

**EFFECT OF TECHNOLOGY INNOVATION ON ACCESS TO MARKETS BY
SMALL MEDIUM ENTERPRISES IN NAIROBI COUNTY**

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DECLARATION

This project is my original work and has not been presented for any degree or examination in any other university.

Signed

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D66/88590/2016

This project has been submitted for examination with my approval as the university supervisor

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DEDICATION

This project is dedicated to my family, my daughter Amira, my sister Beth, my brother Wilfred and my mother Lucy. You have given me great motivation throughout this research project and I will forever be indebted to you. I pay gratitude to my supervisor for his guidance and untenable wisdom throughout this course.

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TABLE OF CONTENTS

DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGEMENTS	iv
LIST OF FIGURES	viii
LIST OF TABLES	ix
ABBREVIATIONS AND ACRONYMS	x
ABSTRACT	xi
CHAPTER ONE: INTRODUCTION	1
1.1.1 Concept of Innovation	2
1.1.2 Technology Innovation	3
1.1.3 Access to Markets.....	4
1.1.4 Small and Medium Enterprises in Nairobi County	5
1.2 Research problem.....	5
1.3 Objective of the study	7
1.4 Value of Study.....	7
CHAPTER TWO: LITERATURE REVIEW	9
2.1 Introduction	9
2.2 Theoretical Foundations	9
2.2.1 Diffusion of Innovation (DOI) Theory	9
2.2.2 Market Orientation Theory	10
2.2.3 Resource Based Theory	11
2.3 Technological Innovation.....	12
2.3.1 Product Innovation	13
2.3.2 Process Innovation.....	15

2.4 Innovation and SME market access	15
2.5 Summary of Literature and Knowledge Gaps.....	16
CHAPTER THREE: RESEARCH METHODOLOGY	18
3.1 Introduction	18
3.2 Research Design.....	18
3.3 Population under study.....	19
3.4 Sample and sampling procedures.....	19
3.5 Data Collection.....	20
3.5.1 Data Validity and Reliability.....	20
3.6 Data Analysis	21
3.6.1 Analytical Model	21
CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSSIONS.....	23
4.1. Introduction	23
4.2. Questionnaire Return Rate	23
4.3. Demographic Characteristics of the Respondents.....	24
4.3.1. Gender of the Respondents.....	24
4.3.2. Age of the Respondents.....	25
4.3.3. Highest Level of Education	26
4.3.4. Business Entity Engaged In.....	27
4.3.5. Age of the Business	28
4.4. Extent of Innovation.....	29
4.5. Factors Influencing Diffusion of Innovation.....	30
4.6. Relationship between Innovation and Market Access	31
4.7. Inferential Statistics.....	32
4.7.1. Model Summary	33

4.7.2. ANOVA Results	34
4.7.3. Coefficient of Determination.....	35
4.8. Discussion of Findings	37
CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS	38
5.1. Introduction	38
5.2. Summary of the Findings	38
5.3. Conclusion.....	39
5.4. Recommendations of the Study.....	39
5.6. Suggestions for Further Research	41
REFERENCES	42
APPENDICES	47
Appendix 1- Letter of introduction	47
Appendix 1I- Questionnaire	48

LIST OF FIGURES

Figure 4.1. Gender of Respondents.....	24
Figure 4.1. Highest Level of Education	26
Figure 4.2. Business Entity Engaged In.....	27
Figure 4.3. Age of the Business	28

LIST OF TABLES

Table 4.1. Response Rate	23
Table 4.2. Distribution of Respondents by Age	25
Table 4.3. Extent of Innovation.....	29
Table 4.4. Factors Influencing Diffusion of Innovation.....	30
Table 4.5. Relationship between Innovation and Market Access	31
Table 4.6. Model Summary	33
Table 4.7. ANOVA of the Regression	34
Table 4.8. Coefficient of Determination	35

ABBREVIATIONS AND ACRONYMS

SMEs - Small and Medium Enterprises

SMMEs - Small Micro and Medium Enterprises

KIPPRA - Kenya Institute of Public Policy Research and Analysis

GOK - Government of Kenya

ICT - Information, Communication and Technology

KNBS - Kenya National Bureau of Statistics

GDP - Gross Domestic Product

DOI - Diffusion of Innovation

RBT - Research Based Theory

NCC - Nairobi City Council

SPSS - Statistical Package of the Social Sciences

ABSTRACT

Innovation has become one of the major contributors to the survival of any business. This means that businesses should constantly develop and improve their products and services as well as all the processes that are involved from the production stage to the consumption stage. This study was aimed at determining the effect of technology innovation on access to markets by SMEs in Nairobi County. The objective of the study was to investigate the effect of technology innovation in entry to markets by SMEs in Nairobi County, Kenya. Descriptive research design was used for this study. Inferential statistics, measures of central tendencies and distribution were applied. The target population for the study was 1050 SMEs, registered in Nairobi County. Stratified random sampling was employed, with a target of 210 registered SMEs within Nairobi County. The number represented 20% of the total number of registered SMEs within Nairobi County which is 1050. Primary data was collected by use of self-administered questionnaires was from the SMEs owners in Nairobi County. Data analysis was done using SPSS and findings presented using percentages, tables and charts. The researcher, in this study, aimed at establishing the effects of technological innovations on the on access to markets by SMEs in Nairobi County, Kenya. The study established that on the extent of SME innovation there is continuous improvement in processes to create value to the customer. The study further established that size of the firm was the factor that mostly influenced diffusion of innovation. The study also established that value of product innovation contributes the most to the access to markets by small medium enterprises, followed by value of service innovations. The value of product innovation, value of service innovations, and value of new production processes were all significant at a five per cent level of significance and a 95% level of confidence of on access to markets by SMEs. The study concluded that enhanced and innovative customer relations have increased understanding on markets among SMEs. The study further concluded that value of product innovation contributes the most to the access to markets by small medium enterprises, followed by value of service innovations. This study recommends that small and medium enterprises should develop effective innovation policies on marketing since marketing is one of the major determinants of SMEs performance.

CHAPTER ONE: INTRODUCTION

This chapter provide the background of the study. It also outlines the research problem and forms a foundation for identification of the research gap. Additionally, it stipulates the objective of the study and shows the value in theory, practice and policy.

1.1 Background of study

Small and Medium Enterprises abbreviated as SMEs are viewed as great contributors to economic development in Kenya. This segment of businesses creates trade openings and steers business rivalry and economic development (KIPPRA, 2002). SMEs consists of around 75 % of businesses, contributing to 18.4 % of GDP, are owned by 4.6 million individuals (30%) and represent 87% of employers in Kenya (GOK, 2009). SMEs are considered a focal point of modern economic progression making the government of Kenya to pivot a few improvement methods in their favour (Alavi & Leidner, 2007).

SMEs face impediments that make it problematic to achieve maximum capacity and realize the administration needs. These challenges are and not limited to constrained markets, restricted access to data, challenges in accounts and innovation and difficulty in laying out procedures for administration among others (Kotsemir & Abroskin, 2013).The study was underpinned by theories that have been used to explain technological innovation on the market access by SMEs in Nairobi County. These theories include, diffusion of innovation theory which is used to explain reasons for firms adopting new technologies.

