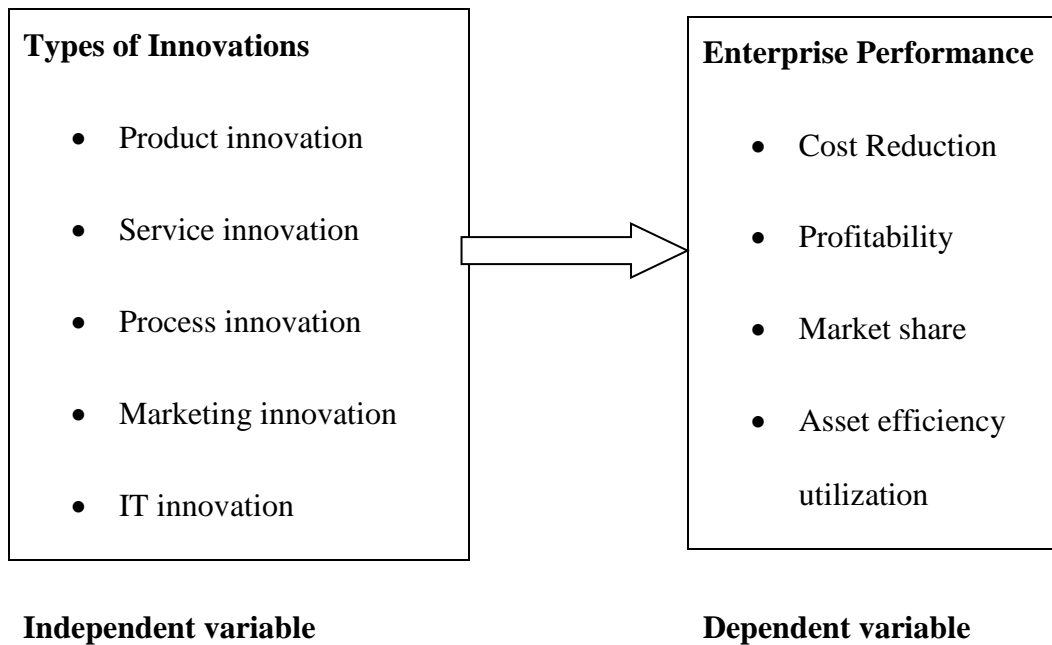
The above literature review indicates that little research has been done in the establishment of the relationship between technological innovation and Enterprise performance thus more studies need to be done. This study seeks to clearly demonstrate

the association between technological innovation and Enterprise performance among MSEs in Nairobi County, Kenya after which the conclusions will be dispelled after obtaining empirical evidence from the research. Local studies done (Kiraka, Kobia, & Katwalo, 2013; Odhiambo, 2008; Kiiyuru, 2014) are not conclusive in their findings and it is this gap that the current study intends to fill.

2.5 Conceptual Framework

This is a diagrammatic presentation of the experiential, observational and the synthetical aspects system that is being established. It outlines key concepts and variables and the linkages between them. The study strived to establish the influence of technological innovation on enterprise performance of MSEs in Nairobi County, Kenya.

Figure 2.1: The Conceptual Framework



Source: Author (2018)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes methods of research to be applied to objectively determine the effects of technological innovation on enterprise performance among MSEs in Nairobi County, Kenya. It also shows the research design, the population of study, data collection criteria and data analysis.

3.2 Research Design

Khumar (2005) described research design as that method that is procedurally acquired by the researcher and that which enables the researcher to be able to answer questions accurately, validly, objectively, and economically. According to Wanyama and Olweny (2013), a research design aims at improving the ability of the research in conceptualizing an operational plan in order to be able to embark on the various techniques available and required tasks for the completion of the study while at the same time ensuring that the procedures used are sufficient enough to acquire valid, objective and precise responses to the research questions.

Descriptive cross-sectional research design was used for the study. A descriptive study aims at finding out the what, where and how of a phenomenon. The appropriateness of this design is that it allowed the researcher to utilize both quantitative and qualitative data so as to determine the influence of technological innovation on the performance of MSEs. Descriptive cross sectional design was used by the researcher to gather information, summarize, present and interpret it in order to obtain more clarification on issues.

3.3 Population of the Study

Population is defined as a group of individuals or entities to which the findings of the sample are to be generalized (Cooper & Schindler, 2008). A target population refers to a collection of elements which we want to make deductions (Cooper & Schindler, 2008). The population for this study comprises of MSEs from Nairobi County. The rationale for selecting Nairobi County was because it is the country's capital and there is possibility of finding MSEs dealing with all the types of innovations. According to records from the Nairobi County Council, there are 8259 registered MSEs (Nairobi County Council, 2017) with 1539 MSEs found within the Nairobi's Central Business District. The study targeted MSEs that have been in operation for more than five years at the time of the study. The target population consisted of MSEs from different sectors including general trade, transport and communication, agriculture, hospitality, professional and technical, education and entertainment and manufacturing. The population distribution that shows classification of MSEs is presented in Table 3.1 below.

Table 3.1: Population Distribution

Classification of SMEs	Population
General Trade	247
Transport and Communications	231
Agriculture	211
Hospitality	205
Professional and Technical	217
Education and Entertainment	207
Manufacturing	221
TOTAL	1539

Source: Nairobi County Council, 2018

3.4 Sampling Design and Sample Size

Stratified sampling technique was adopted where the population was divided into seven strata depending on the sector the firm is operating in. Simple random sampling methodology was then applied within each stratum to choose a sample within the population. Stratified sampling enabled the researcher to representatively sample each subgroup in the population hence higher statistical precision. Simple random sampling avoided biased selection and ensured that each object had an equal chance of selection hence satisfying the statistical regularity principle, which proposed that random selection of a sample implies that it possesses similar attributes as the entire population. Since stratified sampling technique has high statistical precision, it requires a small sample size hence the study took 10% of the target population of 1539 hence obtaining a sample of 155 MSEs as respondents.

Table 3.2: Sample Size

Classification of SMEs	Population	Sample size
General Trade	247	25
Transport and Communications	231	23
Agriculture	211	21
Hospitality	205	21
Professional and Technical	217	22
Education and Entertainment	207	21
Manufacturing	221	22
TOTAL	1539	155

Source: Nairobi County Council, 2018

3.5 Data Collection

Primary data was used and it was acquired by use of structured questionnaires using the Likert Scale. The targeted respondents in this study were owners and representatives of

the MSEs. This was because they are involved in the management of the enterprises and have a broad understanding of the affairs of their business.

