



## **ROLE OF TECHNOLOGICAL INNOVATION ON THE PERFORMANCE OF SMALL AND MEDIUM ENTERPRISES (SMEs): A SURVEY OF HOTELS IN NAIROBI**

**GIKONYO Stephen Murimi.<sup>1</sup> KITHINJI Moses<sup>2</sup>, NJERU Eric<sup>3</sup>**

<sup>1</sup>MBA Student: Kenya Methodist University

<sup>2</sup>Lecturer: Kenya Methodist University

<sup>3</sup>Lecturer: Kenya Methodist University

**Abstract:** Innovation refers to the development or creation of new processes or devices as a result of experimentation and studies. Quality and innovation can be seen as two key strategies for increasing customer value. In today's uncertain and volatile business environment, firms have to recognize and make use of opportunities for them to survive and compete successfully. Technological innovation involves putting of new ideas into practice through the development of new processes and products, which play a major role in trade and economic development. In developing countries, small and medium enterprises are considered to be drivers of equitable development and economic growth. This is because they are labor intensive and hence are capable of creating the more than one billion jobs required in the world today. The utilization of innovation in restaurants leads to the competitiveness of product portfolio and helps the management in achieving a competitive advantage. The purpose of the study was to investigate the role of technological innovation on the performance of small and medium enterprises (SMES). The main objectives of the study was to assess the link between creativity and performance of the Small and Medium Enterprises; to explore the role of National Innovation system and performance of the Small and Medium Enterprises, to examine the effect of knowledge diffusion exchange through networks and the performance of the Small and Medium Enterprises and to assess the influence of technological capability on the Small and Medium Enterprises' performance. To obtain the sample the researcher used the stratified random sampling. Questionnaire was used as a method of data collection. The data collected was analyzed and presented using various presentation mechanisms including graphs, pie charts and tables. The study found that knowledge diffusion, technological capability, national innovation process and creativity have a significant influence on the hotels' performance in Nairobi County. This study makes a recommendation that the management of hotels in Kenya should ensure that there are consistent and frequent trainings of their employees. Training plays a major role in improving employees' knowledge and skills, which in turn improves performance and productivity. This study recommends that hotels' managements should include orientation of technological innovations during the orientation of new employees. This study further recommends that the government of Kenya should come up with policies geared towards improving the innovation process among SMEs. This study also recommends an all participatory approach during the innovation process.

### **Introduction**

The term innovation has had various definitions. According to AL-Mubarak and Aruna (2013) innovation involves the introduction of something new or newly introduced. Innovation denotes to the development or creation of new processes or products, which results from experimentation or studies. Creation refers to a product whose existence can be attributed to someone. In addition, innovation

encompasses the development of an object, product or service through excogitating, conceptualizing and designing through creative thinking and enhanced creativity. It also refers to the process of inventing of a scheme in an effort of suiting some purpose and inventing answers to answer a problem. In addition, innovation can also refer to an art of starting or doing something for the first time; initiation, origination, introduction, beginning, commencement of founding (Farlex clipart collection, 2003-2012). According to Hornsby (2010) innovation refers to the introduction of something new, new ways of doing something as well as new ideas.

Edvardsson and Tronvoll (2013) indicate that innovation refers to changes in the structure of services, which result for reconfiguration of actors, schemas and resources leading to new practices that are more valuable to the actors making the services more sustainable (Palm et al., 2015). Quality and innovation can be seen as two key strategies for increasing customer value. The two are also deeply interlinked. The relationship between innovation and quality is that innovation is considered to be one of the main ways of going beyond quality improvement approaches of the years between 1980 and 2000 into key steps of change in the general responsiveness, effectiveness and efficiency of service. According to Baregheh et al. (2012), innovation is recognized as one of the main ways of contributing to organizational survival, performance and success. Sernack (2016) also argue that firms that recognize and act on change possibilities and opportunities by use of innovation in today's uncertain and volatile business environment will be in a position to survive, compete successfully, and flourish in the midst of current adverse conditions.