Finally, the resource-based theory has been used as a management tool in identifying firms' strategic resources. Resource based theory is based on the perspective of a firm as a collection of capabilities. ICT is distinguished as an empowering influence in businesses, (GOK, 2007) opening doors for SMEs to enhance their entry into new markets. ICT is an imperative instrument in the profoundly globalized information economy. Information Communication and Technology has both tangible and intangible benefits to SMEs. It can be used by SMEs in accessing markets by encouraging communication with clients, create information access by obtaining and creation of value items, study different market situations age and also decrease of organization costs. Besides that, ICT can majorly contribute and affect the performance and culture of an organisation.

1.1.1 Concept of Innovation

Innovation is the process through which a development or thought is converted into an improved product, Process or an absolutely new product or service (Kantor, 2001). It additionally clarifies that innovation ought to have the capacity to fulfil a specific requirement. Innovation as a term touches on new products in addition to new processes in a business as well as development of improved procedures. Schumpeter (1934) describes various types of innovation such as new items, business techniques, supply avenues, new markets, and better approaches to doing business. As indicated by Abouzeedan (2011), innovation is something new that lessens costs or brings enhanced benefits that better fulfils markets' demands. Innovation can develop because of technological changes, reaction to market changes and also product changes.

Innovation contributes to the competitiveness of an organisation. Shukla (2017) defines innovation as a catalyst for development since it helps in wealth creation through increased business. Innovation brings in new ideas and concepts and gives businesses a competitive advantage. In SMEs, the entrepreneur acts as the innovator for the business directly or through his innovation team. An innovator should possess characteristics such as willingness to take risks, explore the unknown and a desire to create. According to Tredgold (2018), innovation was critical for any firm's long term success, by providing companies with a competitive advantage.

1.1.2 Technology Innovation

Technology innovation is a portion of the collective innovation discipline. It centres mainly on technology and how to encapsulate its efficiently in products, managements and processes. Technological innovations are the activities that harness development and design of new products, services and techniques involved in improving and redesigning existing products. Technological innovation has been cited in various studies as a critical factor in SMEs market accessibility both in developed and developing nations. It is an inevitable requirement for enterprises which seek to develop and retain an upper edge in terms of competition as they access new markets (Decheikh et al, 2006).

Technological innovation has transformed the manner of carrying out. The accessibility to markets and other resources as a result of enhanced connectivity assists firms in growth and creation of jobs as well as attracting opportunities in competitive new markets. Technology innovation contributes to the efficiency in the production process of products or services in a business.

1.1.3 Access to Markets

Market access is connected with the formation of novel and helpful ideas through innovation and resourcefulness. In a few developing markets, including low-salary economies, market access is usually likely to receive, adjust, and scale advancements and technology made elsewhere. In a study by Oke, et al. (2007) on product innovation, firms that were constantly improving their products found it easier to penetrate the markets.

Thus, enterprises in these nations are utilizing technology to enter markets and improve their products and administration contributions to new and unexploited markets, a procedure that produces new clients, purchasers, dealers, and representatives. This changes the quest for benefits into a driver of monetary development, and higher profitability and expectations for everyday comforts, and gives technology a focal point in developing business sector advancement.

Adjustment or appropriation of new advancements from different nations enables organizations in developing markets to expand their profitability, better serve client needs, reach beforehand underserved and new clients, and be more aggressive in reaching out bigger markets. As a result, adopting innovation can drive costs down significantly and enable rare resources to be assigned to more profitable sectors of a business. The degree of such depends not just on the speed of technology presentation but also by the means of innovation (Timmons 2015).

1.1.4 Small and Medium Enterprises in Nairobi County

It is estimated that in Kenya there are over 7.5million SMEs that create income generating and employment opportunities in the low-income localities, KNBS (2016). This segment has contributed to country's GDP with an increase from 13.8 % to 40 % from 1993 to 2008. SMEs contribute 14 % of the country's GDP (Mullei & Bokea, 2009). SMEs in Kenya are becoming major economic and national contributor through job creations that translate to income and improved livelihood for Kenyans.

Only a few SMEs in Kenya grow into firms whose contribution is accredited to the economy as over 60% of small businesses are estimated to fail each year (Kenya Bureau of Statistics, 2015). There are approximately 157,846 registered SMEs in Nairobi County. The SMEs business categories consists of general trade wholesale and retail stores, transport, communication, food stores, expert and wellbeing and last but not least industrial factories and workshops (Bowen et al., 2009).

1.2 Research problem

All businesses are currently faced with unpredictable competition. According to Poorangi, et al (2013) all businesses that are not constantly innovating are faced with intense rivalry challenges. SMEs are turning to innovation in order to stay afloat. According to Farsi and Toghraee (2014), there are implications that come about from failing to innovate which result to collapse of economies and reduced competitiveness. Senge and Carstedt (2011) assert that innovation is a basic method used by a company so as to attain growth that can be sustained and address the main challenges faced by SMEs in the competitive environment today.

Based on McEvily et al. (2014) study on the role of innovation in businesses, he argued out that innovation was important in driving competitiveness, more profits and greater productivity to unlock the potential of many SMEs, Markets keep changing every now and again; hence SMEs have to adopt innovative ways of carrying out their businesses to maintain their sustainability and continued existence. This change is due to varied consumer behaviours, needs and preferences, globalization and the entry into the market of new businesses all of which result to new or transformed goods and services.

SMEs have made an immense economic contribution through the provision of opportunities of income generation and employment opportunities. SMEs have both unique features and styles of operations. Majority of the SMEs are family owned thus the responsibility of making decisions as regards to adoption of innovations remains to be subjective. The adoption of innovations is pegged on the manner in which the managers will adopt innovations in their firms.

Scholars have studied different aspects of innovations and firm performance and access to markets. According to Bozic and Sonja (2005), SMEs that adopted innovations had better performance in terms of profitability. This study looks at the aspect of innovation and market access. Karanja et al (2013) studied innovation's impact on growth of SMEs in Jericho, Nairobi County. This study established that the adoption of innovations contributed to the growth of the firms in Jericho but did not address its effect on access to markets.

Other past studies carried out involved, Gakure et al (2013) who studied the importance of innovation in ascertaining the competitive edge of electronic manufacturing businesses in Kenya, while Ngirigacha & Bwisa (2013) studied the contribution of entrepreneurial innovations on the competitiveness of SMEs in Thika county. These past studies have majorly centred on the association between technological innovation and competitiveness as well as performance of bigger firms whilst giving little consideration to access to markets.

This study aims at evaluating the effect of technological innovation in access to markets by SMEs in Nairobi County, Kenya. The researcher seeks to establish if and how technology innovation contributes to market access by SMEs in Nairobi County. It, the study, will aim to address the research gap by providing answers to the question; what is the effect of technological innovations on the market access by SMEs in Nairobi County, Kenya?

1.3 Objective of the study

The research objective for this study was to ascertain the effect of technology innovation on access to markets by SMEs in Nairobi County, Kenya.

1.4 Value of Study

By providing a critical analysis of various technological innovations towards SMEs, this study is expected to act as wakeup call for the government, larger business enterprises as well as SMEs in applying technological innovations to access larger markets for their products and services. The government of Kenya and Nairobi County government can utilize the findings from the study to aid in the advancement of structures towards development and market access of SMEs ventures in Kenya.

Policy makers will utilize the information and information to change or reinforce the situation in strategy definition. The findings of the study could also be used by the ministry of education in designing the Kenya school curriculum. Through this study SMEs owners may benefit through findings to realise the portfolio of choices of innovation developments that they can adopt to enable them have market access. Such innovations may bring sustainability and competitive advantage to SMEs through new product and process development as well as access to new markets. The study helps SMEs in a more reliable future plan and projections for their business.