The researcher administered the questionnaire to one respondent in each enterprise giving a total of 150 respondents. The questionnaire consisted of open-ended and close-ended questions. Close-ended questions were used in the collection of structured responses to allow for the recommendations that are more tangible. The research instrument was personally administered by the researcher so as to ensure that all the questionnaires were received by the respective respondents and kept a register to ensure that all were returned.

3.6 Data Analysis

The primary data collected by the questionnaire was checked, edited and coded. The coded data was then inputted into SPSS and analyzed using descriptive and inferential statistics. Descriptive analysis involved computation of mean, frequency distribution, standard deviation and percentages were carried out to determine frequencies and percentage distributions. Correlations and regression analysis were calculated to draw inferences to the entire population.

Multiple linear regression model was used to analyze the quantitative data since it involved one dependent variable and multiple independent variables. This was used to analyze if there's a connection between one dependent variable and one or more independent variables. The multiple regression model used was represented as:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

In which;

Y= Firm performance

α = Constant Term; it is the Y value when all the predictor values are zero

$\beta_1, \beta_2, \beta_3$ and β_4 = Beta Coefficient of variable i which measures whether there is responsiveness of Y to change in i

X_1 = Product/service innovation

X_2 = Process Innovation

X_3 = Market innovation

X_4 = Information technology innovation

ϵ = Error term

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter entails data analysis, findings and interpretation. Results are presented in form of diagrams and continuous prose form. The data is in line with the research objectives.

4.2 Questionnaire Response Rate

The researcher administered 155 questionnaires. However, only 136 respondents responded positively. This reveals an overall successful response rate of 87.7%. According to Babbie (2004), return rates of 50% are acceptable to analyze and publish, 60% is good and 70% is very good. Based on these 87.7% response rate is sufficient

4.3 Background Information

The study was seeking to establish background information of the respondents and the business. With regard to the respondents, they wanted to find out the position held by the respondents as well as their level of education. On the other hand, the study sought to find out the type of business, years of operation, number of employees, and number of branches.

4.3.1 Position of Respondents

Results in Figure 4.1 show that 34% of the respondents were supervisors, 33% were owners while 33% were managers. The reason for the lesser number of owners can be

explained by the fact in most cases owners entrust the operations of their businesses to employees.

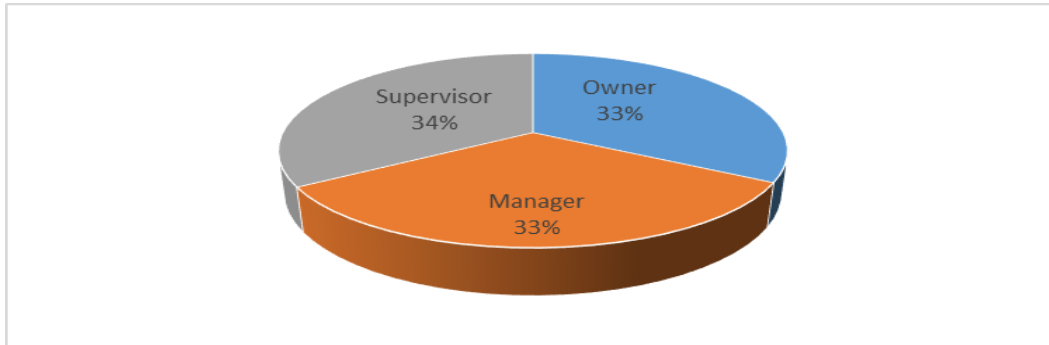


Figure 4.1: Position of Respondents

4.3.2 Level of Education

Results in figure 4.2 show that most (46%) of the respondents had diploma certificates, 32% had bachelor's degree certificate, 17% has high school certificates while only 5% had post graduate certificates. The dispersion in the education qualification can be explained by the fact that MSEs operate across all sectors, some of which require higher educational qualification than others.

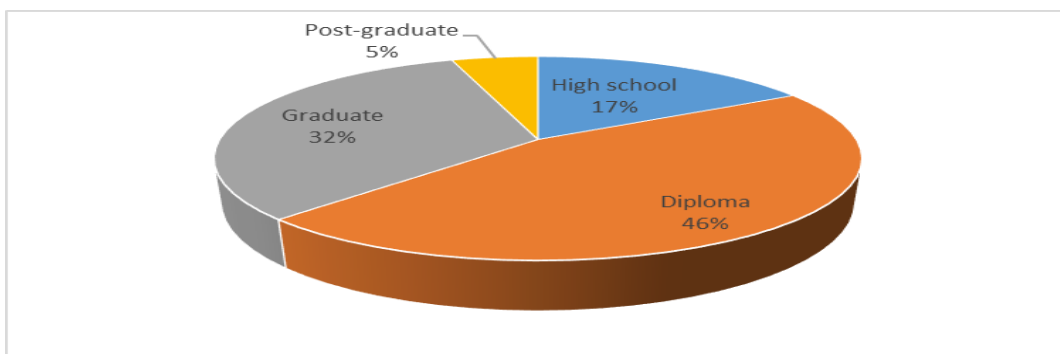


Figure 4.2: Level of Education of Respondents

4.3.3 Type of Business

Results in figure 4.3 show that slightly above half (51%) of the business engaged in general trade, 39% were in the service industry while 10% were in the manufacturing sector.