Wehrich et al. (2008) indicate that innovation and creativity are important in a firm's entrepreneurial process. In any organization, the mention of innovation creates a picture of success. However, innovation cannot be considered to be a matter of sheer luck as it calls for well-organized rational and systematic work, managed for results. Innovation comes about because of so many issues that include success, failure or unexpected event; inconsistency between reality and what is expected; tasks or processes that require improvement, demographics' changes; changes in meaning and in perception of this of newly acquired knowledge (Sharma, 2016). Innovation can be explained as the process of developing a solution in the form of a physical product or service that delivers new value to customers. It begins with the identification, selection of customers and markets, including the identification of opportunities and ends once the desired outcome is attained. Organizations exist because of customers and not vice-versa. Therefore, identifying and understanding the needs and wants of customers to enhance their experience should be the focus of any successful organization. Organizations with a better experience in an industry and those that always stay ahead of their competitors always ensure effective and efficient use of innovation. In their study Agarwal et al. (2003) found an optimistic and significant relationship between innovation, market orientation and the superior performance of organizations.

Ruiz (2009) noted that the manufacturing industry in Mexico has been one of the key drivers of innovation and invention. In addition, the sector of information technology in Mexico needs to the exploration of new business opportunities in order to achieve long term profitability by use of innovative strategies for service delivery like information technology infrastructure library, control objectives for information and related technology, and capability maturity model integration, among others. Based on reported trends in manufacturing and information technology output growth beyond the NAFTA countries, the declining growth of the manufacturing sector and a proliferation of high-technology companies in the USA leading the world in information technology, it is foreseeable that the economy of Mexico requires the infrastructural investment development from the government

of Mexico and the fast growing private sector. In addition, Mexico requires heavy investment in educational enterprise so as to enhance a research and discovery atmosphere to support effort by the government and private sectors. As foreign R&D grows beyond the NAFTA region, the pace of innovation will quicken which may further widen the increasing gap. This will spur educational advancement in these countries and possible brain drain from Mexico if local opportunities are not readily available.

In Ghana, Mahmoud and Hinson (2012) in a research of innovation, market orientations well as corporate social responsibility practices indicate that the relationship between performance and market orientation can be more complex than anticipated in firms that rely on some competencies so as to turn the relationship between performance and market orientation into a successful business strategy. According to this study, two of such key competences are CSR and innovation. Findings seem to indicate that even “doing good” requires a sense of innovation for it to trigger any significant financial performance for the business. The findings of the study supported all six hypotheses relating to the research model, thereby, confirming the significance of innovation for both CSR and market orientation strategies. Moreover, the uncovered mediated results provide marketing practitioners with better understanding of the market orientation's pathway to business performance. The methodological limitations encountered whilst completing the study are carefully discussed below.

As indicated by Nzomo (2013) in January 2013, the President of Kenya assented to the Science, Technology and Innovation bill. This policy facilitates the promotion, regulation and coordination of progress in technology, innovation and science in the country. This law was developed in an effort to improve technology and innovation in the national production system (Ndemo, 2015). Over the past 10 years Kenya has made a stunning innovation journey in which the country's youths have played an important role. The first innovation policy in Kenya was developed in the year 2006 in alignment with the Vision 2030 initiative. The policy declared that Kenya would break from the past and start doing things differently. Unemployment is perhaps the country's greatest threat to stability, especially with the recruitment of idle youth into terror groups such as *Al Shabaab*. But, ironically, the need for jobs is precipitating innovation. The Guardian reports on an innovative project called ‘LivelyHoods’ that began in Nairobi's *Kawangware* slum. The project creates employment opportunities by training youths to sell products tailored to the needs of their communities. In response to the desire of the youth to be engaged in innovation, the government of Kenya has made several efforts including funding of Research and Development as well as new policies as a strategy for support innovation and job creation. Although the country is just beginning its innovation journey, other emerging economies can still learn something from Kenya, including the benefits of using deliberate policy interventions; of leadership in government with an appetite for risk taking; of the construction of collaborations and partnerships with the private sector including multinational corporations; of increasing funding research; and of the development of incubation centres across universities to foster innovation. Relative to other African countries, some of Kenya's strengths lie in its current expenditure on education, relatively easy access to credit for individuals, increasing R&D spending, and intensity of local competition (Kenya is a free market economy where competition is encouraged). These variables positively influence innovative capacity. Kenya climbed up the rankings in the Global Innovation Index (GII), rising from 99th position in 2013 to 85th in 2014.