The study contributes to theory by bringing awareness and understanding of the role of technology innovation on market access which may also contribute to the knowledge base for other researchers. The results from the study may decrease the overall uncertainty in market growth. Findings from this study may help academicians in increasing their knowledge in regards to use of technology in business growth while subsequently giving a more profound comprehension of technology development in access to markets.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

In this chapter an outline on particular theories of innovations and empirical review of literary works that will form the basis of this study. Discussions will link technological innovation to market access by SMEs in Nairobi. The chapter will provide an overview on the various studies undertaken and their results.

2.2 Theoretical Foundations

This section explores theories and their effect of technology innovation as a means of accessing markets by entrepreneurs. The theories advanced include; diffusion of innovation theory. DOI delves into how innovation is channelled through the various organs and departments of a business. The needs and desires of customers are well demonstrated through the market orientation theory. Organisation resources and how their management affect businesses are demonstrated through the resource-based theory.

2.2.1 Diffusion of Innovation (DOI) Theory

The DOI theory has been used to provide reasons for technology adoption. Rogers (1995) depicts diffusion to be “the process through which innovation are made known via specific avenues amongst individuals of in a societal setting over time” (Rogers, 1995). The Diffusion of Innovation Theory (DOI) primarily focuses on the relative advantages or disadvantages of innovation adoption; thus DOI factors such as innovativeness, complexity, compatibility and relative advantage assist in forming a framework.

DOI approach is critical in this study in that it provides the dynamic forces in action, in relation to adopting and use of innovations in SMEs. The firm's decision to adopt innovations is often interwoven with the owners' individual perspectives and attitudes to technology adoption. Diffusion in SMEs is essentially through interpersonal/inter-firm networks or through organisations transfer channels of innovation.

The diffusion theory is of relevance since it provides an explanation as to why SMEs embrace technological innovations. Chief among this is the relevant advantage they enjoy compared to their competitors. Therefore, SMEs that adopt technological innovations have comparatively superior market access as opposed to those that don't.

2.2.2 Market Orientation Theory

Market orientation by Berkowitz's (1989) emerged from the theory of marketing. Market orientation philosophy is focused on ascertaining and fulfilling the needs and desires of its clients through its product combination. According to Berkowitz's (2000) market orientation focuses on tailoring the products in meeting the clients' needs as opposed to establishment of selling points for existing goods and services. Market introduction hypothesis expresses that the way to acknowledging authoritative objectives lies in the coordination of advertising exercises and in deciding the requirements of target markets (Kotler, 1999).

Firms which have a clear focus for clients, players and the business atmosphere have a competitive advantage. Firms should therefore endeavour to know their customer needs, after which translate that into products. For this to be achieved, initiatives require marketplace information for the effective marketing of their products.

Statistical surveying and buyer analysis are basic in empowering firms to meet their client needs keeping in mind the end goal is to stay competitive. An immediate relationship exists between market introduction and firm execution (KIPPRA, 2006). Vorhies & Harker (2000) found that organizations with high market introduction additionally had larger amounts of the six advertising capacities comprising of showcasing research, product improvement, evaluation, conveyance, and advancement and promoting administration. (Wilden & Gudergan, 2015) found that showcasing abilities are emphatically connected with firm execution in profoundly aggressive conditions.

Market orientation theory also seeks to address why some businesses are more market oriented than others. It further seeks to find out what are the effects of market orientation on employees and the business in general. Market orientation additionally seeks to establish well, the effect of linkage between market orientation and the environment and its effect on business performance (Kohli & Jaworski, 1990).

2.2.3 Resource Based Theory

The RBT theory is defined as a management tool that is used in knowing a firm's strategic resources. The key focus of this theory is that the firm's competitive advantage is encompassed in its utilization of a collection of important resources at its disposal. For a short-term competitive edge to transition to long-term, the resources must possess a heterogenic nature.

Resource-based theory investigates the inceptions of upper hand and predominant execution (Barney et al., 2011), and "immaterial resources are of its central concern. It focuses on inspecting the variables that record for execution variety" (Galbreath and Galvin, 2006). RBT seeks to address issues concerning firm's resources.

RBT clarifies the execution contrasts among firms in connection to inside or firm-level variables (Wernerfelt, 1984). It further looks into the impacts of innovation as a firm-particular resource on firm execution. For Schumpeter (1934), firm achievement isn't really connected with marketplace influence, rather the after effect of innovation and new advancements.

2.3 Technological Innovation

Several works have been carried out which have all indicated that there is a strong association between growth of SMEs and technological innovations in various industries. Coad and Rao (2008) conducted a study on the association between innovation and the growth of sales for firms which dealt with high technology. In the event that innovation is successfully adopted, the segment of new product innovations will grow total sales revenue and in this case, firms will experience growth in their sales volume and investments which will consequently translate to growth in size of the firm.

Technological innovation is a fundamental element in regard to the creating a competitive edge of a firm and its access into new markets (Becheikh et al. 2006). SMEs have been shown to exhibit more flexibility in developing and implementation of new ideas. The SMEs' flexibility and receptiveness are the important features that have facilitated their innovation (Harrison & Watson 1998). Technological innovation has fundamentally been key contributor to organisations growth and development.

Chaminade and Vang (2006) stipulate that SMEs across various industries have untapped innovation potential. Some researchers have noted that the increase in profitability of firms is attributed to changes in technology (Ruttan, 1997). Hughes (1997) stated that the SMEs that experienced growth in many cases had embraced product or process innovation. Various studies have been carried out that indicate that SMEs which adopted innovations in their daily operations showed marked improvement in their performance.

Innovation is mainly considered at service, process or product level, whereby product innovation meets the needs of customers while process innovation enhances the effectiveness of the operations in an organization (Christensen, 2007). In conclusion, SMEs innovation practices enhance the development of a firm's competitiveness and profitability in that firms that are market focused have a superior innovation capacity, and will be more successful in response to environmental concerns resulting to a competitive edge (Gima, 1996; Adu, 1998).

2.3.1 Product Innovation

Schumpeter (1934) describes product innovation as the creation of a new or improved product; one in which the purchasers are not yet acquainted with. Product innovation significantly impacts organizations directly in today's business environment. It is therefore, the presentation of new capacities, improved execution or the expansion of new highlights into the current products (Susman et al, 2006). SMEs face unwavering pressure from clients to bring down costs and improve on products. Susman emphasises that organizations must offer clients new products in order to remain competitive.

Nooteboom (1994) additionally advises SMEs to seek product innovation techniques in developing markets. Trott (1998) affirms that enterprises must have the capacity to adjust and advance their products for a chance to survive in the market. The capacity to change and adjust along these lines is extremely vital to the survival of any business. Product innovation should be constant in any business in order to keep customers satisfied through meeting their needs.

New products substitute existing products in an organization's product line (Choi, 2005). The new product quickly takes over from existing products due to their superior characteristics as compared to existing products. Innovation advancement frames its premise on directing client overviews and endeavouring to recognize specific client requirements for products, which are to a great extent non-existent (Sundbo, 2003).

The thought behind product advancement includes the possibility of gradually growing new products. In a perfect world, such products ought to be created based on clients' needs and appear as a procedure of cooperation between the advertising office and information of the market obtained from the feedback it acquires from the clients. Customers' needs and preferences can only be achieved by constantly examining the trends in the market and constantly improving the existing products. In summary, product innovation is the ads-on on existing products or entirely creation of new products.