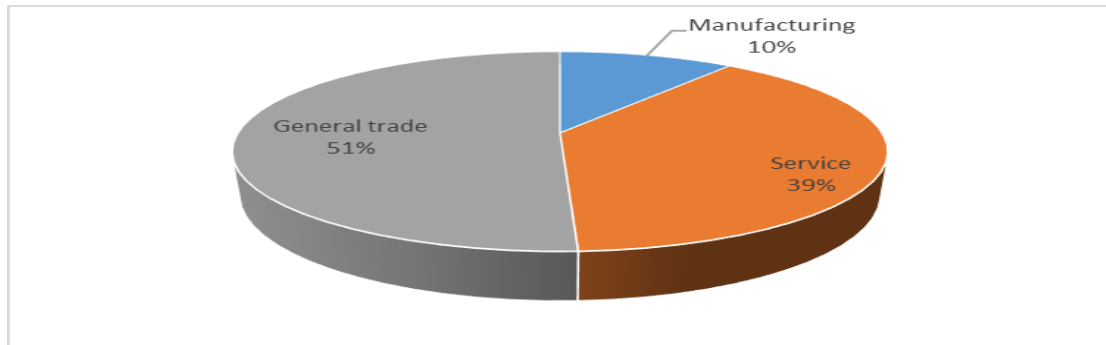


Figure 4.3: Type of Business

4.3.4 Years of Operation

Results in Figure 4.4 show that 40.4% of the businesses had been operation for a period of 1 – 5 years, 33.1% were operational for less than 1 year while 26.5% had been in operation for more than 5 years. The less years of operation for most of the MSEs can be explained the fact most MSEs don't survive the early stages of growth due to various challenges.

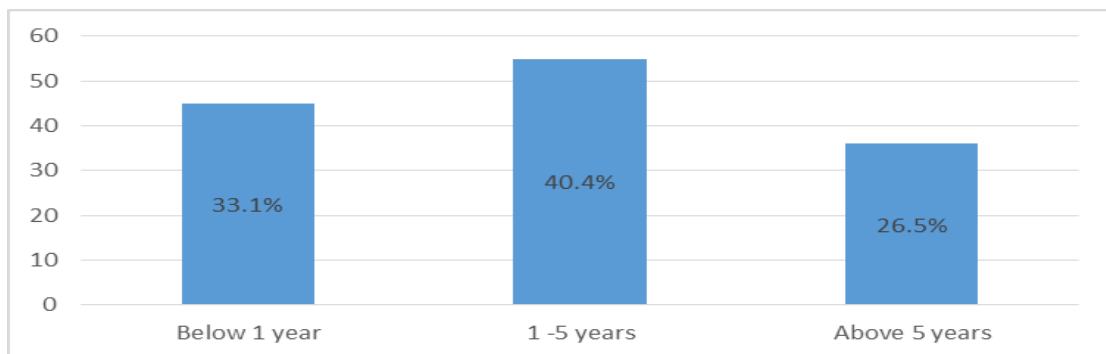


Figure 4.4: Years of Operation

4.3.5 Number of Employees

Results in Figure 4.5 show that 48.5% of the businesses had employed less than 10 employees, 36% had employed between 10 – 25 employees while 15.4% had employed more 25 employees.

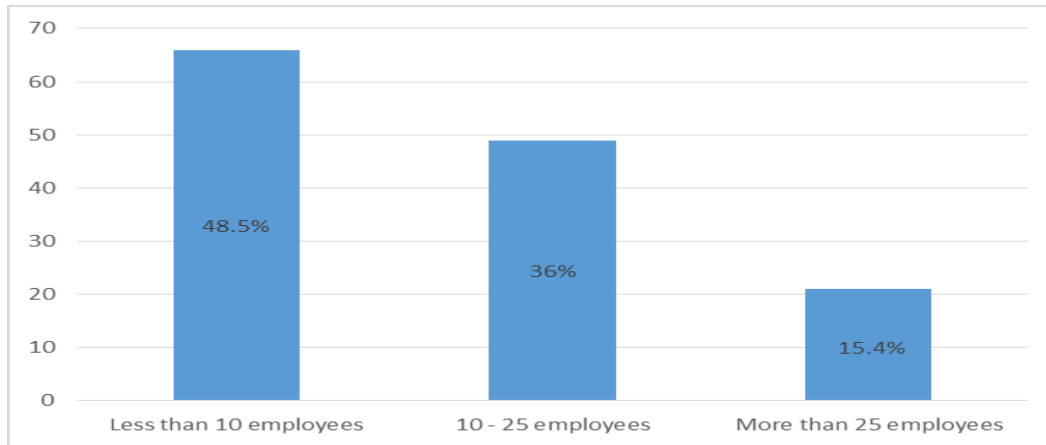


Figure 4.5: Number of Employees

4.3.6 Number of Branches

Result in Table 4.1 reveal that 46.3% of the businesses had less than 5 branches, 32.4% had between 5 -10 branches while 21.3% had more than 10 branches. This can be explained by the fact that most businesses are in their early stages of growth.

Table 4.1: Number of Branches

Number of branches	Frequency	Percent
Less than 5	63	46.3
Between 5 -10	44	32.4
More than 10	29	21.3
Total	136	100

4.4 Descriptive Statistics

This section gives a presentation of the descriptive results on product innovation, process innovation, market innovation, information technology innovation and firm performance of MSEs.

4.4.1 Product Innovation

The researcher was seeking to determine the level of product innovation at the MSEs. Results in Table 4.2 reveal that 57.4% of the respondents agreed that in new product and service introduction, their company is often first-to-market, 89% agreed that new products and services are often perceived the best by customers while 61.8% agreed that new products and services in their company often take us up against new competitors. Results also reveal that 59.5% of the respondents stated that in comparison with competitors, their company has introduced more innovative products during past 3 years, 83.1% agreed that they manage to cope with market demands and develop new products quickly while 55.9% agreed that they continuously improve old products and raise quality of new products. On a five point likert scale the mean was 3.8 implying that the respondents agreed to most of the statements. The findings are concurrent with those of Kiarie (2012) who asserted that product innovation is a key strategic approach for creating and maintaining competitive advantage in the dynamic, global economic environment.