## **Statement of the Problem**

Yu and Peng (2013) indicate that SMEs face extremely high risk of failure. Approximately, 50% of SMEs are collapse within first five years of operation (Khalique, Isa, Shaari & Ageel, 2011). In Kenya Kangethe (2016) indicate that although there is no published risk of SMEs, about 70 per cent of SMEs fail in the first three years of their existence. Eravia et al. (2014) argue that the small and medium enterprises sector is still experiencing challenges related to raw material, limited access to capital, marketing of services and products, high interest rates, exchange rates fluctuations, qualified human resource and limited access to capital (Klewitz et al., 2012). In regard to sustainability, small and medium enterprises are facing challenges such as constraints in resources in terms of knowledge, human capital, time and other factors related to organizational structure and managerial like limited number of personnel committed to the management of sustainability (Hossain & Kauranen, 2016). SMEs do not possess the necessary capacity to search extensively. Deo (2013) report that globalization has led to new challenges that include relate to sustainability and survival of firms. However, SMEs can obtain an organizational solution to help them cope and take advantage of international business opportunities without suffering from limited resources and without being exposed to many risks (AL-Mubarak & Aruna, 2013). The utilization of technological innovations is one aspect firms cannot avoid if they to achieve and maintain a competitive advantage and even get entry to the upcoming new markets. The adoption of technological innovation is important in the growth of firms, mainly in the private sector. The study sought to investigate the role of technological innovation on the performance of Small and Medium Enterprises (SMEs).

The objectives of the study were:

- i. To assess the link between creativity and performance of the Small and Medium Enterprises.
- ii. To explore the role of National Innovation system and performance of the Small and Medium Enterprises.
- iii. To examine the effect of knowledge diffusion exchange through networks and the performance of the Small and Medium Enterprises.
- iv. To assess the influence of technological capability on the performance of Small and Medium Enterprises.

## **Theoretical Review**

The study will be anchored on three theories: the theory of innovation diffusion, actor-network theory and theory of the firm.

### **The Theory of Innovation Diffusion**

Innovation diffusion theory is a technology related theory that tries to describe how, what, and at what rate knowledge or concepts and even technological innovations are spread (Robinson, 2009). The theory gives an explanation of how innovations spread and take place in a community or population. An innovation can be defined as a concept, idea, object of behavior considered to be new by the audience. Innovations' diffusion takes a different approach as compared to other theories of change. Innovation diffusion theory considers change as a key in reinvention or evolution of behaviors and products so as to better address the needs and requirements of groups and individuals (Robinson,

2009). According to Robinson (2009), innovations themselves change and not it is not people who change. Therefore, innovation diffusion outlines the process of where a service, a product or knowledge of their use and utilization moves from the source like a research and development department to a reception point leading into classical process description of processes, commercialization, adoption and even uptake (Teece, 2010). Innovation diffusion is a very important process in ensuring innovations' success. Many times, people make assumptions that new technologies and new inventions used in the improvement of specific situations diffuse themselves because they offer some benefits to the adopters. Technology diffusion is similar to technology innovation that puts emphasis on new knowledge, processes and products development as well as transfer of government oriented technology that most of the times seeks to shift advanced technology out of research and development institutions and laboratories to the outside world for commercial use.

### **Actor-Network Theory**

According to Andrade and Urquhart (2010), Actor network theory focuses on simultaneous and dynamic influence of technical and social, assuming symmetry between non-human actors and human actors. In case a new technology is developed through different innovation stages, the investors must cooperate with potential users and various devices components (Banks, 2011). Tatnall and Gilding (1999) indicate that the components of a network are most of the times changed into devices or inscriptions like models, books, computer programs, reports and documents (Callon, 1986). For its constant and continued existence, a network significantly depends on simplifications' maintenance. Actor network theory attempts to integrate technology into social processes and explains how technology is accepted within a network. ANT focuses on the network building and formation process, and, thus, explores alliances or networks are developed and sustained and how they compete with each other (Xu et al., 2008). The widespread process in technology as well as the increasing technological base develops difficulties in SMEs innovation because technology and knowledge required for innovation may be outside an organization's core competencies. One of the ways that can be used in addressing his problem is the formation of networks among SMEs and other institutions and firms. The use of this strategy can be very effective in increasing of tacit knowledge and in the creation of possibilities for firms to obtain knowledge outside their boundaries.