2.3.2 Process Innovation

This innovation is depicted as the realization of unique and improved techniques in delivery or production methods; an organized thought that incorporates changes in the general procedure, which is away to decrease the costs, lead-time and wastes or improve creation viability. Process development has a prompt and brisk impact on the efficiency execution by SMEs (Castillejo, 2008) to significantly improve on their production processes.

SMEs might have the capacity to actualize process innovation quicker and at lower costs when compared with bigger firms (Buckley & Mirza, 1997). Process effectiveness fundamentally helps move production from low efficiency (low in regards to manufacturing) to high profitability in regards to income as a result of superior products from efficient processes. Innovation attempts to enhance numerous extensive and small parts of product aspects through quality production processes.

2.4 Innovation and SME market access

Marketing is a critical element for SMEs and it is made possible through market growth. Market access in developing countries is the fundamental test to SMEs because of market flaws that can be credited to unavailability of market data, absence of links between performing specialists in the generation system, twists or lack of information and yield markets, high trade cost and high proximity of trade centre individuals. Potential favourable circumstances of growth to SMEs include increased profitability, diminishing costs and growing the market.

Innovation can essentially affect the market knowledge of products and their existence (Ritchie & Bridley, 2005). Market innovation incorporate sites which show the merchandise, administrations and information of a firm on the internet. It can likewise coordinate the internet business usefulness, for example, offering the capacity to place orders as well as pay for them.

In Kenya like other nations in Sub-Saharan Africa, the capacity of SMEs to grow to a great extent relies upon its innovation abilities and its information accessibility. In a study that looked to build up and record diverse kinds of innovations embraced by a garment SMEs in Nairobi (Walobwa et al., 2013), the researcher found out that there was a direct relationship between innovation applied and number of new businesses generated.

2.5 Summary of Literature and Knowledge Gaps

This section looks into the literature and the various knowledge gaps in this study. Schumpeter (1935) argued that a business without innovation and entrepreneurship cannot stand the test of time. This concept has been proven by numerous studies that have shown a progressive relationship between innovation and the performance of SMEs.

Several scholars have noted this, and have come with varied conclusions on this relationship. The survival of the business is also dependent on how innovative the business is (Polevoi, 2003). He found out the businesses that come up with new products are able to weather the storm of change in the customer tastes and preferences. This helps in the performance and the growth of the business and makes it survive in the long haul. However these studies did not highlight the effects of technology innovation on market access hence this study seeks to fill the gap.

Innovation and learning are strongly related to the performance of SMEs. Kiraka, (2013) did a study on “Innovation and SMMEs in Kenya”, concluding that growth was more significant in those SMEs that embraced innovation. It was however noted that not all innovative activities were successful, some faced rejection from the markets where consumers were afraid to try new products and stuck to what they already believed in as a result convincing them to purchase the improved product or service was a serious challenge.

Based on the audit of significant literature, it is clear that exploration in the territory of innovation has been done yet not extensively. Majority of the literature looks at implementing innovation in designing new products and services and the impact of innovation in developed countries. There are only few studies conducted on innovation and market access that are specific to how Kenya as a developing Country promotes innovations in SMEs. There is need, therefore, to carry out a study on how innovation affects market access of the SMEs. This study as a result seeks to find out the extent of SMEs engagement in Innovation in Nairobi County and also the effects it has on access to markets.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter provides the procedures and methods, which were used in meeting the study objectives. They include: the target population, research design, data collection methods and data analysis. The method is totally representative of the area of study. Use of statistical and analytical tools was employed to evaluate the effects of technology innovation on entry to markets by SMEs in Nairobi County.

3.2 Research Design

A research design is a portfolio of procedures used in data collection and analysis of variables. The variables address the research problem. A research design therefore integrates various components in a study in a logical way that addresses the research problem. The study took the form of a descriptive research design.

Cozby (2005) described a descriptive design as that which is utilized to gather information that highlights characteristics of the target population. Descriptive research design involves getting some information through observations, dispositions, conduct or qualities. This methodology was adequate for this study because the researcher expected to gather information through illustrations making it helpful to distinguish factors under the investigation.

3.3 Population under study

Population is described as a gathering of individual people, items or articles from which tests are run for estimations; it is through this that the researcher made inductions from (Babbie, 2005). The study target population was 1050 SMEs, registered in Nairobi County. Nairobi Central Business District was picked due to high concentration of SMEs.

Nairobi being the country's capital city attracts different types of SMEs due to a high number of city residents. The population of SMEs was drawn from an SME list obtained from Nairobi City county government. The SMEs were grouped as per the kind of service or product provided as indicated in Nairobi City Council list.

3.4 Sample and sampling procedures

Sampling alludes to a strategy utilized in drawing tests from a population for the most part to the point that the example encourages assurance of some theory concerning the population (Chandran, 2004). A stratified sampling system was utilized to guarantee that the data collected is fully representative of the entire population. This was achieved through developing of stratas that were fully representative of the county SMEs.

The study employ stratified random sampling, with a target of 210 registered SMEs within Nairobi County. This represents 20% of the total number of registered SMEs within Nairobi County, which is 1050 SMEs (NCC, 2013). Mugenda & Mugenda (2003) maintains that if well chosen, 10% to 30% sample sizes from a population often give credible reliability.

3.5 Data Collection

Questionnaires were the fundamental instrument for data collection. Data was gathered from the proprietors of the SMEs in Nairobi County through the questionnaires administered. As indicated by Chandran (2004), questionnaires are helpful in a descriptive report to adequately get data from respondents in a non-intrusive way.

The questionnaire utilized was isolated into three segments with the first segment; segment A was intended to get the general information about the SME including the territory of task, age, size and productivity patterns. Segment B was supposed to accumulate information on the effect of innovation within the firm whereas section C, to get data on the impact of innovations on access to markets.

3.5.1 Data Validity and Reliability

Validity and reliability was undertaken through a pilot test. Validity is the magnitude to which data collected is efficient and conclusive to be used in this study. Reliability is to the magnitude to which findings can be duplicated by other researchers (Saunders, 2009).

So as to test the consistency of data recorded, the Cronbach's alpha coefficient was utilized to rate the reliability of the instrument; the questionnaire. 0.7 was used as the coefficient. This strategy randomly parts the data set into two and a score for every member computed from every 50% of the scale. The preferred standpoint with utilizing Cronbach's alpha is that the data is part into each conceivable way and the connection coefficient for each split figured.

3.6 Data Analysis

Data analysis brings structure and importance to the bulk of data gathered. It includes looking at what has been gathered and making conclusions and derivations Kombo & Tromp (2006). Data collected was analysed using inferential statistics and descriptive statistics in form of percentages and frequencies.

Data analysis was done using SPSS. Tables and diagrams and other focal propensities were used to present findings. The researcher sought to make out the effects of technological innovations on the access to markets by SMEs in Nairobi County, Kenya.

3.6.1 Analytical Model

The multiple linear regression analytical models were used in analysing the independent variables that represent types of innovations and dependent variable that represent market access. The analytical model, as below, was therefore used in used in determining the relationship between the dependent and independent variables:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Where:

Y- Is the SMEs access to markets as a dependent variable

β_1 – is the co-efficient of product innovations

β_2 – is the co-efficient of service innovations

β_3 – is the coefficient of new production processes innovations

X1 – value of product innovation

X2 – value of service innovations

X3 - value of new production processes

ε = error or random term

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSSIONS

4.1. Introduction

Data that was collected on effect of technology innovation on access to markets by small medium enterprises in Nairobi County is presented in this chapter. The sample of 210 respondents was used to which questionnaires were administered. The chapter introduces information with regard to respondents and then looks into the relationship between innovation and market access, factors influencing diffusion of innovation.

