INNOVATION AND USE OF TECHNOLOGY AS STRATEGIC TOOLS IN SMALL AND MEDIUM ENTERPRISES OPERATING IN TURBULENT ENVIRONMENTS

BY

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UNITED STATES INTERNATIONAL UNIVERSITY - AFRICA

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A Project Report Submitted to the School of Business in Partial Fulfillment of the Requirement for the Degree of Masters in Business Administration (MBA)

UNITED STATES INTERNATIONAL UNIVERSITY-AFRICA

SUMMER 2017
STUDENT’S DECLARATION

I declare that this is my original work and has not been submitted to any other college, institution or university other than the United States International University in Nairobi for academic credit.

Signed: ...................... Date: ......................

Carol Njihia (I.D No) 645163

This project has been presented for examination with my approval as the appointed supervisor.

Signed: ...................... Date: ......................

Prof. Peter Lewa
Supervisor

Signed: ...................... Date: ......................

Dean, School of Business
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ABSTRACT

The purpose of this study was to investigate innovation and technology as a strategic adaptation towards turbulent environments in SMEs. The objectives used in the study were to determine the business owners experience with turbulence, to find out how they use innovation and technology as a strategy to cope with turbulence in SMEs, the major challenges faced when it comes to implementing innovation and technology as a strategy and what other strategies that are commonly used to cope with the turbulence in the environment.

The researcher used a descriptive survey to ensure that the research problem is well constructed and understood. The study employed the use of questionnaires to extract significant data from participants of the study. The study focused on 250 participants and through use of random, Convenience and Judgmental sampling to establish the sample size of 153 respondents out of which 140 responded giving a response rate of 93%.

The research based on the objectives revealed that social and technology factors had the most effect on competition in the SMEs whilst availability of credit and credit rating had a huge influence on performance. Respondents agreed that adopting latest technology to some very great extent was vital to maintain competition. It was also revealed that management capability determines the effectiveness of innovation and technology applied. Access to funding has also limited the uptake of innovation, lack of strategic planning to some moderate extent caused poor innovation uptake.

The study concluded that due to turbulence changes that are taking place in the environment, SMEs are experiencing intense completion due to social and technological factors, competition from competitors due to their position in the market, product diversification, and location. However, SMES are able to achieve a competitive advantage by creating a relationship with their suppliers hence being able to get resources of high quality. It was also concluded that the use of latest technology has played a big role in maintain a competitive advantage. In addition, innovation strategies also enable SMEs to come up, customer care, product and service innovation strategies that they can use to become more competitive hence increase is quality of products and services. It was also concluded that management capability determines the effectiveness of innovation and technology applied. Lack of funds
can also hinder the use of innovation strategy hence affecting strategy planning and implementation.

It was recommended that Social, technological, political, ecological and economic factors are examples of challenges SMEs faces. SMEs should be more aware of ecological changes that are taking place in the environment hence become more competitive and adapt to turbulence environment. It was also recommended that SMEs should become more innovative and develop marketing innovation strategies that will enable them make customer aware of their products hence increase in profit. Through product innovation strategies, SMEs will also be able to increase their product and service quality and respond to customers taste and preference. SMEs should ensure that it has sufficient funds and management capabilities to enable them become more innovative and develop use of technology hence, becoming more competitive. SMEs should also facilitate export competitiveness by increasing global market and strengthen global value chains.

The study recommends that further studies should be done to identify other factors that affect innovation and use of technology as a strategic tool operating in turbulent environment. Furthermore, this study was based on SMEs only. It is therefore recommended that a similar research is done in other organizations to determine whether the factors affecting innovation and use of technology in SMEs are similar to another.
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DEDICATION

To my father Mr. Njihia, mother Mrs. Njihia and my three siblings. Without whose encouragement it would not have been possible to complete. Thank you for your encouragement, love and care during this involving time.
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CHAPTER ONE

1.0 INTRODUCTION

The introduction gives a background of the research question and the basis for which this research is being conducted stating the objectives for the study and also defining the key terms that are going to be used in the research.

1.1 Background of Study

Since the beginning of the 21st century innovation and technology has been one of the fundamental aspects of industrial and economic development policies in many countries. The political agenda in most advanced economies always includes programs aimed to improve innovation capabilities of companies to create distinct products and services. In part, this institutional trend has been spurred by the traditional academic support of innovation as a key capability for the long-term sustainability of companies. Schumpeter (1934) pointed early in the 20th century at the importance of innovation as a driver for economic growth. Later, Porter (1980) proposed that the competitiveness of nations depended on the ability of an industry to innovate and improve, and that companies achieve competitive advantage through innovation. Thus, innovation has proved to be important at the company level as well as on a national level. The theoretical and empirical analysis accumulated over the last few decades about the impact of innovation management on performance, however, have brought only a few conclusive results, especially in Small and Medium Enterprises (Tidd, 2006).

Strategic adaptation definition shows a theoretical link between innovation and competitiveness. The process of strategy is considered a dynamic process with adaptation being the key aspect needed to achieve competitive advantage in a long-term perspective (Miles & Snow, 1978; Floyd & Lane, 2000; Child, 1997).

The process of adaptation is not seen as an uninhibited phenomenon, but rather as the result of complex interactions that consider the changes in the external environment on one side, and, on the other side, the internal environment (existing resources, organizational structure and managers' profiles of the company, company characteristics, size, patrimonial structure, etc.). The process of adaptation is also affected by previous decisions on strategic positioning. This "systemic" approach tries to reconcile contingency theory and strategic positioning thinking, and distinguishes between two intertwined dynamics: an internal structuring (internal actions addressed to adapt...
organizational agents to new environmental conditions) and an external structuring (actions that modify the firm's relationship with its environment, such as launching new products or changing suppliers) Child, 1997.

Innovation is described by Linder et al. (2003) as “implementing novel ideas that create value”. This general description refers to the various forms that innovation can take such as, the deployment of new process technologies, product development or by innovative management practices (Zott, 2003; Glynn, 1996). From a practitioner’s perspective, this means that the adoption of new products and processes can be used to increase competitiveness and overall profitability, based on customer needs and preferences (Zahra et al., 1999; Mone et al., 1998). For the purpose of this research the definition of innovation which will be used is as follows “the identification, application and exploitation of a new product, process or marketing opportunity by the business which increases its capability to generate wealth and strengthens its competitive position” (Frances, 2001).

Turbulence is defined as dynamism in the environment, involving rapid, unexpected change in the environmental sub-dimensions (Conner, 1998; Vorhies, 1998). A stable environment changes a little, but when it does, the change is expected. In turbulent environments, there are many unexpected changes. Turbulence has become the natural state of the world today (Benton and Lloyd, 1992; Mintzberg, 1994). It is caused by changes in, and interaction between, the various environmental factors especially because of advances in technology and the confluence of computer, telecommunications and media industries (McKenna, 1991; Samli, 1993; Iansiti, 1995).

SMEs can be defined using headcount, annual turnover or annual balance sheet and the number of employees. Throughout the world these criteria are determined by each country or economic area. (European Commission, 2005, as cited by Festing and Engle, 2008).

Since the 1960s to date, small and medium sized enterprises (SMEs) have been given due recognitions especially in the developed nations for playing very important roles towards fostering accelerated economic growth, development and stability within several economies (Yitzhaki, 2006). They make-up the largest proportion of businesses all over the world and play tremendous roles in employment generation, provision of goods and services, creating a better standard of living, as well as immensely contributing to the
gross domestic products (GDPs) of many countries (OECD, 2000). Over the last few decades, the contributions of the SMEs sector, the development of the largest economies in the world have beamed the searchlight on the uniqueness of the SMEs; and this have succeeded in overruling previously held views that SMEs were only miniature versions of larger companies (Al-Shaikh 1998; Gaskill et al. 1993).

Although Small and Medium Enterprises have been at the center of the policy debate for quite some time in both developed and developing countries, little analytical work has been undertaken in this area. The dearth information that exists among researchers on Small and Medium Enterprises however provides a sense of how important this sector is for sustainable development in emerging economies (Medina, 2001). For instance, recent studies conducted by United Nations Industrial Development Organization (UNIDO) concur that SMEs are: labor-intensive, providing more opportunities for low-skilled workers, correlated with lower income distribution inequality, necessary for agriculture-dependent nations transitioning to an industrial-and service-oriented economy, excellent sites for innovation and sustainable initiatives due to their inherent flexibility and risk-taking ability (Patricoff & Sunderland, 2005).

In both the UK and Nigeria, the SMEs sector constitutes the largest proportion of the entire businesses. In the UK for instance, SMEs represent over 95 percent of all businesses and contribute over 65 percent of the labor force as well as over 30 percent of the GDP (Day 2000; Dewhurst and Burns 1993). Likewise, In Nigeria, data from the Federal Office of Statistics reveal that about 97 percent of the entire enterprises in the country are SMEs and they employ an average of 50 percent of the working population as well as contributing up to 50 percent to the countries industrial output (Ariyo, 1999; Ihua, 2005).

The Small enterprises outnumber large companies by a wide margin and also employ many more people. SMEs are also said to be responsible for driving innovation and competition in many economic sectors. The sector also plays a key role in employment creation, income generation and is the bedrock for industrializing the Country in the near future.

It is estimated that there are 7.5 million SMEs in Kenya, providing employment and income generation opportunities to low income sectors of the economy. The Sector has continued to play a vital role in the economy of this country. The sector’s contribution to
the Gross Domestic Product (GDP) has increased from 13.8 per cent in 1993 to about 40 per cent in 2008. The Small Enterprise Sector or Informal Sector provided approximately 80% of total employment and contributed over 92% of the new jobs created in 2008 according to the Economic Survey of 2009. SMEs are significant contributors to the global economy accounting for approximately 50% of local National GDP, 30% of export and 10% of FDI.

Globally, the growth of any economy is dependent on vibrant SMEs and when the reverse seems the case, the entire economy suffers. The stunted growth of the economy has often been blamed on many factors, top of which is the challenge of financial constraints. The role of finance has been viewed as a critical element for the performance of small and medium-sized enterprises. Previous studies have highlighted the limited access to financial resources available to smaller enterprises compared to larger organizations and the consequences for their performance and development (Levy, 1993).