### **Theory of the firm**

According to theory of the firm, the behavior of specific business entities is normally driven by profit maximization. The theory involves decision making in various areas that include production techniques, quality produced, pricing adjustments and resource allocation (Teece, 2010). The firm is considered a central actor for effectual technological change and innovation (Wu et al, 2012). Technical capability refers to the organizational learning process or technical knowledge acquiring process. It also refers to the ability of an organization to make use of technology in securing and sustaining competitive advantage. Technical capability shows the abilities of an organization in utilizing various technical resources and in executing technical functions that involve, improving, operating as well as modernizing the productive facilities of the firm. The capability of an organization to come up with innovations relies on the technical and scientific capabilities and technical management capability (Teece, 2010). The industrial laboratories used in the last few centuries have paved way for organization and geographical diffusion of technology and hence putting more emphasis on the managers' coordination skills (Wu et al, 2012). Thus, the development of technological

competence and capabilities is an important factor in a firms' technological innovation, particularly in the manufacturing sector in nations that in the industrialization catch-up phase (Teece, 2010). In an organization, dynamic capabilities include decision rules, procedures, organizational structures and procedures that an organization can use in the creation and capturing of value (Wu et al, 2012). As such, technology capability involves organizational, technical and managerial skills that firms require in their efficient utilization of the software (information) and hardware (equipment) of technology in the accomplishment of technological change process. In any firm, technological capability is considered a valuable, non-substitutable and inimitable asset since it is entrenched in the routines of an organization (Saunila, 2016). An organizations capacity to innovate is one of the key drivers of the success of a firm. In addition, innovation capability is one of the most key dynamics in enabling small and medium enterprises in achieving a high degree of competitiveness in the international market and in the local market. Therefore, development and sustenance of improved innovation capability should be one of the priorities of top managers in small and medium enterprises.

### **Empirical Review**

Previous studies show that technological innovation is significantly associated with SMEs' performance. In addition, innovation is considered to have considerably contributed to the performance, survival and success of organizations.

### **Knowledge Diffusion**

Since small and medium enterprises (SMEs) generally lack the resources of larger firms, it is crucial that they formulate knowledge management (KM) activities (Lin, 2014). KM activities involve the creation, capturing, sharing, and utilization of knowledge to enhance the impact of knowledge on the performance of SMEs. To facilitate the participation of SMEs in knowledge-intensive activities, SMEs will be encouraged to create market value through knowledge exploitation in novel circumstances via effective management of a highly qualified workforce. Knowledge management outlines the continuous firm knowledge-based assets' reconfiguration and adjusts to the changing conditions in the market to as to achieve innovativeness and organizational renewal. Therefore, the diffusion of knowledge management is significant as business environmental changes like KM strategy diversification, limited useful life of knowledge, increased globalized competition as well as the dynamics of services and product innovations. The need for small and medium in the facilitation of knowledge management diffusion comes from different salient reasons. Whereas, small and medium enterprises may be limited by human and financial resources, their knowledge and know-how are the most important resources they may use.

Promoting KM diffusion thus is particularly crucial in SMEs, as knowledge is the most important resource in such organizations. Additionally, compared to large enterprises, SMEs generally have flat and flexible organizational structures, elastic and adaptable processes, and strong innovation potential. These characteristics endow SMEs with organizational flexibility and adaptability that is critical to successful KM diffusion. Finally, increasing competitive pressure forces SMEs to rethink their existing competitive strategies. Indeed, knowledge and its management are considered the most valuable sources of growth and competitiveness. Scholars have emphasized that the advantages of KM to SMEs mostly related to cost reduction, improved decision making, and increased productivity, market share, innovation, and profitability. Consequently, it is worth examining key enablers for the stage-based

KM diffusion in SMEs. In the study by Lin (2014) the empirical evidence also obtains several key findings and implications about the determinants of KM diffusion stages in SMEs.