Table 4.2: Product Innovation

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean
In new product and service introduction, our company is	4.4%	6.6%	31.6%	36.8%	20.6%	3.6

often first-to-market.						
New products and services are often perceived the best by customers.	2.2%	4.4%	4.4%	33.1%	55.9%	4.4
New products and services in our company often take us up against new competitors.	0.0%	4.4%	33.8%	53.7%	8.1%	3.7
In comparison with competitors, our company has introduced more innovative products and services during past 3 years.	5.1%	2.2%	33.1%	54.4%	5.1%	3.5
We manage to cope with market demands and develop new products quickly.	0.0%	0.0%	16.9%	31.6%	51.5%	4.3
We continuously improve old products and raise quality of new products.	13.2%	2.2%	28.7%	45.6%	10.3%	3.4
Average						3.8

4.4.2 Process Innovation

The researcher was seeking to determine the level of process innovation at the MSEs. Results in Table 4.3 reveal that 82.3% of the respondents agreed that development of new channels for products and services offered by their corporation is an on-going process, 72.7% agreed that new business strategies and services are normally worthwhile if they improve productions (new machinery, new process among others) while 82.3% agreed that their firm rewards employees in terms of their productivity. Results also reveal that 55.2% of the respondents stated that their firm conducts internal training of its employees upon introduction of new machinery/ processes, while 61.8% agreed that employees attend seminars, workshops, conferences with intention to acquire or improve their skills. On a five point Likert scale the mean was 3.9 implying that the respondents were agreeing with most of the statements. The findings agree with those of Kiarie (2012) who specified that service innovation as a new or remarkably improved service concept that is adopted by many companies with an aim of improving their profitability.

Table 4.3: Process Innovation

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean
Development of new channels for products and services offered by our corporation is an on-going process.	0.0%	0.0%	17.6%	41.9%	40.4%	4.2
New business methods and services are always worth if they improve productions (new machinery, new process among others).	0.7%	0.0%	26.5%	30.1%	42.6%	4.1
The firm rewards employees in terms of their productivity.	0.0%	0.0%	17.6%	40.4%	41.9%	4.2
The firm conducts internal training of its employees upon introduction of new machinery, processes.	14.0%	2.2%	28.7%	43.4%	11.8%	3.4
Employees attend seminars, workshops, conferences with intention to acquire or improve their skills.	16.2%	17.6%	4.4%	18.4%	43.4%	3.6
Average						3.9

4.4.3 Market Innovation

The researcher was seeking to determine the level of market innovation at the MSEs. Results show that 61.7% of the respondents consented that in marketing innovations their firm is better than competitors while 94.9% agreed that they deal with customers' suggestions or complaints urgently and with utmost care. Results also reveal that 76.5% of the respondents stated that their firm has introduced new marketing approaches (online marketing, and e-business) while 75% agreed that their firm manages to deliver special products flexibly according to customers' orders. On a five point likert scale the mean was 3.9 implying that the respondents were agreeing with most of the statements. The findings also agree with those of Chesbrough (2010) who found that the effects of

innovation were reflected in increased range of goods and services, improved quality of goods and services, and process-oriented outcomes such as improved production flexibility and increased production capacity.

Table 4.4: Market Innovation

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean
In marketing innovations (entering new markets, new pricing methods, new distribution methods, etc.) our company is better than competitors.	17.6%	17.6%	2.9%	17.6%	44.1%	3.5
We deal with customers' suggestions or complaints urgently and with utmost care.	2.2%	2.2%	0.7%	62.5%	32.4%	4.2
Introduction of new marketing approaches (online marketing, e-business).	4.4%	15.4%	3.7%	59.6%	16.9%	3.7
Our firm manages to deliver special products flexibly according to customers' orders.	4.4%	19.9%	0.7%	35.3%	39.7%	3.9
Average						3.8

4.4.4 Information Technology Innovation

The study sought to establish the level of information technology innovation at the MSEs. Results in Table 4.5 reveal that 69.9% of the respondents agreed that their firm makes use of radio frequency identification systems (RFID) while 80.8% agreed that their firm has automated storage and retrieval system. Results also reveal that 66.2% of the respondents stated that their firm makes use of global positioning systems while 83.8% agreed that electronic data interchange is widely practiced in their firm. On a five point likert scale the mean was 3.9 implying that the respondents were agreeing with most of the statements. These findings also agree with those of Worch and Truffer (2012) who studied how IT innovation impacts service environments and found that the adoption of

technology is associated with a given degree of suspicion but with expectations that it will lead to the improvement of performance and service delivery.

Table 4.5: Information Technology Innovation

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean
Our firm makes use of radio frequency identification systems (RFID).	1.5%	0.0%	28.7%	39.0%	30.9%	4.0
Our firm has automated storage and retrieval system.	5.1%	0.0%	14.0%	25.7%	55.1%	4.3
Our firm makes use of global positioning systems.	0.0%	0.0%	33.8%	35.3%	30.9%	4.0
Electronic data interchange is widely practiced in our firm.	0.0%	2.2%	14.0%	52.9%	30.9%	4.1
Average						4.1

4.4.5 Firm Performance

The study sought to establish the firm performance of the MSEs. Results in Table 4.6 reveal that 65.4% of the respondents stated that adoption of technological innovation has resulted to improvement in cost reduction, 92.6% posted that adoption of technological innovation has resulted to improved productivity while 65.4% agreed that adoption of technological innovation has resulted to improved flexibility. Results also reveal that 86% of the respondents stated that adoption of technological innovation has resulted to improved profitability, 87.5% reiterated that adoption of technological innovation has resulted to improved market share while 86.8% stated that adoption of technological innovation has resulted to an improvement in asset efficiency utilization. On a five point Likert scale the mean was 4.0 implying that the respondents were agreeing with most of the statements. These findings are consistent with the assertions of Drucker (2001) who stated that technological innovation is part of strategy implementation that enhances enterprise performance through esteem expansion and hazard decrease. The findings are

also consistent with those of Yilmaz, Alpan and Ergun (2005) who recognized technological innovation as critical enablers for enterprise's performance by creating value in the undeniably unpredictable and quickly evolving environment.

Table 4.6: Firm Performance

Statement	Greatly Reduced	Reduced	Constant	Improved	Greatly Improved	Mean
Cost reduction	2.2%	0.0%	32.4%	42.6%	22.8%	3.8
Productivity	0.0%	0.0%	7.4%	37.5%	55.1%	4.5
Flexibility	0.0%	0.0%	34.6%	50.7%	14.7%	3.8
Profitability	7.4%	0.0%	6.6%	79.4%	6.6%	3.8
Market share	5.1%	0.0%	7.4%	33.1%	54.4%	4.3
Asset efficiency utilization	6.6%	0.0%	6.6%	75.0%	11.8%	3.9
Average						4.0

4.5 Inferential Statistics

Inferential analysis was carried out to obtain correlation results, model of fitness, and ANOVA and regression coefficients.