Typically, smaller enterprises face higher transactions costs than larger enterprises in obtaining credit (Saito and Villanueva, 1981). Insufficient funding has been made available to finance working capital (Peel and Wilson, 1996). Poor management and accounting practices have hampered the ability of smaller enterprises to raise finance. Information asymmetries associated with lending to small scale borrowers have restricted the flow of finance to smaller enterprises (Kinyua, 2014)

Despite these claims however, some studies show a large number of small enterprises fail because of non-financial reasons (Liedholm, MacPherson and Chuta, 1994). Study by Tushabonwe-Kazooba (2006) revealed that poor record keeping and lack of basic business management experience and skills are major contributors to failure of small business. Researchers have also identified lack of access to external finance and weak capital base, inexperience in the field of business, particularly lack of technical knowledge plus inadequate managerial skills, lack of planning and lack of market research as causes of small business failure (Lussier, 1996; Murphy, Shleifer & Vishny, 1996; Van Stel & Storey, 2004).

1.2 Statement of the Problem
SME’s are faced with uncertain and turbulent environment. Uncertainty means that a decision makers do not have sufficient information about environmental factors and they have a challenging time predicting. S.M.E’s must cope with and manage uncertainty to be
effective (Daft, 2010). According to Eisenhardt and Sull (2001) strategy in turbulent environments should be flexible but disciplined which then needs a set of strategic rules that can be of help to managers to cope with opportunities and threats coming rapidly at them without having to seek after their superiors or do slow strategic planning exercises.

Also, small firms are put off by the very idea and word innovation. Over emphasis by agencies and policy-makers on formal research and development which so often has become the yardstick for measuring the levels of innovation in the small and medium enterprises. While the advantages of the small and medium enterprises in relation to innovation are those which relate specifically to their size dynamism, internal flexibility, short lead times and responsiveness to change, the barriers to innovation have been identified in general as: A general lack of suitably qualified technical specialists within small firms. Thus, the small firms are generally unable to support a formal R & D effort on an appreciable scale which leads to less innovation.

S.M.E’S often lack the time and resources to identify and use external sources of information, technical and scientific expertise. Thus, small firms in general are unable to access formal R & D Programmers and generally engage in product and process improvement rather than radical or new technological developments. S.M.E’S often experience great difficulty in attracting capital, especially risk capital. Innovation, especially new product development, will generally represent a disproportionately large financial risk for the small firm and therefore often becomes impossible for small firms to fund. Added to this is the inability of the small firm to spread the risk over a portfolio of projects due to their limited resources. In some areas/sectors the scale of economics forms a substantial entry barrier to S.M.E’S, as they experience an inability to offer integrated product lines or services. S.M.E’S experience difficulty in acquiring external capital necessary for rapid growth and many entrepreneurial managers are often unable to cope with the increasing complex organizational and decision-making processes necessary to manage such growth. All these are challenges faced by SMEs that need further clarification I terms of understanding how SME’s measure their success when it comes to implementing innovation and technology as a strategic adaptation to cope with turbulence and stay competitive with other firms.
1.3 Purpose of the Study
The purpose of this study was to examine the influence innovation and use of technology as strategies have on small and medium enterprises operating in turbulent environments.

1.4 Research Questions
1.4.1 What are the business owner’s experiences with turbulence in the S.M.E’s sector?
1.4.2 How is innovation and technology used to cope with the turbulent environments?
1.4.3 What major challenges and solutions do SME owners experience when it comes to implementing innovation and technology as a strategy to stay competitive?

1.5 Importance of the Study
1.5.1 Small and Medium Enterprise Owners and Investors
This paper is of benefit to small and medium enterprise owners that will give a clear perspective on how to cope with turbulence and cost-effective measures on implementing innovative strategies in their businesses.

1.5.2 Management of Small and Medium Enterprises
The strategists will also be beneficiaries by emphasizing a new way to consider the future management and strategies of their companies. Businesses and markets are complex adaptive systems and understanding of how to cope in complex and turbulent environments is necessary, but has not been widely researched.

1.5.3 Academic Research
The study would be of importance in enhancing management theories since S.M.E’S would be in a position to restructure their performance in such a way as to enable them meet overall organizational effectiveness and performance.

1.6 Scope of Study
The research was done on SMEs across Nairobi. The population of choice was the business owners themselves and the top management in those that have a bit of structures. The field research was done between January and March 2017 where the researcher visited the companies and administered questionnaires to the population.

The limitations encountered were in relation to response rate due to the availability of the business owners. Most of the businesses were also shy towards answering my questionnaires in order to maintain privacy in their businesses which was often a common
trait with the Small and Medium business owners. The researcher mitigated the problems by convincing the management that the knowledge acquired from the study was of benefit to their businesses and that the knowledge was distributed once conclusions were drawn. Privacy was also maintained for the purpose of those that may feel weary of the study.

1.7 Definition of Terms
The definitions presented here are going to be the key definitions used all across the whole research.

1.7.1 A turbulent environment
It is an environment in which one cannot predict the outcome of one’s actions (Dankbaar, 1996). Stigter (2002) made a compilation of those concepts in a tentative to understand how SMEs should position themselves in a way that bring success even (or specially) in turbulent environments. A turbulent environment is characterized as difficult to understand and requires a flexible organization to respond quickly and adequately in order to remain competitive. The author Stigter concludes that a turbulent environment consists in a situation that is subject to continuous and substantial changes which are uncertain and unpredictable.

1.7.2 Innovation
Innovation is defined by Linder et al. (2003) as “implementing new ideas that create value”. This general description refers to the various forms that innovation can take such as product development, innovative management practices or the deployment of new process technologies (Zott, 2003; Glynn, 1996).

1.7.3 Strategic adaptation
This is considered an active process, with which adaptation being the key aspect needed to achieve competitive advantage in the long run (Miles & Snow, 1978; Floyd & Lane, 2000; Child, 1997).

1.7.4 Small and Medium Enterprises (SME’S)
They can be defined using headcount, annual turnover or annual balance sheet and the number of employees. Throughout the world these criteria are determined by each country or economic area. (European Commission, 2005, as cited by Festing and Engle, 2008).
1.7.5 Technology
It is a way to produce something. This is a very broad definition which includes most activities that lead to value creation by corporations. A new product that is developed is a technology if it provides the consumer better health, higher caloric intake or enhanced welfare. A new service is also a technology if it reduces the anxiety of the consumers over the risk they face, if they give them the pleasure of enjoying a vacation or a smoother way to process a payment. Of course technology is also something that makes companies more productive because they can use more advance machines and software or because they can organize more efficiently their productive process (Inkaterra, 2014).

1.8 Chapter Summary
The study was basically about turbulence in Small and Medium enterprises and how the business owners use the Innovative strategy to cope and remain relevant in the market whilst competing with the big Corporations that are in the same industry as they are. The study was conducted in Nairobi where there are a number of S.M.E’s popularly known as the ‘Juacali’ sector. Chapter 2 is on the Literature Review. In Chapter 3 and the research methodologies which constitute the whole research proposal are presented. Chapter four presents the results and findings of the study whereas chapter five brings forth the discussions, recommendations and conclusion.
CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction
This chapter is a summary of literature done by other researchers in the same field of study. The specific areas covered here are; theoretical foundation of the study, turbulence in the SME businesses, innovation and technology in the SME business sector, any other strategies used to cope with turbulent environments and challenges faced when trying to stay competitive in turbulent environments for Small and Medium enterprises.

2.2 Turbulence in the S.M.E Sector
The study seeks to explore the theories that explain turbulent environments, innovation and technology in SME’S and small and medium enterprise management.

2.2.1 Turbulence
Turbulence involves rapid, unexpected change in the environmental sub-dimensions (Conner, 1998). It is caused by changes in, and interaction between, environmental factors, including technology and the confluence of the computer, telecommunications, and media industries. (Mason, Staude, & Mason, 2009) This turbulence results in less orderly competition, quicker development cycles, increasing need for information and more difficulty in predicting customer, product and service preferences (Chakravarthy, 1997). The net result of these changes is an environment with strong uncertainty, which states that the future is beyond understanding (Wilkinson and Young, 1998).

In turbulent environments, there are many unexpected changes. Turbulence has become the natural state of the world (Benton and Lloyd, 1992; Mintzberg, 1994). It is caused by changes in, and interaction between, the various environmental factors. The result of this growth in environmental turbulence has been less orderly competition, an increasing need for information, innovation and quicker cycles of development, and more difficulty in predicting customer, product and service preferences (Achrol, 1991; Pine et al., 1993; Haleblian and Finkelstein, 1993; Chakravarthy, 1997). Thus, decision making windows have lessened, risk of obsolescence is greater, long-term control has become impossible and managers have to learn new ways to operate in turbulent environments (Davis et al., 1991). The net result of these changes is an environment that Lynch (1995, p. 46) refers to as “chaotic, fragmented and unpredictable and complex and turbulent (Mason, 2007).
Another method frequently cited (Kipley & Lewis, 2009a and 2009b; Campbell, 2010; Edelmann and Benning, 1999; Carver & Kipley, 2010); to measure turbulence is provided by Ansoff & McDonnel (1990). In their work, they classified turbulence in 5 different levels.

The matrix below provides a visualization of the five levels of turbulence, as well as a 5 points scale useful to help categorize the actual stage in which an organization may be.

![Turbulence Levels Matrix](image)

**Figure 2.1: Turbulence levels (Ansoff and McDonnel, 1990)**

The level 1 is the “repetitive” level, where the environment basically repeats itself day by day, without major changes. Level 2 represents the “expanding” stage, where the change is incremental, slow, visible, and predictable. The level 3 is the “changing”. The environment presents now a fast pace of change, though it is still incremental and fully visible. Levels 4 and 5 are where the turbulence is strongest. At level 4, “discontinuous”, the changes are not incremental. It presents a limited visibility, partial predictability, rapid change and usually an inability from the firm to react to the new change within the required time frame. The level 5 is known as “surprising”. Changes at these levels occur without notice, without visibility, unpredictable and extremely rapid. (Jacob, 2011)

### 2.2.2 Turbulence in Small and Medium Enterprises

Stigter (2002) points out that SMEs are confronted with changes in their business environments. These changes originate from different forces, like political, demographic, economic, legal, technological, infrastructure, ecology and social forces. The author Van Noort (1999) emphasizes that the main forces “globalization, internationalization,
innovation, technology and mass individualization” as the most influencing elements in the environment of SMEs.