### **Technological capability**

The ability of an organization to develop new processes and products in a shorter lead-time has in the recent past become an important competitive tool (Liu & Jiang, 2016). Technological capabilities refer to skills and knowledge required in the identification, appraisal, and creation of appropriate techniques and technologies relevant to traditional industries with an aim of improving production processes and production facilities (Karagouni et al., 2013). In addition, technological innovation also refers to the organizational adaptations and engineering necessary in the establishment of innovativeness and continuous upgrading of product and process technologies. They comprise of research and development activities and help in the carrying out of more general technological activities including basic research (Karagouni, et al., 2013).

Policy makers need to identify the bottleneck of enterprise's technological innovation in order to properly distribute the national R&D fund (Wu, et al., 2014). In the service industry, technological capability is perceived to be the capability of the organizations to make effective use of service knowledge in the creation and transfer of services (Karagouni et al., 2013). Technological capabilities are often built through interactions between firms and between external forces and firms. Lall's matrix categorizes technological capabilities in terms of functions in the facilitation of specific productive activities. Particularly, all the three dimensions used in Lall's matrix are related to production technologies. The first dimension is investment (project execution and pre-investment) encompasses product design, as well as technology process and search. The second dimension is production and encompasses product, industrial engineering and process. The third component is linkage to the economy, which is translated as an organization's capability to receive skills, technologies and information.

### **National Innovation System**

Wang and Zhou (2011) propose that innovation processes are becoming systemic and socially embedded, as a result, the coordination mechanisms towards interacting and interconnecting elements need to be innovated beyond the market mechanism. However, non-market mechanisms, including institutional mechanism, networks and policy mechanisms are significantly more complex than market-mechanism. Various systems have different performances when developing and operating the national systems of innovation. The diversity of performances provides the possibility to compare the different efficiencies and effectiveness in different systems. Researchers label this kind of research as aiming at assessing the effectiveness, setting benchmarks and identifying the factors that foster or hamper the development and operation of national systems of innovation as effective method or the system failure analysis. This analytical method presents a greater potential for plotting the system failures where public supports are required. National systems of innovation are "the network of institutions in the public and private sectors whose activities and interactions imitate, import, modify and diffuse new technologies" and draws a distinction between a narrow and a wide definition of national systems of innovation and consider national innovation systems as institutions' arrays whose interactions determine the performance of innovation.

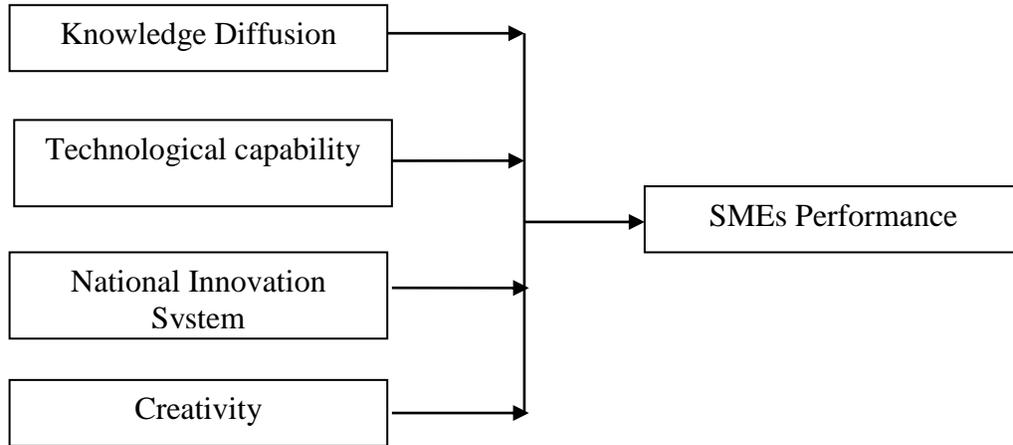
The requirement that small and medium enterprises should be accountable for their actions can be effectively achieved through the maintaining of efficient record management systems that help in future making of decisions (Klewitz et al., 2012). Sustainability-related components' integration and innovation can be beneficial for business: they can reduce costs (by developing an energy management system), reduce risks, increase sales volume and profit margins (by introducing of premium organic brands), increase reputation and brand value, become more attractive as an employer (by ensuring better alignment between company values and personal values), and build up innovation capabilities.