4.2. Questionnaire Return Rate

In this section, the questionnaire return rate sought to ascertain if the number of return rate was sufficient for the study. At least 50% return rate is recommended. This part analyses information on the questionnaires that were returned from the field. Findings on filled in questionnaires and unreturned questionnaires are presented in Table 4.1.

Table 4.1. Response Rate

Response	Frequency	Percentage
Responded	190	90.4
Not responded	20	9.6
Response rate	210	100

Source: Research Data (2018)

Out of the sampled population, as in Table 4.1, 190 duly filled questionnaires were returned thus making a response rate of 90.4%. However, 20 questionnaires were not returned representing a 9.6% non-return rate. The response rate was representative and was adequately used to answer the research questions.

4.3. Demographic Characteristics of the Respondents

The respondents' details were age, gender, top most level of education, business entity engaged in, and age of the business. Age was relevant in determining which age bracket was prevalent in the use of technology innovation in their businesses. The level of education was fundamental in determining uptake of technology innovation in businesses growth.

4.3.1. Gender of the Respondents

This section sought to establish the existence of any gender disparities with regard to technology innovation uptake. The findings may be relevant in addressing the gender gap. The respondents were requested to indicate their gender. Accordingly, the findings are as presented in the figure 4.1.

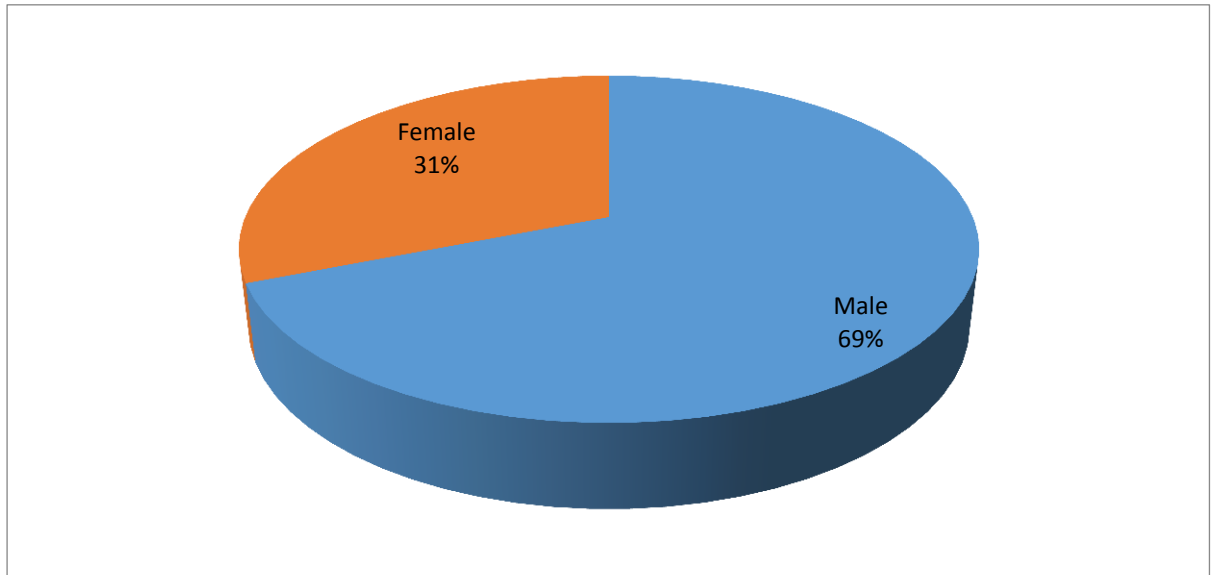


Figure 4.1. Gender of the Respondents

Source: Research Data (2018)

The findings on Figure 4.1 show that majority (69%) of the respondents were male and 31% of the respondents were female. This implies that even though most of the responses emanated from males there was gender imbalance. The gender information was significant for the study in that it helped in identifying the gender which was involved in technological innovation among the SMEs

4.3.2. Age of the Respondents

The study aimed to find out what the actual age of the respondents was. Age was particularly relevant in determining which age bracket was more tech savvy with regard to their business. The findings are as indicated in Table 4.2

Table 4.2. Distribution of Respondents by Age

Age Bracket (%)	Frequency	Percentage
20 – 30 years	56	29.5
30 – 40 years	75	39.4
40 years and above	59	31.1
Total	190	100

Source: Research Data (2018)

As in Table 4.2, the findings show that most (39.4%) of the respondents ranged between 30 and 40 years of age. Further, 31.1% indicated they were above 40 years, while 29.5% indicated they were aged between 20-30 years. This depicts that most of the respondents were aged and thus could offer reliable information concerning the subject of the study.

4.3.3. Highest Level of Education

The respondents were requested to give information on their education level. The level of education was fundamental in establishing if indeed there existed a relationship between the education level and use of technology innovation. The findings are as shown in figure 4.2

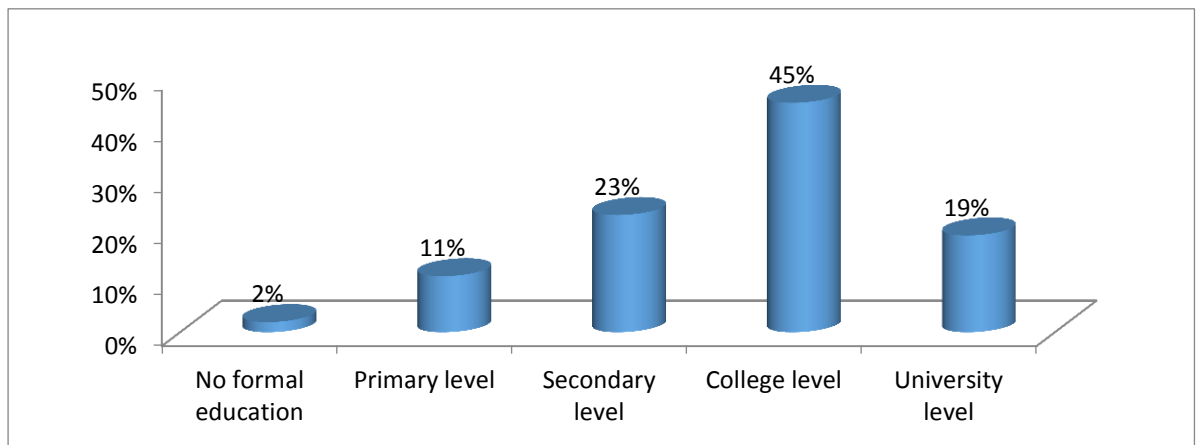


Figure 4.2. Highest Level of Education

Source: Research Data (2018)

It was found, as in figure 4.2, that most (45%) of the respondents had college level of education. In addition, 23% indicated secondary level, 19% indicated university level, 11% indicated primary level, while 2% indicated they had no formal education. This depicts that most of the respondents had adequate education to be able to answer questions related to the subject of the study.

4.3.4. Business Entity Engaged In

The respondents were asked to state the business entity they are engaged in. This was essentially vital in establishing businesses that engaged in technology innovation in comparison to others. The findings are shown in figure 4.3.