2.2.3 Environmental Turbulence

Small and medium enterprises are the most important sources of job creation and local development in increasingly knowledge based economies. As turbulence in globalized economies expands, SMEs will have to learn to sustain competitiveness in this new kind of environments by developing their dynamic capabilities.

The survival and growth of organizations are subject to a composite of a macroeconomic sector and market dynamics that are highly fluid and have considerable influence on the business environment. There is consensus that organizational survival is very much dependent on the response and adaptation of organizations as a consequence. Of particular interest to this paper is the SME-focused research by Kitching et al. (2009a, 2009b), Price et al. (2013) and Soininen et al. (2012) who extended the earlier seminal inquiry by Ward et al. (1996) on the impact of environment turbulence on business strategy. (Authors, 2016) The “business environment” incorporates the following three dimensions: Environmental turbulence”, defined by rates of industrial innovation alongside the unpredictability of the competition and market direction (Kipley et al., 2012). Environmental hostility defined by levels of threat as a result of complex, intense and volatile competition and supply chain to the organization (Zahra et al., 2000). Environmental heterogeneity”, defined by market diversity and the resultant variation in manufacturing and marketing strategies developed in response (Porter, 1980).

2.2.4 Political Turbulence and Uncertainty

Turbulence can generally be described as a setting of confusion and disorganized change. In a market, turbulence is characterized by frequent and, to some extent, unexpected changes. Thus, we define political turbulence as a situation where political changes are disorganized and cause confusion for the market actors. If turbulence prevails in the market, it is difficult to predict the outcome of the behavior of various actors (Johanson, 2002). Johanson (2002) argued that a main characteristic of market turbulence was when institutional changes are frequent, unpredictable and extended over a longer period of time. Thus, when the prerequisites for business behavior constantly change, we can assume that turbulence exists in the market environment.
A main problem shown by Johanson (2002) is that the response of firms to institutional changes increases the turbulence created. Firms interpret institutional changes heterogeneously, thus different responses will take place. This type of market turbulence is expected to be an outcome of frequent institutional changes (Mikael, Sussane, Firouze 2015). A main driver of institutional changes, and thus determinant of the market turbulence, is political initiatives taken by national and transnational governmental authorities. Such political initiatives can be classified as coercive or supportive. Coercive political impact refers to legislative rules that firms must follow when political actors use their legitimate power to apply restrictions to firms’ activities. Governments are then a source of a wide range of political goods that potentially benefit firms in their market exchanges: public sector contracts; industry policies and regulations; licenses and approvals support in the form of tax concessions, tariffs; and other protectionist measures.

2.2.5 Technological Turbulence
Technological turbulence is about the rate of change of product and process technologies used to transform inputs into outputs (e.g. Kohli and Jaworski, 1990; Jaworski and Kohli, 1993). Moorman and Miner (1997) are slightly narrower, focusing specifically on change associated with new product technologies. Some might consider technological turbulence probably the single most important component. For example, Mason (2007) says that environmental turbulence is caused by changes in, and interaction between, the various environmental factors especially because of advances in technology and the confluence of computer, telecommunications and media industries (Ngamkroeckjoti, Speece, & Speece, 2010). Technological turbulence does have an impact on strategy formulation. Certainly, companies need information to make strategic decisions, and keeping up with technological developments is very important for competitiveness in many industries (Subba Narasimha et al., 2003). Technology turbulence points out that customers may not be aware of new technologies, so aiming to anticipate and influence market trends may work better.

2.3 Innovation and Technology as A Strategy in Small and Medium Enterprises
Small and medium-sized enterprises (SMEs) are of particular interest in the study of innovation. It has been argued that they are disproportionately responsible for significant innovations, and one estimate suggests they contribute more than twice as many innovations per employee as large organizations (Vossen, 1998). SMEs are also claimed to increase the variety and range of products and services (Storey, Barnett, & Storey,
It has been said that ‘SMEs do not necessarily innovate in formally recognized ways. It is likely that they make much more extensive use of external linkages and emphasize process innovation as much as product innovation.

2.3.1 Innovation and Technology

The innovation process is associated with a variety of problem-solving activities when people from different functions and organizations interact and engage with each other in a dynamic environment. The search for solutions typically requires the simultaneous use of different input factors. Given that innovation is a cross-functional and knowledge-intensive process, knowledge is seen as a particularly important resource to dynamic capabilities in product innovation (Liao, Barnes, Liao, & Barnes, 2015).

The innovation literature to date has tended to view innovation, broadly defined as the development and implementation of new ideas by people within and institutional order (Van de Ven et al., 1989, p. 590) and for commercial purpose, as a sequenced set of (managed) activities This has resulted in a rich body of generic best practice literature and implicit assumptions of easy transferability of such practice from larger to smaller businesses (Edwards, 2000; Tidd, 2001). In parallel, the majority of empirical studies are prediction-focused variance studies, which assume innovation as invariant. By and large, innovation research is still considered to be short of conclusive findings and comprehensive frameworks, or seen as overly static, or inadequately addressing the complex dynamics of innovation in specific organizational and industry settings (Hotho, Champion, Hotho, & Champion, 2011)

Hence what counts as an innovation is the common attribute attached to an innovation is, of course, “newness”. But, the question becomes: new to whom or new in what way, there is simply no objective way to distinguish innovation from non-innovation as innovations come in many shapes, shades and degrees. First, we have the categorization, already suggested by Schumpeter (1934), where we categorize the types of innovation on the basis of the object of change, for example, product, process, market and organizational innovations. Second, we may try to make a difference between innovations on the basis of their “newness” or based on the extent of change.

According to this view, radical innovations are those more or less ground-breaking changes, which, in very exceptional cases though, may even serve as the trigger for completely new technological trajectories (Dosi, 1982; Utterback, 1994). This then may
lead to four different kinds of objects of change, i.e. product, process, market or organizational innovations. Additionally, the extent of change associated with innovation may be depicted in terms of complete newness or significant improvement (Waleed, 2015). This then leads to the prototype for industrial innovation that is considered as open innovation.

2.3.2 Open Innovation

Open Innovation has been proposed as a new paradigm for industrial innovation management, according to which companies should use ‘purposive inflows and outflows of knowledge to accelerate innovation, and to expand the markets for external use of innovation, respectively. Open Innovation has therefore two intertwined dimensions (Chesbrough and Crowther, 2006): Inbound Open Innovation, which is the practice of leveraging the technologies of others by accessing their technical and scientific knowledge (through, e.g., in-licensing, minority equity investments, acquisitions, R&D contracts); Out-bound Open Innovation, which is the practice through which firms transfer their technologies to external organizations for commercial exploitation (through, e.g., out-licensing, new venture spin-out, sale of innovation projects, joint ventures) (Bianchi, Orto, Frattini, & Vercesi, 2010).

Open innovation describes a cognitive frame-work for a firm’s strategy to profit from innovation. It proposes that firms should purposively use inflows and outflows of knowledge to accelerate internal innovation, and to expand markets for external use of innovation, respectively. Most research on open innovation differentiates between two concepts of open innovation: inbound where new ideas flow into an organization and outbound where internally developed technologies and ideas can be acquired by external organizations with business models that are better suited to commercialize a given technology or ideas (Brunswicker & Vanhaverbeke, 2015).

2.3.3 Technology

On the other hand, Technology is a way to produce something. A new product that is developed is a technology if it provides the consumer better health, higher caloric intake or enhanced welfare (‘Inkaterra,” 2014) A new service is also a technology if it reduces the anxiety of the consumers over the risk they face, if they give them the pleasure of enjoying a vacation or a smoother way to process a payment. Of course, technology is also something that makes companies more productive because they can use more
advance machines and software or because they can organize more efficiently their productive processes. Lichtenthaler (2007) defines technology intelligence as ‘the process of systematic acquisition, assessment and communication of information on technological trends in order to detect opportunities and threats in a timely manner (Bianchi et al., 2010).

2.3.4 Small and Medium Enterprises
SME contribute to developing countries economic growth and transformation by offering work to wider population. SME’s are a very heterogeneous group and are present in many diverse activities. The definition of SME does vary from one country to another because of different business laws and infrastructures, both physically and legally. SME’s generally are defined as private companies that are relatively small compared to other firms in the market or industry. In an attempt to define the average firm several authors refer to the quantitative aspect. They classify it according to the number of people in its workforce, which is between 50 to 500 employees in France, Canada and Africa, some authors extend their definitions to include firs with up to 2000 employees (Hafsi, Bernard & Plaisent, 2014).

Small and medium enterprises (SMEs) are different from large organizations. These differences primarily relate to such defining SME characteristics as a reactive, firefighting mentality, resource limitations, informal strategies, and flexible structures (Hudson, Smart, and Bourne, 2001; Qian and Li, 2003). As a consequence, they tend to have a failure rate higher than that of large organizations. The United States Small Business Administration (SBA) found that 24 percent of all new businesses in the United States failed within two years, and that 63 percent failed within six years (Wheelen & Hunger, 1999). Lu and Beamish (2001) observed similar failure rates in Australia, the United Kingdom, Japan, Taiwan, and Hong Kong. Wheelen and Hunger (1999) found the high failure rate to be largely due to informal strategic planning processes and a lack of systems to keep track of the SMEs’ performance (Journal, 2010).

The Theory of Economic Development states that innovation is an opportunity for entrepreneurial firms because it generates income through the temporary creation of a monopoly. (Mikael, Susanne, Fiouze, 2015)) According to Porter (1980), introducing innovative products, processes, or business models creates opportunities for SMEs to
stand out in the competitive landscape. SMEs can also override price competition by offering highly innovative products and processes.

Studies have examined the issue of innovation relating to company size with inconclusive findings. Bertschek and Entorf (1996) suggest that small and large firms are more innovative than those of intermediate size. Cohen (1995) argues that larger-size companies show a better position in the adoption of new technology. However, according to Zatezalo and Gray (2000), small organizations are more innovative than larger ones, although their implementation of innovations may be slower, due to lack of resources. Larger firms tend to create a bureaucracy that is unfavorable to an atmosphere encouraging creativity, and tend to be less flexible than smaller firms (Mikael, Susanne & Fioze, 2015).