## **Creativity**

Knowledge creation and adaptation to alteration are the key motivations that bring about cultivating creativity (Mihai-Yiannaki & Sayyides, 2012). According to Interactionist perspective brought about by Giustiniano et al. (2016) creativity may be viewed as the formation of a useful new product, valuable, service, idea, procedure, or process through persons working together in a social system which is complex. Highsmith (2004) described agility as the skill of both creating and responding to change... the capacity to balance flexibility and stability. Heinonen et al. (2011) denotes that entrepreneurship entails business ability and knowledge and not only creative and innovative thinking (the art). Creativity is an aspect that has in the past not been deliberated in the intention-based models. However, creativity has been related with entrepreneurship and innovative behavior for so long but the current literature proposes that individuals who are creative are more likely to be involved in entrepreneurial behaviour (Hamidi et al., 2008). Synonymously, entrepreneurship and innovation business behavior can both be described using the long tradition as a doing of creativity.

This agility entails individuals who are nimble and creative improvisers who can handle uncertainty – the skill to reason independently from the box and work within it (Highsmith, 2004). Giustiniano et al. (2016) asserts that in determining creativity, it is important to observe various features such as the creative product, creative process creative individual and the creative situation (Heinonen et al., 2011). In creating new business ideas and developing business opportunities, the ability (denoting to new ways of thinking and behaving) is reflected to be very helpful in the search for business opportunities. Creativity nonetheless reinforces the strategies used in searching for the creative opportunities and the strategies used in the search are based on knowledge acquisition. For a positive impact on the practicality of the business idea, the impact of creativity on the business idea is completely resolved by the strategies used in search of the opportunity that are creative and knowledge acquisition based. Creativity is linked to a person search of a distinctive and novel idea and the many different proposal ideas, which is a rational and maybe a self-evident demonstration of creativity the search for opportunities. Interestingly, though, creativity is also associated to the analytical behavior founded on acquisition of knowledge – the gathering of information on industries, markets and systematic work on the business idea. Information and knowledge supports the process of creation of a business idea ad these incorporates both sides; based on knowledge acquisition and creative behavior.

### Conceptual Framework



**Independent Variable**

**Dependent Variable**

**Figure 1: Conceptual Framework**

### Research Methodology

This study used descriptive research design, specifically making use of questionnaires to determine the role of technological innovation on the performance of Small and Medium Enterprises (SMEs) more so in hotels. According to the Department of Research and Information (2012) Kenya has about 265 hotels that range from 1 to 5 stars. In Nairobi County, there are 65 hotels, Mombasa has 27 hotels and Kisumu has 12 hotels while the others are in other hotels in Kenya. The Tourism Act of 2011 and the Tourism Regulatory Authority Regulations, (2014) schedules Nairobi to have eight five star hotels, nine four hotels, five three stars and seven two stars and one restaurant which if has a rating of four star totaling into thirty under the classified enterprises.

This study made use of stratified random sampling, which is often considered superior to random sampling and its utilization leads to a reduction in sampling errors. In stratified random sampling a stratum refers to a group in a population having at least one shared attribute.

**Table 1: Sample Population**

<b>Hotels</b>	<b>Target Population- Managers</b>	<b>Sample Size</b>
Five Stars	40	10
Four Stars	45	15
Three Stars	25	10
Two Stars	35	15
Five Star Restaurant	5	5
<b>Total</b>	<b>150</b>	<b>55</b>

The researcher used questionnaires in data collection. Before administering the questionnaires to the respondents a pretest was conducted to ensure that the questions are clear, understandable and relevant. The pretest had a pilot group of three respondents and their results were not included in the main study.

To enhance the validity of the research instrument the opinions of experts on representativeness, suitability of questions used as well as corrections' suggestions required in the structure of the research tool.

The study used Statistical Package for Social Science (SPSS version 22). Using descriptive statistics, the researcher generally describes what is in the data and what the data shows. The most commonly used descriptive statistics include means, percentages and frequencies. Data interpretation was done within the structure and with reference to the research problem of the study.

Linear regression analysis was utilized in the determination of the association between the dependent and independent variables.