4.5.1 Correlation Analysis

Correlation analysis' outcome is given in the table below. The results presented in the Table 4.7 shows that product innovation and firm performance have a positive and significant association ($r=0.235$, $p=0.006$). It further reveals that process innovation and firm performance have a positive and significant association ($r=0.250$, $p=0.003$). Results also showed that market innovation and firm performance have a positive and significant association ($r=0.122$, $p=0.015$). It was further established that information technology innovation and firm performance have a positive and significant association ($r=0.222$, $p=0.009$). This implies that adoption of technological innovation results to improved firm

performance. These findings are supported by the resource based theory which postulates that higher level of bonding between technological innovation and sustainability is directly associated with an organization’s performance and profitability. Under RBV exploitation of technological innovation practices results to improved organizational performance.

Table 4.7: Correlation Matrix

Variable		Firm Performance	Product Innovation	Process Innovation	Market Innovation	IT Innovation
Firm Performance	Pearson Correlation	1				
	Sig. (2-tailed)					
Product Innovation	Pearson Correlation	0.235	1			
	Sig. (2-tailed)	0.006				
Process Innovation	Pearson Correlation	0.250	0.186	1		
	Sig. (2-tailed)	0.003	0.030			
Market Innovation	Pearson Correlation	0.122	0.109	0.771	1	
	Sig. (2-tailed)	0.015	0.205	0.000		
IT Innovation	Pearson Correlation	0.222	0.139	0.637	0.689	1
	Sig. (2-tailed)	0.009	0.106	0.000	0.000	

4.5.2 Regression Analysis

Results in Table 4.8 above show that the four types of innovations (product, process, market and IT) were sufficient predictors in explaining firm performance of MSEs in

Nairobi County. This is confirmed by a R^2 value of 0.680 implying that the four innovations explain 68% of the variations in the firm performance of MSEs in Nairobi County.

Table 4.8: Model Fitness

Indicator	Coefficient
R	0.825
R Square	0.680

Results in Table 4.9 indicate that the overall model was statistically significant as supported by an F statistic of 4.73 and a p value of 0.001. Further, the results imply that the independent variables are good predictors of MSEs firm performance.

Table 4.9: Analysis of Variance

Indicator	Sum of Squares	Df	Mean Square	F	Sig.
Regression	2.527	4	0.632	4.73	0.001
Residual	17.497	131	0.134		
Total	20.024	135			

Regression coefficients results in Table 4.10 show that there is a positive and significant relationship between product innovation, process innovation, market innovation and IT innovation and MSEs firm performance in Nairobi County. This was supported by beta coefficients of 0.149, 0.234, 0.306 and 0.276 respectively. These results show that adoption of product innovation by a unit would result to improved firm performance by 0.149 units. These findings are consistent with those of Kiraka (2013) who posited that product innovation is a major source of competitive advantage in small enterprises.

These results also show that adoption of process innovation by a unit would cause improved firm performance by 0.234 units. These findings agree with those of Davenport (2013) who identifies the drivers of process innovation as: industry competitors,

customers, finances, opportunity and culture. Further, these results show that adoption of market innovation by a unit would result to improved firm performance by 0.306 units. These findings agree with those of Furst, Lang, and Nolle (2012) who considered several companies from five countries. From the findings of this study the differences in performance of firms in the different countries was determined by their innovative capacity.

Results also revealed that information technology innovation by a unit would result to improved firm performance by 0.276. These findings agree with those of Gerstenfield and Wortzel (2007) who analyzed the link between the use of innovation technologies that are internet-based and the financial performance on firm level. The results showed that all the technological innovation whether internet-enabled or non-internet enabled product contributed to positive turnover and growth in employment.

Table 4.10: Regression of Coefficients

Variable	B	Std. Error	T	Sig.
(Constant)	2.325	0.395	5.886	0.000
Product Innovation	0.149	0.068	2.195	0.030
Process Innovation	0.234	0.106	2.195	0.030
Market Innovation	0.306	0.124	3.284	0.001
IT Innovation	0.276	0.224	2.126	0.002

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

In which;

Y = Firm performance

α = Constant Term

$\beta_1, \beta_2, \beta_3$ and β_4 = Beta Coefficient of variable i which measures whether there is responsiveness of Y to change in i

X_1 = Product/service innovation

X₂= Process Innovation

X₃= Market innovation

X₄= Information technology innovation

ε=Error term

Hence the final model is:-

Firm Performance = 2.325 + 0.149 *Product Innovation* + 0.234 *Process Innovation* +

0.306 *Market Innovation*+ 0.276 *Information Technology Innovation*

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter outlines the summary of the findings, the conclusions and the recommendations. It's done in line with the objectives of the study.

5.2 Summary of Findings

This section presents a summary of the findings from the analysis done in line with the objectives of the study.

5.2.1 Adoption of Technological Innovation among MSEs

The first objective was to determine the level of adoption of technological innovation among MSEs in Nairobi County, Kenya. Results revealed that MSEs within Nairobi County have adopted technological innovation. Specifically, the study had adopted product, process, market and information technology innovation.

Adoption of product innovation was characterized by introduction of new product and service, being first-to-market, getting their customers to perceive their new products and services as the best, obtaining a competitive edge through new products and services, introduction of innovative products, coping with market demands and developing new products, and continuously improving old products and raise quality of new products.

Adoption of process innovation was characterized by continuous development of new channels for products and services, introduction of new business methods and services with an aim of improving productions, rewarding employees in terms of their productivity, having internal training for employees upon introduction of new

machinery/processes, and facilitation of employees to attend seminars, workshops, conferences with intention to acquire or improve their skills.

Adoption of marketing innovation was characterized by use of unique marketing strategies such as entering new markets, new pricing methods, and new distribution methods which gives the MSEs a competitive edge, dealing with customers' suggestions or complaints urgently and with utmost care, introduction of new marketing approaches (online marketing, and e-business) and delivering of special products flexibly according to customers' orders. Adoption of information technology innovation was characterized by use of radio frequency identification systems (RFID), automation of the storage and retrieval system, use of global positioning systems, and use of electronic data interchange.

5.2.2 Effect of Technological Innovation on Firm Performance of MSEs

The second aim of the research was to determine the effect of technological innovation on firm performance of MSEs in Nairobi County, Kenya. Results showed that technological innovation had affected the performance of MSEs. The effect was inform of cost reduction, improved productivity, improved flexibility, improved profitability, improved market share and improved asset efficiency utilization.