It also has been suggested that innovation represents the most effective means to deal with the turbulence in external environments (O’Regan & Ghobadian, 2004). Most firms innovate when they can see new market potential or when there is a competitive pressure in their market situation. First, fast technological advances significantly shorten the life cycle of existing products, erode the competitive advantage of even well-entrenched firms, and propel other firms to the forefront (Tushman & Anderson, 1986). Firms must enhance their innovation strength and seize the opportunities that new technologies create to advance next-generation products; otherwise, they will be squeezed from the market (Li and Calantone, 1998). Second, in a dynamic market in which consumer preferences are unstable and change quickly, identification of consumers’ changing needs becomes increasingly difficult, and incremental innovations are unlikely to satisfy them. In such a market, companies could become more innovation oriented to provide offerings that precede customer needs and create customer demand by reshaping the way customers behave (Sorescu et al., 2003). Third, intense competition which is characterized by severe price wars, heavy advertising, diverse product alternatives and added services makes two options especially desirable. One is to internalize the competitors’ strength simply through imitation, thereby leading to fewer tech-based innovations. The other is nullifying the competitors’ strength by identifying a new segment and serving new customers who have a different value system, in other words, they can introduce market-based innovations that target a niche market (Mikael, Susanne, & Fioze, 2015).
There are different types of innovations, in this work and following Johne and Davies (2000), three main types of innovations are considered: product; process; and market. Product innovation refers to the improvements made on the mix of products of the company that is, the choice of new products and their development. Product innovation is often made in technology driven companies and helps companies in their competitive positioning while retains market presence, not only in radically changed products but also in differentiating the offerings (Craig and Hart, 1992). Market innovation is concerned with the mix of markets of the company and how chosen markets are best served while accurately interpreting buying preferences (Johne, 1999).

This directly influences the sales and lately the company results. Process innovation embraces reengineering the business process (Cumming, 1998) and therefore implies the improvement of the internal operations and capacities. The importance of process innovation is quite well understood, especially in companies under threat since it may help to improve the company productivity (Otero-neira, 2014). These are some of strategies SME’s could use as a strategy to competitive.

2.4 SME’s and The Challenge of Innovation and Technology
This section discusses the challenges that the researchers have found that may pertain to SMEs and their response to innovation and technology.

2.4.1 Challenges of innovation and Technology
SMEs are generally characterized as having the ability to respond faster to changing needs which has significant implications for innovation. However, SMEs face challenges of lack of knowledge, skill, and people, etc. Unlike large firms, SMEs with limited financial resources and insufficient managerial infrastructure tend to rely less on costly R&D investment for innovation activities. SMEs also do not have abundant resources available for human capital development, which enables R&D personnel to self-generate new knowledge (Liao et al., 2015).

The SME innovation literature, while rapidly growing, also shows a range of generic biases, the strongest one possibly being its emphasis on determinants of innovation efforts and results (Tidd et al., 2001; Bessant et al., 2005) and a tendency to provide generalized or generic rather than contextualized management guidance. Thus, factors facilitating or hindering innovation have been related to external and internal, structural and resource factors, and their possible correlations. External factors include government regulations,
policy actions, and relative access to funding, weak contract enforcement, or local labour markets, levels of networks and relationships or knowledge networks (Rothwell, 1989; Lange et al., 2000; Blundel and Hingley, 2001; Keizer et al., 2002; Bougrain and Haudeville, 2002; NESTA, 2008a, b, 2009) and, to an extent, local environmental characteristics (Hadjimanolis, 1999; Littunen, 2000).

Industry structure and lifecycle stages also impact on innovation and business growth and opportunities (O’Gorman, 2001). Internal variables include resources such as management capability, expert skills, time, internal funds, but also systems, in particular knowledge systems (Delahaye, 2005), or organizational variables including structures, cultures and norms and leadership (McAdam et al., 2004; Tidd et al., 2001; Keizer et al., 2002; O’Regan et al., 2005). There is also a problem in the capacity of companies to implement and develop the technologies that would make them more productive. In this alternative view, companies lack an essential factor to implement technologies, technological knowledge. Knowledge is not something companies can buy in the market. And therefore, they have to stick with the unproductive technologies they can implement and operate (Inkaterra, 2014).

The challenges to innovation implementation in SMEs are also compounded when they are located in minor regions as in this study. Peripheral regions are those that are least accessible in relation to the centre of administration or government and are characterized by infrastructure deficiencies, small-scale traditional enterprises and high servicing costs (Mcadam, Reid, Shevlin, Mcadam, & Shevlin, 2014). In peripheral regions innovation infrastructure and market access are more difficult to obtain and tend to become self-reinforcing. Anderson 2001 states that peripheral regions can be undesirable environments for new and small firms. These marginal weaknesses have been reflected in government policy seeking to bridge the gap with more central regions at both regional and firm levels (Rodney, Renee, & Mark, 2014).

The process of innovation in organizations is often difficult to define; therefore, implementation can require high levels of difficulty (Bierly & Daly, 2007). This complication is compounded by the location of the SMEs, which are often family based and where issues arise such as succession, lack of management and technical skills, scarce resources, lack of outside knowledge (inward orientation), doubt towards formal training (Ibrahim et al., 2008; Clark, 2010) and lack of a regional pull factor for
innovation. Research has also consistently shown that most small and medium sized enterprises (SMEs) do not engage in strategic planning (Njoroge, n.d.). As Norman and Thomas (2003) stated that without a clearly defined strategy a business has no basis for creating and maintaining a sustainable competitive edge in the Market Place.

2.4.2 Role of Management in Coping with Challenges

As today’s firms’ face a number of trends such as outsourcing and mass customization, they are forced to find flexible ways to respond to uncertainty and meet customer demand effectively and efficiently. This is especially true of small- and medium-size enterprises (SMEs) which often depend upon the ability to adapt quickly to customer need as a means of survival. Product innovation flexibility (PIF) is more and more recognized as crucial to building a sustainable competitive edge in an increasingly turbulent (Liao et al., 2015)

What is needed is a complex style of leadership – a transformational, facilitative or influencing leader (Slater and Narver, 1995; Fitzgerald and van Eijnatten, 1998). Managers need to set the organization’s direction and create the environment in which staff can operate (Stacey, 1991; Gibson, 1996), and the lower levels can steer (control) the organization in the direction specified by management (Senge, 1990; Gibson, 1996; McGlone and Ramsey, 1998). Managers create the conditions in which individuals, teams and the system are encouraged to respond spontaneously to the changing environment (Fitzgerald & van Eijnatten, 1998), thereby enabling people to be organized and adopt at the same rate with the rapid changes (Baskin, 1998). In other words, control should be local, through self-management, rather than global, by management(Mason, 2007).

Management in a complex and turbulent environment should be organic, with the manager concentrating on creating an internal environment conducive to co-evolution. Decision-making should be decentralized, learning and experimentation facilitated and change encouraged. Management must provide the information and resources to support this approach and control must be exercised through self or group control. This can be called self-organizing management.

2.4.3 Use of Innovative Approaches

SME marketing is restricted by resource limitations, including finance, personnel, and perception of function, skills and attitudes (Carson and Cromie, 1989). However, these limitations serve to stimulate innovation to overcome the associated obstacles, thus
resulting in some kind of innovative marketing. Innovative marketing in SMEs has been variously defined focusing on terms such as newness and opportunity, “creative, novel or unusual solutions to problems and needs” including the “development of new products and services, and new processes for performing organizational functions” (Dwyer et al., 2009).

Strategic collaborations are very important for technological development because small firms cannot develop technologies on their own due to high costs, uncertainties, and risks involved in the process. As a result of such challenges, scholars have suggested that collaborative relationships and networks play an important role in the strategy and performance of SMEs. Alliance help SMEs improve their capability to outmatch a stronger competitor, help facilitate entry into new markets, and provide access to external resources (BarNir and Smith 2002). Merrifield (2007) is even more forceful and suggests that collaborations are critical for the survival of SMEs (Gnyawali & Park, 2009).

The increasing globalization of markets and strengthening of global value chains both emphasize the importance of export competitiveness (Harris and Moffatt, 2011). For small- and medium-sized enterprises (SMEs), however, there is a strong positive relationship between exporting and growth and between exporting and innovation activity (Golovko and Valentini, 2011). Indeed, the evidence suggests that SMEs which have prior innovation experience are more likely to export, more likely to export successfully and more likely to generate growth from exporting than non-innovating firms. European SMEs that export grow more than twice as fast as those that do not, while internationally active SMEs are three times more likely to introduce products or services that are new to their sector than those which are entirely domestic in orientation (Love & Roper, 2015).

2.5 Chapter Summary
In summary, Small and medium-sized enterprises (SMEs) are required to compete in globalized and turbulent markets. To survive in such a dynamic environment, companies need to be able to adapt to market changes, satisfy all their stakeholders and excel in all performance dimensions. Understanding the environment has a great importance in times where the changes occur quickly and unpredictably. There have been several researches done on strategic response to turbulent environments in SMEs. The studies have been done both locally and internationally. The next chapter will examine the research methodologies used to conduct this research.
CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction
This chapter covers the research methodology that the researcher used to carry out the study. It covers the type of research design that was adopted by the researcher, the population and sampling design, data collection method used, research procedures used, how collected data was analyzed and the summary.

3.2 Research Design
The study adopted a descriptive research design. A descriptive research design determines and reports the way things are (Mugenda & Mugenda, 2009). A descriptive research design also seeks to obtain information that describes existing phenomena by asking individuals about their perceptions and attitude towards turbulent environments and how they use innovation as a strategy to cope with turbulence.

It was appropriate for this study because the researcher was looking to identify the research variables which are: innovation and technology in SME’S and determine how these strategies were applied to cope with the turbulent environments.

3.3 Population and Sampling Design
3.3.1 Population Design
The target population in statistics is the specific population about which information is desired. The population of the study will comprise of all small and medium sized enterprises. The researcher compiled a list of all the small and medium sized enterprises and the most appropriate small and medium sized enterprise were selected to be the respondent for the study. The researcher made sure that the entire population was considered and well represented. The interview questions were administered to the respondents selected from the population as samples and emphasis was made to make sure that the response rate was adequate large enough to assure reliability of the study.