The regression model was as follows;

$$Y = \alpha_1 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4$$

Whereby:

Y = SMEs Performance

$\alpha_1$  = Constant

$\beta_1, \beta_2, \beta_3, \beta_4$  = coefficients of the determinants of technological innovation

$X_1$  = Knowledge Diffusion

$X_2$  = Technological Capability

$X_3$  = National Innovation System

$X_4$  = Creativity

## **Research Findings and Discussion**

The sample size of the study was 55 hotel managers in five star, four star, three star and two star hotels in Nairobi County. Out of a sample size of 55 managers, 54 responses were obtained. This gives a response rate of 98.18%. According to Kothari (2004), a response rate of 50% and above is adequate for analysis. Therefore, 98.18% is adequate for analysis and for making inferences and conclusions.

### **Knowledge diffusion**

The study sought to examine the effect of knowledge diffusion exchange through networks and the performance of the Small and Medium Enterprises.

### **Use and Frequency of Training to Improve Performance**

The hotel managers were asked to indicate whether training is used to improve performance of business institutions. According to the findings, 74.1% of the managers indicated that whether training is used to improve performance of business institutions while 25.9% disagreed. This shows that training is used to improve performance in the hotel industry.

The hotel managers were requested to indicate how often training was used to improve performance. From the findings, 46.3% of the hotel managers, who had indicated that training is used to improve performance, indicated that training was taking place once every year, 29.6% indicated once every six

months and 22.2% indicated once a month. This implies that in most hotels in Nairobi training takes place once every year.

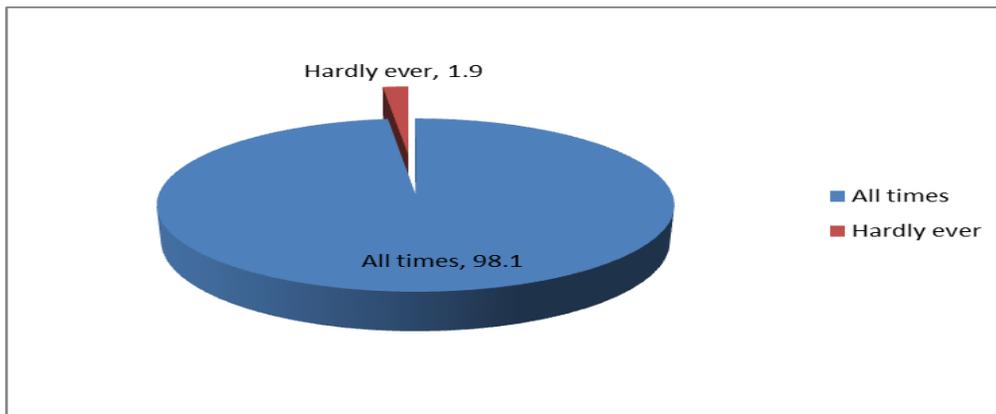
**Table 2: Frequency of Training**

	Frequency	Percent
Once a month	9	22.2
Once every 6 months	12	29.6
Once every year	19	46.3
Total	40	100

The hotel managers were also asked to make recommendations to improve the training process. From the findings, the hotel managers recommended additional training and the use of different trainers to diversify knowledge. They also recommended diversification of training programs and introduction of training departments. The hotel managers further indicated that the human resource department should address staff training needs by conducting regular trainings. The training programs should also address team building, customer service and security issues.

### Use of collaborative research

The hotel managers were asked to indicate how often they use collaborative research to come up with process in the operation of the business. According to the findings, 98.1% of the managers indicated that they all the times use collaborative research to come up with process in the operation of the business. However, 1.9% indicated that they hardly use collaborative research to come up with process in the operation of the business. This implies that they all the times use collaborative research to come up with process in the operation of the business.



**Figure 2: Use of collaborative research**

### Use of inter-firm cooperation in acquiring the new and emerging processes

The hotel managers were also asked to rate the use inter-firm cooperation in acquiring the new and emerging processes in use to offer and improve performance. From the findings, 55.6% of the managers indicated that their hotels rarely used inter-firm cooperation in acquiring the new and emerging processes in use to offer and improve performance, 42.6% indicated that they never used

Inter-firm Corporation and 1.9% indicated that they frequently used Inter-firm Corporation. This implies that hotels rarely used inter-firm cooperation in acquiring the new and emerging processes in use to offer and improve performance. From the managers who indicated that they never used inter-firm cooperation in acquiring the new and emerging processes, the study also sought to find out the reasons. From the findings, they indicated that companies policies do not allow, due to competition inaccurate information given, due to non-Disclosure of company information and reluctance by management. The managers also indicated that participants do not give correct and timely data, unwillingness by the top management and because the process is time consuming.