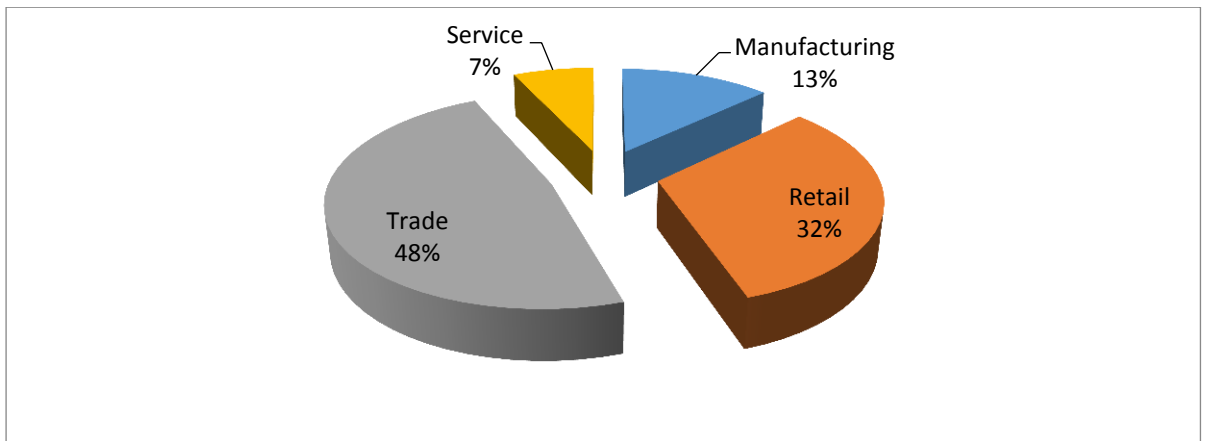


Figure 4.3. Business Entity Engaged In

Source: Research Data (2018)

As in figure 4.3 the findings show that most (48%) of the respondents indicated that were engaged in an SMEs that deals with trade. In addition, 32% indicated retail, 13% indicated manufacturing, while 7% indicated service. This depicts that most of the respondents indicated that were engaged in an SMEs that deals with trade.

4.3.5. Age of the Business

The respondents were required to indicate the age of the business. This was instrumental in determining the number of years that SMEs under study had been in operation. The findings are shown in figure 4.4.

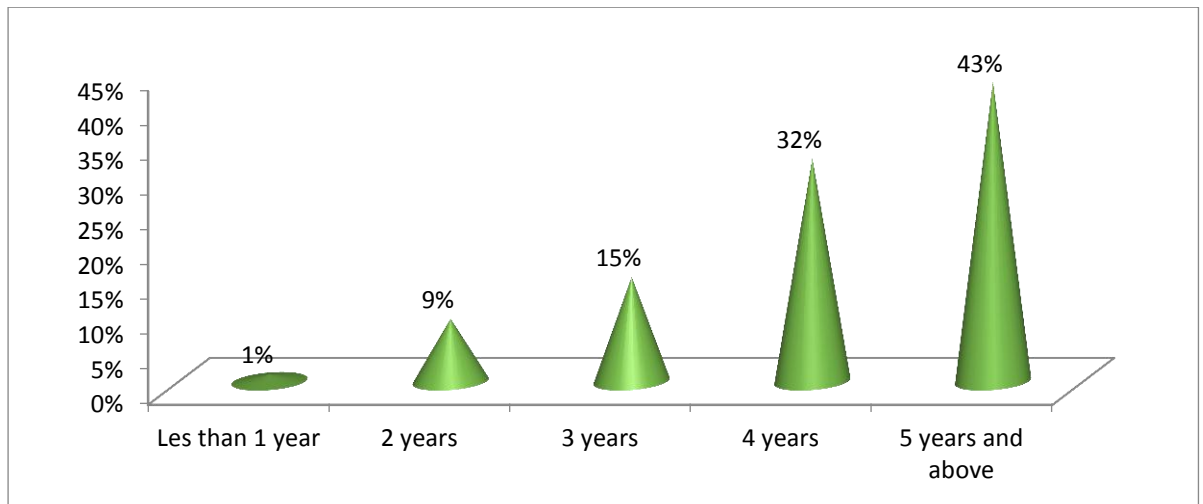


Figure 4.4. Age of the Business

Source: Research Data (2018)

As in Figure 4.4 the findings indicate that most (43%) of the respondents had businesses that had existed for over 5 years. Further, 32% indicated 4 years, 15% indicated 3 years, 9% indicated 2 years, while 1% indicated less than 1 year. This depicts that most of the business had existed for more than 5 years.

4.4. Extent of Innovation

The respondents were requested to indicate whether they agreed on statements describing the degree of SME innovation and to what extent. This was relevant in establishing the proprietors understanding of the subject; technology innovation and their uptake of the same. The findings are shown in the Table 4.3.

Table 4.3. Extent of Innovation

Extent of Innovation	Mean	Std. Dev
Introduction of new products innovations	3.76	0.1762
There is continuous improvement in processes to create value to the customer	4.21	0.2651
Introduction of new branches/business.	3.58	0.4323
Implementation of online sales through the internet.	3.70	0.2198
Use of computers.	3.66	0.1786
Partnerships or outsourcing (organizational innovation)	3.99	0.2189
improved distribution or sales methods, franchise, direct sales or distribution licenses	4.14	0.3129
Online transactions have been introduced	3.81	0.3291
There is high speed in adoption of the latest technological innovations in it is processes	4.01	0.2267

Source: Research Data (2018)

As in Table 4.3, the findings indicate that the respondents agreed that there is continuous improvement in processes to create value to the customer (mean=4.21), followed by improved distribution or sales methods, franchise, direct sales or distribution licenses (mean=4.14), there is high speed in adoption of the latest technological innovations in it is processes (mean=4.01), partnerships or outsourcing (organizational innovation) (mean=3.99), online transactions have been introduced (mean=3.81).Introduction of new products innovations (mean=3.76), implementation of online sales through the internet (mean=3.70), use of computers (mean=3.66), and introduction of new branches/business (mean=3.58). This depicts that on the extent of SME innovation there is continuous improvement in processes to create value to the customer.

4.5. Factors Influencing Diffusion of Innovation

The respondents were required to indicate whether they were in agreement and to what extent on statements describing the factors influencing diffusion of innovation. This was essential in determining the major factors that influenced acceptability of innovation in a business. The findings are shown in the Table 4.4.

Table 4.4. Factors Influencing Diffusion of Innovation

Factors influencing Diffusion of Innovation	Mean	Std. Dev
Size of the firm	3.78	0.2210
Years of operation	3.69	0.2987
Type of products	3.58	0.3120
Education level of employees	3.60	0.2834
Training	3.55	0.3009
Type of market served	3.50	0.3921
Competition	3.53	0.1872

Source: Research Data (2018)

As in Table 4.4, the findings indicate that the respondents were in agreement that size of the firm was the factor that mostly influenced diffusion of innovation (mean=3.78). This was followed by years of operation (mean=3.69), education level of employees (mean=3.60), type of products (mean=3.58), training (mean=3.55), competition (mean=3.53), and type of market served (mean=3.50).

4.6. Relationship between Innovation and Market Access

The respondents were required to indicate whether or not and to what extent they were in agreement with statements describing the relationship between innovation and market access. This was relevant in determining if indeed there existed a relationship between the two factors; innovation and market access. The findings are shown in the Table 4.5.