The target population of this study was 250 Small and Medium Enterprise in Nairobi.(Otieno, 2015) This target was chosen from a previous study that was done on SMEs in Nairobi thus being appropriate to be used as the target. The population comprised of SMEs in various sectors of the economy that operate within the city of Nairobi. The study population encompassed all owners of SMEs, managers or any person involved with the decision making process of SMEs.
Table 3.1 Presents the Population Distribution

<table>
<thead>
<tr>
<th>Type Of SME’S</th>
<th>Target Population</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sole Proprietorship</td>
<td>20</td>
<td>8</td>
</tr>
<tr>
<td>Partnerships</td>
<td>20</td>
<td>8</td>
</tr>
<tr>
<td>Limited Liability Company</td>
<td>174</td>
<td>70</td>
</tr>
<tr>
<td>Ngo</td>
<td>20</td>
<td>8</td>
</tr>
<tr>
<td>Society Based Organizations</td>
<td>16</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>250</td>
<td>100</td>
</tr>
</tbody>
</table>


3.3.2 Sampling Design and Sample Size

3.3.2.1 Sampling Frame

A sampling frame is a comprehensive list of all sampling units, from which a sample can be, selected (Mugenda & Mugenda, 2009). In this study the sampling frame includes 250 SMEs that operate in Nairobi and its environs. The researcher selected a manageable sample of the population targeted for the study from a sample frame (Enablis Kenya, 2015).

3.3.2.2 Sampling Techniques

Sampling techniques provide a range of methods that facilitate to reduce the amount of data needed to collect by considering only data from a sub-group rather than all possible cases or elements. At the time of conducting research, it was impossible, impractical, or too expensive to collect data from all the potential units of analysis includes in the research problem. From the population frame the required number of subjects, respondents, elements, firms were selected in order to make a sample.

Random, Convenience and Judgment sampling was utilized in this study. First, random sampling was used to select the SMEs within the Nairobi are to ensure that all SMEs that have the attributes being investigated have equal chances of being selected. Then convenience sampling was used to select participants these are owners or the decision makers of the SMEs. This ensured that only participants with the characteristics that the researcher required were chosen for the study.
3.3.2.3 Sampling Frame

A sampling frame is a complete list of all the members of the population to be studied (Mugenda & Mugenda, 2009). The study adopted a mathematical formula for the purpose of determining the sample size. Mugenda and Mugenda (2009) have suggested the following mathematical formula for determining sample size.

\[ n = \frac{N}{1 + N \epsilon^2} \]

For this study, \( N = 250 \) and \( \epsilon = 0.05 \). At 95% confidence level, this translated to a sample size of 375 participants out of a target population of 153 as showed in table 3.2.

Table 3.2 Presents the Sampling Frame and Sample Distribution Strata

<table>
<thead>
<tr>
<th>Strata</th>
<th>Population</th>
<th>Proportionate Sample</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sole proprietorship</td>
<td>20</td>
<td>( n = \frac{N}{1 + N \epsilon^2} )</td>
<td>Sole proprietorship</td>
</tr>
<tr>
<td>Partnership</td>
<td>20</td>
<td>( n = \frac{N}{1 + N \epsilon^2} )</td>
<td>Partnership</td>
</tr>
<tr>
<td>Limited company</td>
<td>174</td>
<td>( n = \frac{N}{1 + N \epsilon^2} )</td>
<td>Limited company</td>
</tr>
<tr>
<td>NGO</td>
<td>20</td>
<td>( n = \frac{N}{1 + N \epsilon^2} )</td>
<td>NGO</td>
</tr>
<tr>
<td>Society</td>
<td>16</td>
<td>( n = \frac{N}{1 + N \epsilon^2} )</td>
<td>Society</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>250</strong></td>
<td><strong>Proportionate Sample</strong></td>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

This comprised of SMEs in the areas of finance, retail, manufacturing, hospitality, Information technology and education. The researcher chose this sample size of 153 SMEs in order to effectively manage the responses due to time and resource constraints and also to ensure a critical analysis of the phenomenon under study.

3.4 Data Collection Methods

The researcher used questionnaires as the instrument for primary data collection. The questionnaire had structured questions. The close-ended questions provided more structured responses to facilitate tangible recommendations. The closed ended questions were used to test the rating of various attributes and this helped in reducing the number of related responses in order to obtain more varied responses. Questionnaires are useful when large amounts of data are to be collected from a large number of people in a short period of time and in a relatively cost-effective way.

Each respondent was provided with a copy of the questionnaire, explained to how the questionnaire was to be filled out and collected. This allowed for sufficient time to fill up the questionnaire without interfering with their work. Their responses formed the basis for the analysis and subsequent discussions.
3.5 Research Procedures
The study used primary data that was collected by use of questionnaires. The questionnaire was a fast way of obtaining data as compared to other instruments. The questionnaires were randomly administered to the respondents from the sample population. This helped in refining the questions through rephrasing and removal of ambiguous questions. It also helped to remove typographical errors. The pilot testing process was used to determine if questions asked are relevant and appropriate.

The questionnaires were administered to the participants door to door. Confidentiality and privacy of the respondents was maintained as the questionnaire did not require them to divulge any personal information that would be used to identify them. The participants were made aware of the purpose of the research and the benefits of the research to their companies. Information provided by the respondents was used for the purpose of this research and the respondents were informed of this fact. To ensure that a high response rate was reached, the researcher followed up with the respondents.

3.6 Data Analysis Methods
Based on the structure of the questionnaire quantitative data was generated. The data was checked, cleaned and tabulated for completeness and consistency. In this study, the collected data was analyzed by use of statistical package (Statistical Package for Social Sciences (SPSS) version 20) for analysis. Both Descriptive statistics and inferential statistics were used to analyze quantitative data. In descriptive statistics, the study used mean, standard deviation and percentages. The analyzed information was then presented in tables and figures.

3.7 Chapter Summary
In summary, this chapter sought to identify the research design, data collection method as well as data analysis method. The research design to be used was descriptive research design. The data was collected using a questionnaire which will target SMEs in Nairobi area. This chapter also looked at the data analysis method where, Statistical Package for Social Sciences (SPSS) program was used for analysis to develop a quantitative inference to the subjects of study. The next chapter presents the results and findings obtained.
CHAPTER FOUR

4.0 RESULTS AND FINDINGS
This chapter presents the results obtained from the data analysis undertaken by the researcher. This incorporates all results relating to the demography of the population as well as results from the specific research objectives aimed at establishing how small and medium enterprises use technology as strategic tools in operating in turbulent environments.

4.1.1 Response Rate
The research issued a total of 153 questionnaires and a total of 140 were filled and returned giving a response rate of 92%. This was sufficient for the study as indicated in Table 4.1

Table 4.1: Response Rate

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filled and returned</td>
<td>140</td>
<td>92</td>
</tr>
<tr>
<td>Non-response</td>
<td>13</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>153</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source; Excel 2017

4.2 Demographical Factors
The research did a data analysis about the demographic features and the results were presented as discussed below.

4.2.1 Gender
An analysis of the respondent’s gender revealed that male respondents were the majority accounting for 75%, while the female population was 65%. This implies that there are more of male entrepreneurs running businesses in the informal sector compared to the female.

Figure 4.1 presents the population in a chart form showing the difference on both genders when it comes to ownership of the various businesses.
4.2.2 Nature of Business
To establish the nature of the business the respondents managed, the findings revealed that majority of the businesses were partnership accounting for 42%, while sole proprietorship were 32% and limited liability accounted for 19% with society based organisations being the least at 6% as shown in table 4.2

Table 4.2: Nature of Business

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sole Proprietorship</td>
<td>45</td>
<td>32</td>
</tr>
<tr>
<td>Partnership</td>
<td>59</td>
<td>42</td>
</tr>
<tr>
<td>Limited liability</td>
<td>27</td>
<td>19</td>
</tr>
<tr>
<td>Society Based Organization</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>140</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>


4.2.3 Duration of Being in Business
To establish the duration of being in business the findings revealed that majority of the businesses have operated for 6-10 years accounting for 37%, while those that have operated for 11-15 years was 29%, while those of 0-5 years was 21% and those over 16years was 16% as shown in figure 4.2
The implication was that firms in the manufacturing sector were the most and accounted for 51%, those in the ICT were 25% while those in Banking and Financial Service were 13%. Those in education were 6%, and in the hospitality, were 4%. SMEs in the Medical field accounted for 1% as shown in figure 4.3.

Figure 4.3: Industry of operation

4.3 Business Owner’s Experiences with Turbulence in the SME’s Sector
The first objective set to establish how business owner’s experiences with turbulence in the SME’s sector. Respondents were asked a set of questions to which they were to respond by either (1= Not at all. 2= Less Extent. 3= Moderate Extent. 4 = Great Extent & 5=Very Great Extent). The results are outlined in the subsequent sections.
4.3.1 Descriptive of Business Owner’s Experiences with Turbulence in the SME’s Sector

The study established that social and technology factors had the most effect on competition in the SMEs (3.93), it was also noted that availability of credit and credit rating had a huge influence on performance (3.83). It was also noted that Quality/changes in competitors has resulted in loss of market share (3.69) and supplier relationships had also influenced quality (3.57). To some moderate extent competitive position e.g. market share, location, product has reduced our sales (3.52). The least extent was on the variable ecological changes have increasingly becoming more complex and sophisticated (3.16) as indicated in table 4.3