Regression results showed that product, process, market and information technology innovations had a positive and notable connection with the performance of MSEs confirmed by beta coefficients of 0.149, 0.234, 0.306 and 0.276 respectively. These results show that adoption of product innovation by a unit would result to improved firm performance by 0.149 units. These results also show that adoption of process innovation

by a unit would result to improved firm performance by 0.234 units. Further, these results show that adoption of market innovation by a unit would result to improved firm performance by 0.306 units while adoption of information technology innovation by a unit would result to improved firm performance by 0.276.

5.3 Conclusion

The study concluded that MSEs had adopted technological innovation. Technological innovation encompassed product, process, market and information technology innovations. The adoption of this technological innovation gave the MSEs a competitive edge which boosted their performance.

The study also concluded that the effect of technological innovation on the performance of MSEs was positive. This was realized after establishing that product innovation, process innovation, market innovation and information technology innovation had a positive and significant relationship with the performance of MSEs. This meant that adoption of technological innovation resulted to better firm performance.

5.4 Recommendations

The study recommended that MSEs should make adoption of technological innovation a priority as it enhances firm performance. The MSEs should first of all endeavor to find out what types of technological innovation are suitable for them so that they do not end up investing wrongly. By so doing they can manage to maximize on the benefits accruing from technological innovation.

The study also recommend that, on identification of the type of technological investment that is suitable for their type of business, they should be keen to identify the specific

aspects so as to boost their performance. For instance, in the case of market innovation, MSEs should do their due diligence to identify the type of marketing innovation that will work for them since what works for one type of business is not applicable for all types of businesses. Further, the study recommended that the government should come up with forums that create awareness among the MSEs owners on the importance of adoption of technological innovation. This would help to increase the life span of most MSEs that would otherwise not go past the first phase of growth.

5.5 Limitations of the Study

The study was constrained by the inability to find the founders of SMEs who would have been most appropriate to fill the questionnaires as they have a better understanding of their companies. In cases where the founder was not found, the questionnaires were responded to by their representatives and as a result this might have introduced some element of biasness in the study findings and thus the representatives of the findings may not represent an accurate picture of the relationship between innovations and performance of micro and small enterprises in Nairobi County.

The study was limited to selected aspects of innovations. Given that the performance of MSEs in Nairobi County could be attributable to other factors that were not covered in this research, then the results of the study wouldn't necessarily be generalizable to the entire population of MSEs in Nairobi County.

The researcher encountered respondents that had difficulty reading and understanding the questionnaire. The researcher guided them by way of reading and explaining using several languages and illustrations necessary to ensure the respondents were able to adequately provide required information. The researcher also encountered respondents

that were not comfortable disclosing information they considered confidential and trade secrets. However the researcher was able to convince a majority that their data would be handled confidentially and the respondents proceeded to disclose more information.

5.6 Suggested Areas of Further Studies

It's recommended that a similar research ought to be carried out but focus on MSEs in a different county for comparison purposes. This would help to establish whether MSEs have similar operational experiences with regard to adoption of technological innovation. However, this is expected to be different due to difference in business environment.

The study also suggested that a similar study be conducted but focusing on SMEs. This would help to establish the differences that exist between MSEs and SMEs with regard to adoption of technological innovation. Though a very thin line exists between the two the study would help to elucidate on how they differ. Further, the study suggest that a more extensive study be conducted to establish the influence of the specific aspects of the different types of technological innovation, this would help the MSEs identify the aspects that have more weight than others and thus have clarity with regard to what to adopt and what not to adopt.

REFERENCES

- Alstrup, L. (2010), Coaching continuous improvement in small enterprises, *Integrated Manufacturing Systems*, 11(3), 165-70.
- Ayyagari, M., Beck, T., & Demircic, A., (2003). *Small and micro enterprises across the globe: a new database*. Banco Mundial, Washington, DC.
- Berger, S. (1998). Capital structure and financing of SMEs: Australian evidence. *Journal of Accounting and Finance*, (43), 123–147.
- Bon, A. T., & Mustafa, E. (2013). Impact of Total Quality Management on Innovation in Service Organizations: Literature Review and New Conceptual Framework. *Procedia Engineering*, 53, 516-529.
- Burns, N. & Burns, S. (2008). *The Practice of Nursing Research: Conduct, Critique and Utilization*: St Louis, Elsevier Saunders
- Carter, F. (2005). *Managing technological innovation: competitive advantage from change*. Hoboken, N.J: Wiley.
- Carton R.B. & Hofer C.W. (2006). *Measuring Organizational Performance: Metrics for Entrepreneurship and Strategic Management*. Edward Elgar Publishing Limited.
- Chang, Tsui, G. & Hsu K., (2013). A Conceptual Model of performance measurement for non-profit organizations, *Management Decision*, 41, (7), 635-642
- Chesbrough, H. (2010). *Open Services Innovation*. London: John Wiley & Sons
- Cooper, R., & Schindler, S. (2008). *Business Research Methods*. New York: Mc Grawhill
- Daft, R.L. (1998). *Organization Theory and Design*, South-Western College Publishing, International Thompson.
- Davenport, T. H. (2013). *Process Innovation: Reengineering Work through Information Technology*. Harvard Business Press
- Davila, T. (2014). *The innovation strategy big companies should pursue*. Harvard Business School Publishing
- Davies, J., Toxall, G. R., & Pallister, J. (2002). Beyond the intention-behavior mythology: An integrated model of recycling. *Marketing Theory*, 2 (1), 29-113.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–339.
- Dishaw, M. T. & Strong, D. M. (1999). Extending the technology acceptance model with task-technology fit constructs, *Information & Management*, 36(1), 9-21.
- Drucker, P. (2001). Innovation and entrepreneurship. Butterworth-Heinemann, Oxford economy, *MIT Sloan Management Review*, spring, 21 (4), 34-59
- Fishbein, M & Ajzen, I. (2010). *Predicting and changing behavior. An introduction to theory and research*. Reading, MA: Addison-Wesley