Table 4.5. Relationship existing between Innovation and Market Access

Relationship between innovation and market access	Mean	Std. Dev
User friendly advertisement has increased the level of networking among SMEs	3.72	0.2213
Enhanced and innovative customer relations has increased understanding on markets among SMEs	4.33	0.4210
innovation is driving competitiveness in SMEs	3.70	0.3209
SMEs identify innovative opportunities that are among available opportunities in business and exploit them for their business good	4.29	0.2198
Survival, success and growth of small business will be achieved when the SME sector is innovative	4.18	0.4082
Innovation has enabled SMEs to enter other markets such as international markets	4.20	0.2091
Innovation impact the market-oriented dimensions of products and services	3.90	0.3981
Internet is important in creating a firm's market accessibility and efficiency	3.82	0.2185
Innovation gives SMEs an opportunity to trade in 24 hours in unlimited markets	4.10	0.1982
Innovation facilitates remote access to knowledge, suppliers and a borderless environment	4.04	0.2108

Source: Research Data (2018)

Table 4.5 findings indicate that the respondents were in agreement that enhanced and innovative customer relations has increased understanding on markets among SMEs (mean=4.33), followed by SMEs identify innovative opportunities that are among available opportunities in business and exploit them for their business good (mean=4.29). Innovation has enabled SMEs to enter other markets such as international markets (mean=4.20), and survival, success and growth of small business will be achieved when the SME sector is innovative (mean=4.18). Respondents moderately agreed that user friendly advertisement has increased the level of networking among SMEs (mean=3.72), and innovation is driving competitiveness in SMEs (mean=3.70). This depicts that enhanced and innovative customer relations have increased understanding on markets among SMEs.

4.7. Inferential Statistics

Regression analysis or models are statistical tools used to study the relationship between study variables. In our study the variables were product innovation, process innovation and service innovation. A multiple regression analysis was conducted by the researcher so as to assess the relationship among predictor variables (independent) on access to markets by small medium enterprises. The correlation analysis showed the degree of the relationship between variables in the study. The regression coefficient represents the extent to which each independent variable affects the dependent variable.

4.7.1. Model Summary

Table 4.6 provides the model summary of the relationship between the predictor variables and access to markets by small medium enterprises. It further offers detailed information on how the regression line is able to account and justify for the overall variation in the dependent variable. The findings are as shown:

Table 4.6. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F-Value	P-value
1	.930 ^a	.864	.858	.239	47.341	.000

Source: Research Data (2018)

a. Predictors: (Constant), value of product innovation, value of service innovations, and value of new production processes

b. Dependent Variable: Access to Markets by Small Medium Enterprises

The analysis in Table 4.6, $R^2=0.864$ implying 86.4% variation in that access to markets by small medium enterprises is explained by predictors in the model. The difference of, 13.6% unexplained variation in access to markets by small and medium enterprises is due to other factors that were not under study. There was an identified relationship which was strong positive between the variables.

4.7.2. ANOVA Results

Table 4.7 provides the ANOVA results of the relationship between the predictor variables and access to markets by small medium enterprises. The ANOVA shows any significant statistical difference between variable means. The findings are as shown.

Table 4.7. ANOVA of the Regression

		Sum	of			
Model		Squares	df	Mean Square	F	Sig.
1	Regression	7.947	3	2.649	46.474	.023 ^a
	Residual	10.602	186	.057		
Total		18.549	189			

Source: Research Data (2018)

a. Predictors: (Constant), value of product innovation, value of service innovations, and value of new production processes

b. Dependent Variable: Access to Markets by Small Medium Enterprises

Table 4.7 indicates a 0.023 significance that is less than 0.05 thus this model is considered statistically correct and significant in predicting how the factors (value of product innovation, value of service innovations, and value of new production processes) influence the access to markets by small medium enterprises. The F critical at significance level of 5% was 2.649 since F calculated is larger than the F critical (value = 46.474). This indicates that the entire model was significant.

4.7.3. Coefficient of Determination

Table 4.8 provides the coefficient of determination on the relationship in predictor variables and the access to markets by SMEs. The regression coefficient indicates that value of the independent (predictor) variable increases with the increase of the value of the dependent variable and vice versa. The findings are as shown:

Table 4.8. Coefficient of Determination

	Unstandardized		Standardized		
	Coefficients		Coefficients		
	B	Std. Error	Beta	T	Sig.
Model 1(Constant)	0.181	0.416		0.192	0.847
Value of product innovation	0.469	0.100	0.383	4.69	0.033
value of service innovations	0.140	0.014	0.157	0.002	0.015
value of production processes	0.309	0.086	0.317	0.027	0.013

a. **Dependent Variable: Access to Markets**

Source: Research Data (2018)

Multiple regression analysis was done to establish the access to markets by SMEs and the three variables. Based on the SPSS generated in Table 4.8, the regression equation is as shown:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon \text{ becomes:}$$

$$Y = 0.181 + 0.469X_1 + 0.140X_2 + 0.309X_3 + \varepsilon$$

Where:

Y- Is the SMEs access to markets as a dependent variable

β_1 – is the co-efficient of product innovations

β_2 – is the co-efficient of service innovations

β_3 – is the coefficient of new production processes innovations

X1 – value of product innovation

X2 – value of service innovations

X3 - value of new production processes

ε = error or random term

Taking all factors into account (value of product innovation, value of service innovations, and value of new production processes) constant at zero, access to markets by small medium enterprises was 0.181. The findings analysed showed that whilst all other variables that are independent were at zero, an increase in an unit of value of product innovation will lead to a 0.469 increase in access to markets by small medium enterprises; a unit increase in value of service innovations will lead to 0.140 increase in access to markets by small medium enterprises.

A unit increase in value of new production processes will lead to a 0.309 increase in access to markets by small medium enterprises. This infers that value of product innovation contributes the most to the access to markets by small medium enterprises, followed by value of service innovations. Value of product innovation, value of service innovations, and value of new production processes were all significant on access to markets by small medium enterprises.

4.8. Discussion of Findings

The study established that the size of the firm was the factor that mostly influenced diffusion of innovation. According to Roger (1995), diffusion of innovation in SMEs is essentially through inter-firm networks. As such, the bigger the enterprise, the higher the rate of diffusion of innovation. The study further established that enhanced and innovative customer relations have increased understanding on markets among SMEs. According to Kohli & Jaworski (1990), customer needs is a critical factor in market orientation and once they are met, business gain competitive advantage.

This study brings to light the usefulness of technological innovation in businesses, for example World Wide Web has been heavily used as an avenue to place orders and make payment by use of the internet. Becheikh et al, (2006) stipulates that technological innovation is a vital element in creating a competitive edge for firms in access to markets. The World Wide Web is an extraordinary platform for growing and achieving new market openings for SMEs whereas Internet is basic in upgrading an organisation's market access and operational proficiency.

The study found that the value of product innovation, value of service innovations, and value of new production processes were all significant on access to markets by SMEs. Hughes (1997) stated that the SMEs that experienced growth in many cases had embraced product or process innovation. Based on a study done in Kenya on innovation and SMMEs, it was concluded that growth was notable in SMEs that embraced innovation (Kiraka, 2013).

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Introduction

In this chapter, summaries, discussions and conclusions of the findings were discussed. It gave recommendations on effect of technology innovation on access to markets by SMEs in Nairobi County. The findings from the study are relevant in theory to academicians, in practice to entrepreneurs and in policy to the Nairobi City County government.