Table 4.3: Descriptive of Business Owner’s Experiences with Turbulence

<table>
<thead>
<tr>
<th>STATEMENT</th>
<th>1 (%)</th>
<th>2 (%)</th>
<th>3 (%)</th>
<th>4 (%)</th>
<th>5 (%)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social and technology factors have resulted in increased competition in</td>
<td>4</td>
<td>11</td>
<td>19</td>
<td>20</td>
<td>46</td>
<td>3.93</td>
</tr>
<tr>
<td>the SMEs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Availability of credit and credit rating have influenced our performance</td>
<td>4</td>
<td>9</td>
<td>12</td>
<td>30</td>
<td>45</td>
<td>3.83</td>
</tr>
<tr>
<td>Supplier relationships has influenced our quality</td>
<td>3</td>
<td>14</td>
<td>21</td>
<td>24</td>
<td>38</td>
<td>3.76</td>
</tr>
<tr>
<td>Politics has Legal changes influence performance of SMEs</td>
<td>10</td>
<td>15</td>
<td>18</td>
<td>22</td>
<td>35</td>
<td>3.57</td>
</tr>
<tr>
<td>Quality/changes in competitors has resulted in loss of market share</td>
<td>6</td>
<td>15</td>
<td>18</td>
<td>26</td>
<td>35</td>
<td>3.69</td>
</tr>
<tr>
<td>Competitive position e.g. market share, location, product has reduced</td>
<td>15</td>
<td>8</td>
<td>19</td>
<td>28</td>
<td>30</td>
<td>3.52</td>
</tr>
<tr>
<td>our sales</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ecological changes have increasingly becoming more complex and</td>
<td>22</td>
<td>17</td>
<td>10</td>
<td>25</td>
<td>26</td>
<td>3.16</td>
</tr>
<tr>
<td>sophisticated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic factors have an effect on the business environment among SMEs.</td>
<td>5</td>
<td>12</td>
<td>26</td>
<td>32</td>
<td>25</td>
<td>3.58</td>
</tr>
</tbody>
</table>

Source: SPSS version 20

4.4 Use of Innovation and Technology to Cope with Turbulent Environments

The second objective set to establish how SMEs use innovation and technology to cope with Turbulent Environments in the sector. Respondents were asked a set of questions to which they were to respond by either (1= Not at all. 2= Less Extent. 3= Moderate Extent. 4 = Great Extent & 5=Very Great Extent)
4.4.1 Descriptive on Use of Innovation and Technology to Cope with Turbulent Environment

The finding revealed that adopting latest technology to some very great extent was vital to maintain competition (4.04). It was also noted that innovation in terms of technology, products and services is important to boost sales (3.87). It was also noted that innovation has improved customer care services (3.67). It was also noted that use of innovation is vital so as to diversify into other business (3.61). The least means were for whether innovation has improved Marketing and advertising of products and services offered (3.30) and if SMEs have experienced increased quality of goods and services as a result of innovation (3.28) as shown in table 4.4

Table 4.4: Descriptive on Use of Innovation and Technology to Cope with Turbulent Environment

<table>
<thead>
<tr>
<th>STATEMENT</th>
<th>1 (%)</th>
<th>2 (%)</th>
<th>3 (%)</th>
<th>4 (%)</th>
<th>5 (%)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investing in research and development is necessary to meet needs of the customers</td>
<td>15</td>
<td>10</td>
<td>15</td>
<td>22</td>
<td>38</td>
<td>3.58</td>
</tr>
<tr>
<td>Innovation in terms of technology, products and services is important to boost sales</td>
<td>5</td>
<td>11</td>
<td>16</td>
<td>28</td>
<td>40</td>
<td>3.87</td>
</tr>
<tr>
<td>Adopting latest technology is vital to maintain competition</td>
<td>4</td>
<td>8</td>
<td>14</td>
<td>28</td>
<td>46</td>
<td>4.04</td>
</tr>
<tr>
<td>Use of innovation is vital so as to diversify into other business</td>
<td>11</td>
<td>12</td>
<td>17</td>
<td>25</td>
<td>35</td>
<td>3.61</td>
</tr>
<tr>
<td>Innovation has improved Marketing and advertising of products and services offered</td>
<td>25</td>
<td>6</td>
<td>12</td>
<td>27</td>
<td>30</td>
<td>3.30</td>
</tr>
<tr>
<td>We have experienced increased quality of goods and services as a result of innovation</td>
<td>28</td>
<td>7</td>
<td>9</td>
<td>21</td>
<td>35</td>
<td>3.28</td>
</tr>
<tr>
<td>Low cost pricing of products and services has been attributed to innovation</td>
<td>17</td>
<td>9</td>
<td>13</td>
<td>24</td>
<td>37</td>
<td>3.45</td>
</tr>
<tr>
<td>Innovation has improved customer care services</td>
<td>12</td>
<td>5</td>
<td>9</td>
<td>30</td>
<td>44</td>
<td>3.67</td>
</tr>
</tbody>
</table>

Source: SPSS version 20

4.5 Challenges and Solutions Experienced in Implementing Innovation and Technology

The third objective set to establish challenges and solutions experienced in implementing innovation and technology to cope with turbulent environments in the sector.
Respondents were asked a set of questions to which they were to respond by either (1= Not at all. 2= Less Extent. 3= Moderate Extent. 4 = Great Extent & 5=Very Great Extent)

4.5.1 Descriptive on Challenges and Solutions in Implementing Innovation and Technology

The findings revealed that to a very great extent management capability determines the effectiveness of innovation and technology applied (4.05), it was also established that access to funding has limited the uptake of innovation (3.92). It was also noted that lack of strategic planning to some moderate extent caused poor innovation uptake (3.86). It was also noted that out of the variables examined the increasing globalization of markets and strengthening of global value chains had little effect on facilitating export competitiveness (3.27). Similarly, weak contract enforcement has the least impact on competitiveness (3.08) as shown in table 4.5.

Table 4.5: Descriptive on Challenges and Solutions in Implementing Innovation and Technology

<table>
<thead>
<tr>
<th>STATEMENT</th>
<th>1 (%)</th>
<th>2 (%)</th>
<th>3 (%)</th>
<th>4 (%)</th>
<th>5 (%)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to funding has limited the uptake of innovation</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>28</td>
<td>42</td>
<td>3.92</td>
</tr>
<tr>
<td>weak contract enforcement has hampered our competitiveness</td>
<td>22</td>
<td>14</td>
<td>24</td>
<td>21</td>
<td>19</td>
<td>3.08</td>
</tr>
<tr>
<td>Management capability determines the effectiveness of innovation and technology applied</td>
<td>2</td>
<td>9</td>
<td>12</td>
<td>36</td>
<td>41</td>
<td>4.05</td>
</tr>
<tr>
<td>Lack of strategic planning is the main cause of poor innovation uptake</td>
<td>1</td>
<td>10</td>
<td>26</td>
<td>28</td>
<td>35</td>
<td>3.86</td>
</tr>
<tr>
<td>We need the necessary technological knowledge to implement innovation and technology</td>
<td>4</td>
<td>15</td>
<td>12</td>
<td>39</td>
<td>30</td>
<td>3.76</td>
</tr>
<tr>
<td>We depend upon the ability to adapt quickly to customer need as a means of survival.</td>
<td>4</td>
<td>12</td>
<td>20</td>
<td>31</td>
<td>33</td>
<td>3.77</td>
</tr>
<tr>
<td>Strategic collaborations are very important for technological development</td>
<td>8</td>
<td>9</td>
<td>13</td>
<td>39</td>
<td>31</td>
<td>3.76</td>
</tr>
<tr>
<td>The increasing globalization of markets and strengthening of global value chains has facilitated export competitiveness</td>
<td>21</td>
<td>11</td>
<td>17</td>
<td>22</td>
<td>29</td>
<td>3.27</td>
</tr>
</tbody>
</table>

Source: SPSS version 20
4.6 Innovation and Technology and Performance

The study also sought to establish use of innovation and technology in turbulent environment in the sector. Respondents were asked a set of questions to which they were to respond by either (1= Not at all. 2= Less Extent. 3= Moderate Extent. 4 = Great Extent & 5=Very Great Extent)

4.6.1 Descriptive on Use of Innovation and Technology and Performance

The findings revealed that most of the respondents affirmed that the financial performance of their business was superior to competitors (4.05). They also noted that the level of customer satisfaction in the business was a high one (3.79). It was also noted that innovation and adoption of new technologies have resulted in a diversified service and product range at the business (3.60). The least mean was on whether the products and services offered were superior to those of competitors (3.41) as shown in table 4.6

<table>
<thead>
<tr>
<th>STATEMENT</th>
<th>1 (%)</th>
<th>2 (%)</th>
<th>3 (%)</th>
<th>4 (%)</th>
<th>5 (%)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>The financial performance of your business is superior to competitors</td>
<td>2</td>
<td>5</td>
<td>21</td>
<td>30</td>
<td>42</td>
<td>4.05</td>
</tr>
<tr>
<td>Technological advances have improved efficiency and financial performance of your organization</td>
<td>6</td>
<td>15</td>
<td>22</td>
<td>26</td>
<td>31</td>
<td>3.51</td>
</tr>
<tr>
<td>Innovation and adoption of new technologies have resulted in a diversified service and product range at your business</td>
<td>11</td>
<td>9</td>
<td>24</td>
<td>21</td>
<td>35</td>
<td>3.60</td>
</tr>
<tr>
<td>The products and services you offer are superior to those of our competitors</td>
<td>15</td>
<td>8</td>
<td>24</td>
<td>28</td>
<td>25</td>
<td>3.41</td>
</tr>
<tr>
<td>The level of customer satisfaction in your business is high</td>
<td>1</td>
<td>12</td>
<td>24</td>
<td>33</td>
<td>30</td>
<td>3.79</td>
</tr>
</tbody>
</table>

Source: SPSS version 20

4.7 Inferential statistics

Inferential statistics will be presented below.

4.7.1 Test for Validity

A Cronbach reliability test was done on the variables. Cronbach’s alpha measure assesses the reliability or internal uniformity, of a set trial items. The desired Cronbach Alpha
value should be above 0.6 (α >0.6) For the study the value all the values were above 0.6 hence making the variables very reliable as indicated in table 4.7

Table 4.7: Reliability Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cronbach's Alpha</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business owner’s experiences with turbulence in the SME’s sector</td>
<td>0.991</td>
<td>8</td>
</tr>
<tr>
<td>innovation and technology used to cope with the turbulent environments</td>
<td>0.874</td>
<td>8</td>
</tr>
<tr>
<td>Challenges experience when implementing innovation and technology</td>
<td>0.756</td>
<td>8</td>
</tr>
<tr>
<td>Use of Innovation and Technology and Performance</td>
<td>0.985</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: SPSS version 20

4.7.2 Correlation Analysis

A Pearson correlation was done to establish the relationship between performance, innovation and technology in turbulent environment and business owners’ experience. The study established a significant and positive correlation between performance and innovation and technology in turbulent environment (r=0.987, p<0.01). Also between performance and business owners experience (r=0.992, p<0.01) as indicated in table 4.8. This implies that with every increase in innovation and technology in turbulent environment and business owners experience performance of SMEs increase.