- Fisher, R.F. (1971). The elastic constants of the human lens, *Journal of Physiology*, 212 (2), 147-180
- Fleischer, M. & Tornatzky, L. G. (1990). *The processes of technological innovation*, Lexington Books: Lexington, M A., 151-175.
- Furst, K., Lang, W. & Nolle, D. (2012). Internet banking, *Journal of Financial Services Research*, 22(2), 95-117.
- Gamal, D., Salah, T. & Elrayyes, N (2011). *How to Measure organization innovativeness? An overview of Innovation measurement frameworks and Innovation Audit / Management tools*
- Gaynor, G.H. (2002). Innovation by design: What it takes to keep your company on the cutting edge. *AMACOM American management association*, New York, NY
- Gerstenfield, A. & Wortzel, L. (2007). Strategies for innovation in developing countries, *Sloan Management Review*, 2(1) 57-68
- Goh, A. (2002). Industrial Policy Focus of South East Asian Nations: Technology Development or Innovation? *Journal for Institutional Innovation, Development and Transition*, 6(1), 89-91.
- Government of Kenya. (2009). *Economic recovery strategy for wealth and employment creation*. Nairobi: Government Printer
- GOK (2016). *Kenyan Government Successful Information Technology Projects*
- Grundiche, R. (2010). *IT audit, control, and security*. Hoboken, N.J: Wiley.
- Gunasekaran, A., Okko, P., Martikainen, T., & Yli-Olli, P. (2012). Improving Productivity and Quality in Small and Medium Enterprises: Cases and Analysis, *International Small Business Journal*, 15(1), 59-72.
- Hafeez, M. H. (2013). *Does Innovation and Relational Learning Influence SME Performance?* Pakistan Study. Canada: Canadian Center of Science and Education.
- Hart, M. (1995). *Business marketing management: B2B*. Cengage Learning.
- Hill & Utterback (2009). *Handbook of innovation indicators and measurement*. Cheltenham: Edward Elgar.
- Iacovou, C.L., Benbasat I. & Dexter A.S. (1995). Electronic Data Interchange and Small Organizations: Adoption and Impact of Technology, *MIS Quarterly*, 3(2), 92-99.
- Kantor, P. (2001). *Innovation and Business Performance*. Chicago: Chicago International Publishers.
- Kash, D. E. & Rycroft, R. W. (2011). *The complexity challenge: Technological innovation for the 21st century*. Cengage Learning EMEA.
- Kemp, R. (2003). *Innovativeness and Firm Performance*. Netherlands: Netherlands Press.
- Kenya National Bureau of Statistics. (2016). *Economic Survey Report*. Nairobi.
- Khan, J. A. (2008). *Research Methodology*. New Delhi. APH Publishing Corporation

- Kiarie, M. (2012). *The Influence of Service Innovation Practices on Customer Satisfaction in the Commercial Banking Sector in Kenya*. University of Nairobi
- Kiraka, R.N., Kobia, M. & Katwalo, A.M. (2013) *Micro, Small and Medium Enterprise Growth and Innovation in Kenya: A Case Study on the Women Enterprise Fund*
- Kihonge, E. (2014). *The Role of Small and Medium Enterprises (SMEs) in Small Towns in Rural-Urban continuum: the case of Sagana and Karatina in Mount Kenya Region, Central Kenya* (Doctoral dissertation, Clermont-Ferrand 2).
- Kiiyuru, D. K. (2014). *Effects of innovation strategies on performance of commercial banks in Kenya*, Doctoral dissertation, University of Nairobi.
- Kiraka, M. K. (2013). *Micro, Small and Medium Enterprise Growth and Innovation in Kenya*. Nairobi: Longhorn publishers.
- Klomp, L., & Van Leeuwen, G. (2011). Linking innovation and firm performance: a new approach. *International Journal of the Economics of Business*, 8(3), 343- 364.
- Koeh, S. (2011). *Procurement Methods and Operational Performance in State Corporations in Kenya*. University of Nairobi
- Kotler, P. (2003). *Marketing Management*, Prentice Hall.
- Lall, S. (1980). Developing Countries as Exporters of Industrial Technology, *Research Policy*, 9, 24-52.
- Lieberman, L. & Montgomery, M. (1998). A dynamic view of strategy, *Sloan Management Review*, 40(3), 55-63
- Lin, C. & Ho, Y. (2007). Technological innovation for China's logistics industry. *Journal of Technology Management & Innovation*, 2 (4), 1-19
- Loof, H., & Heshmati, A. (2013). On the relationship between innovation and performance: A sensitivity analysis. *Economics of Innovation and New Technology*, 15(4-5), 317-344
- Lovelock, Christopher and Lauren Wright. (2002). *Principles of service marketing and management*. New York: Prentice Hall
- Lundblad, E., (2003). Habit Versus Choice: The Process of Decision-Making in Health-Related Behaviour, *Social Science & Medicine*, 55(3), 451-465.
- Lyytinen, K., & Rose, G. M. (2003). The Disruptive Nature of Information Technology Innovations: The Case of Internet Computing in Systems Development Organizations. *MIS Quarterly*, 27(4), 557–596.
- Maalu, J., Khayesi, M. Alila, P. Chitere, P. Kibas, P. Karega, R. Bowen, M. Onfala, J. (1999). *Impact assessment of the WEDCO enterprise development project, research and evaluation (REME) project*, occasional paper N0. 18. Institute for development studies, university of Nairobi.
- Mabrouk, A. & Mamoghli C. (2010). Is financial innovation influenced by financial liberalization? Evidence from the Tunisian banking industry. *Banks Systems Journal*, 5(3).