5.2. Summary of the Findings

The study established that on the extent of SME innovation there is continuous improvement in processes to create value to the customer. The study showed that a firm's size was the factor that mostly influenced diffusion of innovation. The study also established that enhanced and innovative customer relations increased understanding of markets among SMEs.

Further, the study established that value of product innovation contributes the most to access to markets by SMEs, followed by value of service innovations. The value of product innovation, value of service innovations, and value of new production processes were all significant at a five per cent level of significance and a 95% level of confidence on access to markets by SMEs.

5.3. Conclusion

The study findings conclude that there is continuous improvement in processes to create value to the customer. It also concluded that the size of a firm was the factor that mostly influenced diffusion of innovation. The effect of enhanced and innovative customer relations to increased understanding of markets among SMEs was put across in the study.

The study further concluded that the value of product innovation contributes the most to the access of markets by small and medium enterprises. This was followed by value of service innovations. Value of product innovation, value of service innovations, and value of new production processes were all significant on access to markets by small medium enterprises

5.4. Recommendations of the Study

This study, in practice, stipulates that SMEs should develop effective innovation policies on marketing since marketing is one of the major determinants of their performance. Additionally, the study recommends that SMEs should regularly review their marketing strategies whilst incorporating technological innovations. In the review process SMEs should incorporate creative and innovative strategies which will improve the overall performance of the business enterprises and allow them to gain a competitive edge.

In policy, the study recommends that stakeholders including the Nairobi City County government and the National Government to initiate training programs on marketing for SMEs. This is beneficial in capacity building for entrepreneurs in increasing knowledge on marketing and technology innovation. The study also recommends that policy makers may form policies that embrace sustainable technology transfer.

In theory, this study recommends a portfolio of choices of technological innovations that proprietors and business consultants can make reference to in a bid to gain knowledge on entry to markets. This study further provides a knowledge base for academicians and researcher in their quest of understanding technology innovation and access to markets. The study findings can be used as a basis for further and future research.

5.5. Limitations of the study

The researcher was faced with various challenges while conducting the study such as time, access to some businesses, language barrier, respondents withholding key information and cultural bias. The time needed to collect data was limited especially due to delay in receipt of questionnaires from respondents. The researcher was barred from gaining access to some business enterprises while distributing questionnaires.

Further, the researcher faced language barrier challenge while collecting data from respondents who had challenges comprehending questions in English. There were instances where the respondents withheld information that was vital to the study. There were notable cases where the researcher felt culturally discriminated by the respondents.

5.6. Suggestions for Further Research

In this study we majored on the effect of technology innovation on access to markets by small medium enterprises in Nairobi County. As such, further studies should be done on all SMEs in the country to allow for a comparison on the various findings. It would also be beneficial in identifying the common dependent factors. This will help in having a general perspective on how technology innovation affects the access to markets at a national level.

Additionally, the study focused on a single County in Kenya. Research on the rest of the counties in Kenya is highly recommend to establish the different innovations on marketing strategies employed in various localities using a larger sample. This would play a big part in benchmarking for the underperforming businesses. It would further help the policy makers in identifying gaps that need to be filled, as well as strategy formulation in usage of innovation to access markets.

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APPENDICES

Appendix 1- Letter of introduction



UNIVERSITY OF NAIROBI
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SCHOOL OF BUSINESS

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P.O. Box 30197
Nairobi, KENYA

09 November 2018

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

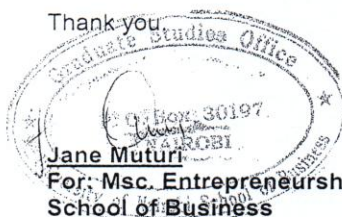
INTRODUCTORY LETTER FOR RESEARCH
GLORY GACHERI MUTWIRI – REGISTRATION NO. D66/88590/2016

This is to confirm that the above named is a bona fide student in the Master of Science in Entrepreneurship and Innovations Management (Msc. Entrepreneurship & Innovations Management) option degree program in this University. She is conducting research on *"Effect of Technology Innovation on Access to Markets by Small and Medium Enterprises in Nairobi County."*

The purpose of this letter is to kindly request you to assist and facilitate the student with necessary data which forms an integral part of the research project. The information and data required is needed for academic purposes only and will be treated in **Strict-Confidence**.

Your assistance will be highly appreciated.

Thank you.



For: Msc. Entrepreneurship and Innovations Management Co-Ordinator,
School of Business

JK/nwk

Appendix 1I- Questionnaire

Dear respondent,

The purpose of this questionnaire is to collect data that relates to the effect of technology innovation on access to market by Small Medium Enterprises. Please respond to the questions indicated to help in the process. All information will be considered confidential and will only be used for academic purposes alone.

Section A: Demographic Information

1) What is your gender? (tick one)

Male Female

2) Age(tick one)

20 20 to 30 30 to 40 40 and above

3) Highest level of education achieved.

No formal education []

Primary level []

Secondary level []

College level []

University level []

4) In what business entity are you engaged in? (Tick)

Manufacturing [] Retail [] Trade [] Service []

5) How old is your business?

Less than 1 year [] 1 year [] 2 years [] 3 years [] 4 years []

5 years and above []

SECTION B: Extent of Innovation

Below statements describes the extent of SME innovation. Do you agree/disagree with them and to what extent in the context of your organization? {Tick (√) the appropriate column}(1)Strongly disagree (2) Disagree (3) moderately agree (4) Agree (5) Strongly Agree

Extent of Innovation	1	2	3	4	5
Introduction of new products innovations					
There is continuous improvement in processes to create value to the customer					
Introduction of new branches/business.					
Implementation of online sales through the internet.					
Use of computers.					
Partnerships or outsourcing (organizational innovation)					
improved distribution or sales methods, franchise, direct sales or distribution licenses					
Online transactions have been introduced					
There is high speed in adoption of the latest technological innovations in it is processes					

Section C: Factors Influencing Diffusion of Innovation

Below statements describes the factors influencing diffusion of innovation. Do you agree/disagree with them and to what extent in the context of your organization? {Tick (√) the appropriate column}(1)Strongly disagree (2) Disagree (3) moderately agree (4) Agree (5) Strongly Agree

Factors influencing diffusion of innovation	1	2	3	4	5
Size of the firm					
Years of operation					
Type of products					
Education level of employees					
Training					
Type of market served					
Competition					

Section D: Relationship between Innovation and Market Access

Below statements describes the relationship between innovation and market access. Do you agree/disagree with them and to what extent in the context of your organization? {Tick (√) the appropriate column}(1)Strongly disagree (2) Disagree (3) moderately agree (4) Agree (5) Strongly Agree

Relationship between innovation and market access	1	2	3	4	5
User friendly advertisement has increased the level of networking among SMEs					
Enhanced and innovative customer relations has increased understanding on markets among SMEs					
innovation is driving competitiveness in SMEs					

SMEs identify innovative opportunities that are among available opportunities in business and exploit them for their business good					
Survival, success and growth of small business will be achieved when the SME sector is innovative					
Innovation has enabled SMEs to enter other markets such as international markets					
Innovation affects the market characteristics of products and services					
Internet is important in creating a firm's market accessibility and efficiency					
Innovation gives SMEs an opportunity to trade in 24 hours in unlimited markets					
Innovation helps in creating access of information and knowledge, suppliers and external environment					