Table 4.8: Correlation analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Performance</th>
<th>Innovation and Technology in Turbulent Environment</th>
<th>Business Owners Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
<td>1</td>
<td>.987**</td>
<td>.992**</td>
</tr>
<tr>
<td>Innovation and Technology in Turbulent Environment</td>
<td>.987**</td>
<td>.000</td>
<td>.995**</td>
</tr>
<tr>
<td>Business Owners Experience</td>
<td>.000</td>
<td>.995**</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: SPSS version 20
4.8 Chapter Summary
This chapter has highlighted the results and findings attained. The first section provided an analysis of demography of the respondents, the second section dealt with data on business owner’s experiences, the third section looked at the data on use of innovation and technology to cope with turbulent environments, and the fourth section covered issues of challenges and solutions experienced in implementing innovation and technology. In chapter five these results will be discussed and relevant conclusions and recommendations made with regard to innovation and use of technology on small and medium enterprises operating in turbulent environments.
CHAPTER FIVE

5.0 DISCUSSION CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter seeks to analyze findings of this study. This is done by comparing and contrasting with previous studies done. Furthermore, the section also discusses conclusion and recommendations based on the findings achieved. The chapter also provides recommendations for further studies.

5.2 Summary of Findings

The purpose of this study was to strengthen the findings by referring to the influence innovation and use of technology as strategies have on small and medium enterprises operating in turbulent environments. This study was guided by the following research questions: What major challenges and solutions do SME owners experience when it comes to implementing innovation and technology as a strategy to stay competitive? How is innovation and technology used to cope with the turbulent environments? What are the business owner’s experiences with turbulence in the S.M.E’s sector?

A descriptive research was adopted because it was appropriate for this study. Moreover, the researcher was also looking to identify the research variables which are: innovation and technology in SME’S and determine how these strategies were applied to cope with the turbulent environments. The target population of this study was 250 Small and Medium Enterprise in Nairobi. Out of the 153 questionnaires distributed, a total of 60 were filled and returned giving a response rate of 91% as illustrated in Table 4.1.

Random, Convenience and Judgment sampling was utilized in this study. Random sampling was used to select SMEs within Nairobi hence, ensuring that all SMEs that have the attributes being investigated have equal chances of being selected. Convenience sampling was used to select participants these are owners or the decision makers of the SMEs. This ensured that only participants with the characteristics that the researcher required were chosen for the study.

The first objective was set to establish how business owner’s experiences with turbulence in the SME’s sector. Findings revealed that social and technology factors had the most effect on competition in the SMEs, availability of credit and credit rating had a huge influence on performance, politics has influence performance, quality/changes in
competitors has resulted in loss of market share and supplier relationships had also influenced quality, competitive position e.g. market share, location, product has reduced our sales. Whereas respondents agreed that ecological changes have increasingly becoming more complex and sophisticated had the least impact as described in Table 4.3.

The second objective was set to establish how SMEs use innovation and technology to cope with Turbulent Environments in the sector. As illustrated in Table 4.4 respondents agreed that to a great extent adopting latest technology to some very great extent was vital to maintain competition. It was revealed that innovation in terms of technology, products and services is important to boost sales, innovation has improved customer care services, use of innovation is vital so as to diversify into other business, innovation has improved marketing and advertising of products and services offered and if SMEs have experienced increased quality of goods and services as a result of innovation.

The third objective set to establish challenges and solutions experienced in implementing innovation and technology to cope with turbulent environments in the sector. Findings in Table 4.5 revealed that to a very great extent management capability determines the effectiveness of innovation and technology applied, access to funding has limited the uptake of innovation, lack of strategic planning to some moderate extent caused poor innovation uptake. However, out of the variables examined increasing globalization of markets and strengthening of global value chains had little effect on facilitating export competitiveness. Similarly, weak contract enforcement has the least impact on competitiveness.

The study undertook a correlation analysis to establish the relationship between performance, innovation and technology in turbulent environment and business owner’s experience. The study established a significant and positive correlation between performance and innovation and technology in turbulent environment and also between performance and business owner’s experience.

5.3 Discussion
This section introduces an in depth discussion of the chapter four’s findings in relation to the objectives of this research.

5.3.1 Business Owner’s Experiences with Turbulence in the SME’s Sector
The findings revealed that social and technology factors had the most effect on competition in the SMEs. Technology is a key factor that influences competitive
advantage (Raisinghani, 2000). Technological turbulence does have an impact on strategy formulation. Certainly, companies need information to make strategic decisions, and keeping up with technological developments is very important for competitiveness in many industries (SubbaNarasimha et al., 2003). Zaidi and Othman (2013), argued that continuous change of technology is affecting the firm’s competitiveness. It’s therefore imperative to consider the technology as the primary influencing economic growth (Khalil, 2000), since the competitive environment is characterized by rapidly changing and unpredictable technology (Chen & Lee, 2009).

Findings also revealed that it was also noted that availability of credit and credit rating had a huge influence on performance. According to Oketch (2000), in his study on identified that lack of credit rating is one of the factors affecting SMEs performance.

Findings revealed that politics has influence performance and economic factors have an effect on the business environment among SMEs. Stigter (2002) states that SMEs faces changes in their business environment which hence affecting performance. These changes are caused by political, demographic, economic, legal, technological, infrastructure, ecology and social forces. Mark and Nwaiwu (2015) states that political factors pose direct risks to small and medium scale enterprises. In addition, regulatory changes imposed by the government promote or inhibit market competition hence affecting performance.

Findings revealed that quality/changes in competitors have resulted in loss of market share and Competitive position e.g. market share, location, product has reduced our sales. Ogutu and Samuel (2011) in their study on strategies adopted by multinational corporations to cope with competition in Kenya revealed that multi-national corporations in Kenya have adopted a number of strategies which include better quality, excellent customer service, innovation, differentiation, diversification, cost cutting measures, strategic alliances, joint venture, mergers/acquisition, and lower prices, to achieve a competitive advantage hence gaining market share. Abishua (2010) asserts that due to increase in competition in Kenyan banking industry. Banks have been forced to change their strategies in order to maintain and enlarge their market shares. In addition, according to Sidorowicz (2007) increase in competition has also made firms seek profitable ways to differentiate themselves from competitors. Rahman et al (2015) in their study on a competitive analysis of airline industry in Biman Bangladesh Airlines findings revealed that competition within the airline industry was very intense. This was because of
availability of many service providers flying on the same routes and targeting same passengers. It was recommended that in order to stay competitive manager’s needs to consider the objectives of rivals and strategize on how to position their organizational strategies.

Study also revealed that supplier relationships have influenced our quality. Prahinski and Benton (2004) in their study on supplier evaluations by looking at communication strategies to improve supplier performance. The study revealed that use of supplier evaluations can help an organization improve their competitiveness in the market place. In addition, organization needs to make it buying expectations known to the supplier in advance hence ensuring quality and timely supply (World Bank, 2013). According to a study done by Chen (2015) on sustainability and company performance in manufacturing industry findings revealed that there was a positive correlation between environmental and social improvement practices suppliers’ management. It was further established that better cooperation with suppliers on environmental work helps in strengthen organizational green capabilities (World Bank, 2013)

5.3.2 Use of Innovation and Technology to Cope with Turbulent Environments

The finding revealed that respondents agreed that adopting latest technology was vital to maintain competition and innovation in terms of technology, products and services is important to boost sales. Creative technological adaptations enable an organization develop new products or improve existing products hence achieving a competitive (Pearce & Robinson, 2007). Product innovation is the process of adapting to changes taking place in the market, technologies, and competition. Through innovation organizations are able to improve their sales hence increase in profits (Czekaj et al., 2001).

Fast technological advances significantly shorten the life cycle of existing products, erode the competitive advantage of even well-entrenched firms, and propel other firms to the forefront (Tushman and Anderson, 1986). Firms must enhance their innovation strength and seize the opportunities that new technologies create to advance next-generation products; otherwise, they will be squeezed from the market (Li and Calantone, 1998).

According to Sulaimani (2012), organizations need to enhance their understanding on the importance of use of technology hence being able to achieve a competitive advantage through cutting cost, improving quality and boosting productivity. Product innovation
refers to the improvements made on the mix of products of the company that is, the choice of new products and their development. In addition, product innovation is often made in technology driven companies and helps companies in their competitive positioning while retains market presence, not only in radically changed products but also in differentiating the offerings.

The finding revealed that respondents agreed that innovation has improved customer care services and innovation is vital so as to diversify into other business. According to Mikael et al (2015) intense competition which is characterized by severe price wars, heavy advertising, diverse product alternatives and added services makes two options especially desirable. One is to internalize the competitors’ strength simply through imitation, thereby leading to fewer tech-based innovations. The other is nullifying the competitors’ strength by identifying a new segment and serving new customers who have a different value system, in other words, they can introduce market-based innovations that target a niche market.

Findings revealed that innovation has improved marketing and advertising of products and services offered. According to Rust, et al (2004) market innovation includes product strategy, price strategy and promotion strategy. In addition, through market innovation firms are able to change their marketing strategy (packaging, design, sales, distribution method and advertising). Polder et al (2010), marketing innovation is the process of implementing new marketing methods that involves very significant changes the placement, design, packaging, product promotion and pricing strategy. They further state that the main objective of marketing innovation is to increase the market share, sales and also to open new markets.

5.3.3 Challenges and Solutions Experienced in Implementing Innovation and Technology

Findings revealed that respondents agreed that management capability determines the effectiveness of innovation and technology applied. Chandler et al (2000) orientation and attitude of the owner manager is the key to innovativeness within a small firm. According to Koch (2011), management is defined as the visible hand that guides and co-ordinates the flow of processes within an organization. He states that management lacks the proper patterns set in place to handle innovation and creativity especially in the
telecommunications sector. In addition, management in the telecommunication firms lack the ability to identify viable innovations that can help the organizations to grow.