- Mugenda, O. M.; Mugenda, A. G. (1999). *Research method: Quantitative and Qualitative Approaches*. Acts press, Nairobi, Kenya.
- Mwangi, D.K. (2011). *Effects of Innovation Strategies on Performance of Commercial Banks in Kenya*. University of Nairobi
- Nadler, M. (2006). *A Method of Division in Digital Computers*. John Wiley & Sons Ltd.
- Neely, A. (2002). *Business performance measurement: theory and practice*. Cambridge: Cambridge University Press.
- Nwokah N., Elizabeth I. & Ofoegbu J. (2009). Product development and organizational performance. *Journal of Business Administration*, 2(3), 4-11.
- Ochieng, E. A. (2009). *An investigation on the relationship between Information technology and productivity – a Case study of national oil corporation of Kenya*. Unpublished MBA Project, School of Business, University of Nairobi.
- Odhiambo G. O. (2008). *Innovation Strategies At The Standard Chartered Bank (Kenya) Limited*. Unpublished MBA Project, School of Business, University of Nairobi
- OECD (2002). Performance of SMEs in developing countries. *Policy Brief*, 1-8.
- Oyeyinka, B. (2006). Tokyo: United Nations University Press.
- Palmer, D. & Kaplan, S. (2007). *A framework for strategic innovation*. Prentice Hall
- Polevoi, L. (2013). *How to Measure Your Small Business Performance*. Los Angeles: Vistage International.
- Porter, M.E. (1990). *The Competitive Advantage of Nations*, Free Press, New York, NY,
- Richard, P. J., Devinney, T. M., Yip, G. S., & Johnson, G. (2009). Measuring organizational performance: towards methodological best practice. *Journal of Management* 35(3), 718- 804.
- Robbins, S. P., & Coulter, M. (2009). *Study Guide [to]'Management', [by] Stephen P. Robbins and Mary Coulter*. Prentice Hall
- Roehm, M.L., & Sternthal, B. (2001). The Moderating Effect of Knowledge and Resources on the Persuasive Impact of Analogies", *Journal of Consumer Research*, 28(2), 257-721.
- Rogers, E.M. (2003). *Diffusion of innovations*. New York: Free Press.
- Ruttan, H. (1984). *Innovation and diffusion*. London: Cambridge Publishers.
- Sirmon, D., Hitt, M., & Ireland, R. (2007). Managing firm resources in dynamic environments to create value: looking inside the black box. *Academy of Management Review*, 32(1), 273-292.
- Sun H. & Zhang P. (2006). The role of moderating factors in user technology acceptance, *Journal of Human-Computer Studies*, 64(1), 53-78.
- Swanson, E. B. (1994). Information Systems Innovation among Organizations. *Management Science*, 40(9), 1069–1092

- Tushman, M., & Nadler, D. (2006). Organizing for Innovation. *California Management Review*. Retrieved from <http://www.hbs.edu/faculty/Pages/item.aspx?num=3543>
- Upton, D.M., Kim, B. (1999). Alternative Methods of Learning and Process Improvement in Manufacturing, *Journal of Operations Management*, 16, 1-20.
- Valmohammadi, C. & Servati, A. (2011). Performance measurement system implementation using balanced scorecard and statistical methods. *International Journal of Productivity and Performance Management*, 60(5), 493-511.
- Wagner, H. (2006). Managing the Impact of IT on Firm Success: The Link between the Resource-Based View and the IT Infrastructure Library. *Proceedings of the 39th Annual Hawaii International Conference on Systems Science*, HICSS, 06, 197.
- Wanyama, D.W. & Olweny T. (2013). Effects of Corporate Governance on Financial Performance of Listed Insurance Firms in Kenya. *Public Policy and Administration Research*, 3(4), 96-116
- Worch, H., & Truffer, B. (2012). Absorptive capacity, learning processes and combinative capabilities as determinants of strategic innovation. *European Management Journal*, 30(1), 57 – 73
- Wu, C., & Lin, L. (2009). Guest editorial. *Biotechnology Advances*, 27 (5), 541-561
- Yilmaz, C., Alphan, L. & Ergun, E. (2005). Cultural determinants of customer- and learning-oriented value systems and their joint effects on firm performance. *Journal of Business Research*; 58 (10): 1340-52.

APPENDICES

Appendix I: Questionnaire

This questionnaire has been designed to collect information on the effect of technological innovation on enterprise performance of MSEs in Nairobi County, Kenya. Please read carefully and answer the questions as honestly as possible. The information gathered will be used purely for the purpose of academic research and will be treated with utmost confidence.

Instructions

1. Tick appropriately in the box or fill in the space provided.
2. Feel free to give further relevant information to the research.

Part 1: Background Information

1. Information on Owner/manager/supervisor
 - a. Level of education: Below high school () High school ()
Diploma () Graduate () Post-graduate ()
2. Information on Business
 - a. Type: Manufacturing () Service () General trade ()
 - b. Years of operation
 - c. Number of employees
 - d. Number of branches

Part 2: Innovation

Please estimate to what extent the following statements relate to the various types of innovations in your MSE.

PRODUCT/SERVICE INNOVATION

Please tick one choice for each of the following statements. (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree).

Indicator	1	2	3	4	5
In new product and service introduction, our company is often first-to-market					
New products and services are often perceived the best by customers					
New products and services in our company often take us up against new competitors					
In comparison with competitors, our company has introduced more innovative products and services during past 3 years					
We manage to cope with market demands and develop new products quickly					
We continuously improve old products and raise quality of new products					

PROCESS INNOVATION

Please tick one choice for each of the following statements. (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree).

Component	1	2	3	4	5
Development of new channels for products and services offered by our corporation is an on-going process					
New business methods and services are always worth if they improve productions (new machinery, new process among others)					
The firm rewards employees in terms of their productivity					
The firm conducts internal training of its employees upon introduction of new machinery, processes.					
Employees attend seminars, workshops, conferences with intention to acquire or improve their skills.					

MARKET INNOVATION

Please tick one choice for each of the following statements. (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 =agree, 5 = strongly agree).

Component	1	2	3	4	5
In marketing innovations (entering new markets, new pricing methods, new distribution methods, etc.) our company is better than competitors.					
We deal with customers' suggestions or complaints urgently and with utmost care.					
Introduction of new marketing approaches (online marketing, ebusiness etc)					

Our firm manages to deliver special products flexibly according to customers' orders					
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INFORMATION TECHNOLOGY INNOVATION

Please tick one choice for each of the following statements. (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree).

Component	1	2	3	4	5
Organization makes use of radio frequency identification systems (RFID)					
The organization has automated storage and retrieval system					
The organization makes use of global positioning systems					
Electronic data interchange is widely practiced in the organization					

Part 3: Firm Performance

- a) In your own opinion how would you rate the organization performance indicators below before and after implementing some technological innovation practices in the firm?

Performance Indicator	Greatly improved	Improved	Constant	Reduced	Greatly reduced
	1	2	3	4	5
Cost reduction					
Productivity					
Flexibility					
Profitability					
Market share					
Asset efficiency utilization					

Thank you for your co-operation