Factors facilitating or hindering innovation categorized into external and internal. Internal variables include resources such as management capability, expert skills, time, internal funds, but also systems, in particular knowledge systems (Delahaye, 2005), or organizational variables including structures, cultures and norms and leadership (McAdam et al., 2004; Tidd et al., 2001; Keizer et al., 2002; O’Regan et al., 2005)

Findings revealed that access to funding has limited the uptake of innovation. Liao et al (2015) unlike large firms, SMEs with limited financial resources and insufficient managerial infrastructure tend to rely less on costly R&D investment for innovation activities. SMEs also do not have abundant resources available for human capital development, which enables R&D personnel to self-generate new knowledge. According to Zatezalo and Gray (2000), small organizations are more innovative than larger ones, although their implementation of innovations may be slower, due to lack of resources.

Findings revealed that lack of strategic planning to some moderate extent caused poor innovation uptake. Research has also consistently shown that most small and medium sized enterprises (SMEs) do not engage in strategic planning (Njoroge, n.d.). As Norman and Thomas (2003) noted without a clearly defined strategy a business has no sustainable basis for creating and maintaining a competitive edge in the Market Place.

Findings revealed that increasing globalization of markets and strengthening of global value chains had little effect on facilitating export competitiveness. The increasing globalization of markets and strengthening of global value chains both emphasize the importance of export competitiveness (Harris and Moffatt, 2011). For small and medium sized enterprises (SMEs), however, there is a strong positive relationship between exporting and growth and between exporting and innovation activity (Golovko and Valentini, 2011). Indeed, the evidence suggests that SMEs which have prior innovation experience are more likely to export, more likely to export successfully and more likely to generate growth from exporting than non-innovating firms. European SMEs that export grow more than twice as fast as those that do not, while internationally active SMEs are three times more likely to introduce products or services that are new to their sector than those which are entirely domestic in orientation (Love & Roper, 2015).
5.4 Conclusion
The conclusion presented here is on the basis of the research objectives.

5.4.1 Business Owner’s Experiences with Turbulence in the SME’s Sector
Due to turbulent changes that are taking place in the environment, SMEs are experiencing intense competition due to social and technological factors, competition from competitors due to their position in the market, product diversification, and location. However, SMES are able to achieve a competitive advantage by creating a relationship with their suppliers hence being able to get resources of high quality.

5.4.2 Use of Innovation and Technology to Cope with Turbulent Environments
The use of latest technology has played a big role in maintaining a competitive advantage. In addition, innovation strategies also enable SMEs to come up with, customer care, product and service innovation strategies that they can use to become more competitive hence increase their quality of products and services.

5.4.3 Challenges and Solutions Experienced in Implementing Innovation and Technology
Management capability determines the effectiveness of innovation and technology applied. Lack of funds can also hinder the use of innovation strategy hence affecting strategy planning and implementation.

5.5 Recommendation
Key recommendations for SMEs are presented here on the basis of more improvement and further research.

5.5.1 Recommendation for improvement
There are a few recommendations stated below that can be adopted by SMEs.

5.5.1.1 Business Owner’s Experiences with Turbulence in the SME’s Sector
Social, technological, political ecological and economic factors are examples of challenges SMEs face. SMEs should be more aware of ecological changes that are taking place in the environment hence become more competitive and adapt to turbulence environment.

5.5.1.2 Use of Innovation and Technology to Cope with Turbulent Environments
It is recommended that SMEs should become more innovative and develop marketing innovation strategies that will enable them make customer aware of their products hence...
increase in profit. Through product innovation strategies, SMEs will also be able to increase their product and service quality and respond to customers taste and preference.

5.5.1.3 Challenges and Solutions Experienced in Implementing Innovation and Technology

SMEs should ensure that it has sufficient funds and management capabilities to enable them become more innovative and develop use of technology hence, becoming more competitive. SMEs should also facilitate export competitiveness by increasing global market and strengthen global value chains.

5.5.2 Recommendation on areas for further studies

The study recommends that a similar study should be done to identify other factors that affect innovation and use of technology as a strategic tool operating in turbulent environment. Furthermore, this study was based on SMEs only. It therefore recommends that a similar research is done in other organizations to determine whether the factors affecting innovation and use of technology in SMEs are similar to another.
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APPENDIX 1: Data Collection Instrument

Questionnaire

Academic Research Study on innovation and technology as a strategic adaptation towards turbulent environments in SMEs

Case of Nairobi based SMEs.

Dear Sir/Madam,

The purpose of this questionnaire is to collect user views on innovation and technology in SMEs as part of my academic research study for the award of MBA at USIU-Africa. I appreciate your valued time in responding to the questions and assure you of confidentiality and privacy.

Carol Njihia.

Section A: Background information

1) Gender of respondent
   (a) Male [ ]
   (b) Female [ ]

2) Nature of business
   (a) Sole Proprietorship [ ]
   (b) Partnership [ ]
   (c) Limited liability [ ]
   (d) NGO [ ]
   (e) Society Based Organization [ ]
   (f) Others Specify: ............................................

3) How long have you been in business?
   (a) 0-5 yrs [ ]
   (b) 6-10 yrs [ ]
   (c) 11-15 yrs [ ]
(d) Over 16yrs [ ]

4) What industry is your company operating in?

Manufacturing [ ]

ICT [ ]

Banking and Financial Services [ ]

Medical [ ]

Education [ ]

Hospitality [ ]

If Other, Please specify____________

Section B: Business Owner’s Experiences with Turbulence

Kindly tick where appropriate in regard to business owner’s experiences with turbulence by either (1= Not at all. 2= Less Extent. 3= Moderate Extent. 4 = Great Extent & 5=Very Great Extent)

<table>
<thead>
<tr>
<th>STATEMENT</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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</thead>
<tbody>
<tr>
<td>Social and technology factors have resulted in increased competition in the SMEs.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Availability of credit and credit rating have influenced our performance</td>
<td></td>
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<tr>
<td>Supplier relationships has influenced our quality</td>
<td></td>
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<tr>
<td>Politics has Legal changes influence performance of SMEs</td>
<td></td>
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</tr>
<tr>
<td>Quality/changes in competitors has resulted in loss of market share</td>
<td></td>
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</tr>
<tr>
<td>Competitive position e.g. market share, location, product has reduced our sales</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Ecological changes have increasingly becoming more complex and sophisticated</td>
<td></td>
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</tr>
<tr>
<td>Economic factor shave an effect on the business environment among SMEs.</td>
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</tbody>
</table>
Section C: use of innovation and technology to cope with turbulent environments
Kindly tick where appropriate in regard to: use of innovation and technology to cope with turbulent environments by either (1= Not at all. 2= Less Extent. 3= Moderate Extent. 4 = Great Extent & 5=Very Great Extent)

<table>
<thead>
<tr>
<th>STATEMENT</th>
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<th>2</th>
<th>3</th>
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<th>5</th>
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</thead>
<tbody>
<tr>
<td>Investing in research and development is necessary to meet needs of the customers</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Innovation in terms of technology, products and services is important to boost sales</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Adopting latest technology is vital to maintain competition</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Use of innovation is vital so as to diversify into other business</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Innovation has improved Marketing and advertising of products and services offered</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>We have experienced increased quality of goods and services as a result of innovation</td>
<td></td>
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</tr>
<tr>
<td>Low cost pricing of products and services has been attributed to innovation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Innovation has improved customer care services</td>
<td></td>
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</tbody>
</table>

Section D: Challenges and Solutions Experienced in Implementing Innovation and Technology
Kindly tick where appropriate in regard to challenges and solutions experienced in implementing innovation and technology by either (1= Not at all. 2= Less Extent. 3= Moderate Extent. 4 = Great Extent & 5=Very Great Extent)

<table>
<thead>
<tr>
<th>STATEMENT</th>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to funding has limited the uptake of innovation</td>
<td></td>
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<tr>
<td>weak contract enforcement has hampered our competitiveness</td>
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</tr>
<tr>
<td>Management capability determines the effectiveness of innovation and technology applied</td>
<td></td>
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</tr>
<tr>
<td>Lack of strategic planning is the main cause of poor innovation uptake</td>
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<td></td>
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<tr>
<td>We need the necessary technological knowledge to implement</td>
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</tbody>
</table>
We depend upon the ability to adapt quickly to customer need as a means of survival.

Strategic collaborations are very important for technological development

The increasing globalization of markets and strengthening of global value chains has facilitated export competitiveness

**Section E: Innovation and Technology and Performance**

Kindly tick where appropriate in regard to effect Innovation and Technology and Performance by either (1= Not at all. 2= Less Extent. 3= Moderate Extent. 4 = Great Extent & 5=Very Great Extent)

<table>
<thead>
<tr>
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<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>The financial performance of your business is superior to competitors</td>
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<tr>
<td>Technological advances have improved efficiency and financial performance of your organization</td>
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<tr>
<td>Innovation and adoption of new technologies have resulted in a diversified service and product range at your business</td>
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<tr>
<td>The products and services you offer are superior to those of our competitors</td>
<td></td>
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<td></td>
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<tr>
<td>The level of customer satisfaction in your business is high</td>
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## Appendix 2: Timetable

<table>
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<tr>
<th>ACTIVITY</th>
<th>Jan</th>
<th>February</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
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<tbody>
<tr>
<td>Proposal writing</td>
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<tr>
<td>Submission of proposal to</td>
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<tr>
<td>supervisor for approval</td>
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<tr>
<td>Data analysis</td>
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<td>Report writing</td>
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<tr>
<td>Presentation of report</td>
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### Appendix 3: Budget

<table>
<thead>
<tr>
<th>ITEM</th>
<th>NO. OF UNITS</th>
<th>COST PER UNIT</th>
<th>TOTAL COST (KSHS.)</th>
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<tbody>
<tr>
<td><strong>A. STATIONERY</strong></td>
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<tr>
<td>Foolscaps</td>
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<td>Rulers</td>
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<td><strong>Sub Totals</strong></td>
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<td><strong>B. SERVICES</strong></td>
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<tr>
<td>Proposal printing</td>
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<tr>
<td><strong>Sub Totals</strong></td>
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