### **Facilities in Place to Assist In Knowledge Diffusion**

The hotel managers indicated that rate the facilities in place to assist in knowledge diffusion within the institution. According to the findings, 72.2% indicated that the facilities in place to assist in knowledge diffusion within the institutions were good and 27.8% indicated that they were average. This shows that the facilities in place to assist in knowledge diffusion within the institutions were good.

### **Technological capability**

The study sought to assess the influence of technological capability on the performance of Small and Medium Enterprises.

### **Assessment of the process used in technology transfer**

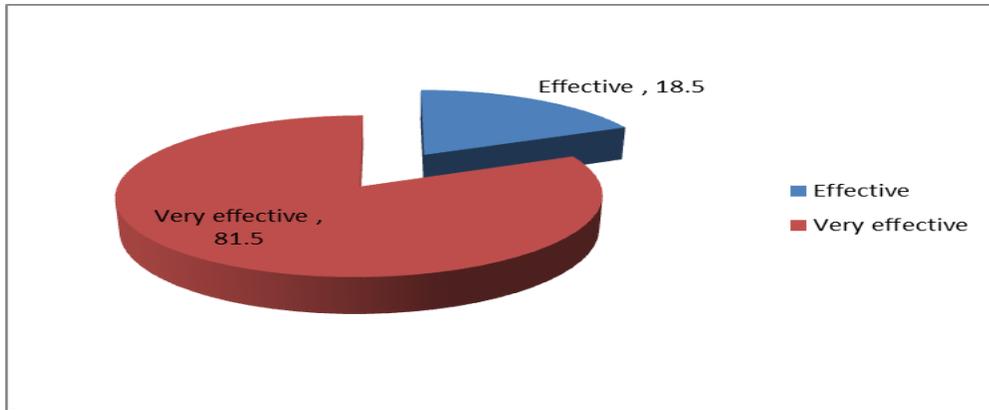
The hotel managers were asked to give their assessment of the process in technology transfer. According to the findings, 87% of the hotel managers' assessment of the process used in technology transfer was satisfactory and 13% was satisfactory though old technologies. This is an indication that assessment of the process used in technology is satisfactory.

**Table 1: Assessment of the process used in technology transfer**

	<b>Frequency</b>	<b>Percent</b>
Satisfactory though old technologies	7	13.0
Satisfactory	47	87.0
<b>Total</b>	<b>54</b>	<b>100.0</b>

### **Effectiveness of facilities put in place to facilitate technological transfer**

The hotel managers were asked to give their opinion on the effectiveness of the facilities put in place to facilitate the technological transfer between the restaurants. The findings shows that, 81.5% of the hotel managers indicated that the facilities put in place to facilitate technological transfer was effective while 18.5% indicated that it was very effective. This shows that facilities put in place to facilitate technological transfer in the hotels were effective.



**Figure 3: Effectiveness of Facilities Put In Place to Facilitate Technological Transfer**

### Evaluation of Resources

The hotel managers were asked to indicate their evaluation on the various resources. According to the findings, 94.4% of the hotel managers agreed that the organization has appropriate resources for innovation needs while 5.6% disagreed. In addition, 68.5% of hotel managers disagreed that when one was engaged to the organization, their orientation included the importance of technological innovation. This shows that hotels in Nairobi have appropriate resources for innovation needs. However, when new staff are recruited to the organization, their orientation does not include the importance of technological innovation.

**Table 2: Evaluation of resources**

	Frequency		Percent	
	Yes	No	Yes	No
The organization has the appropriate resources for innovation needs	51	3	94.4	5.6
When you were engaged to this organization, did your orientation include the importance of technological innovation?	17	37	31.5	68.5

### Academic Qualification and Period worked in the institution

The hotel managers were asked to indicate their academic qualification. From the findings, 61.1% of the hotel managers had post-secondary level of education, 35.2% had university education and 3.7% secondary education. This shows that most of the hotel manager had post-secondary level of education. The hotel managers were asked to indicate the period of time they had worked in their institutions. According to the findings, 46.3% of the hotel managers reported that they had worked in the institution for a period of between 2 and 3 years, 27.8% indicated for a period of six years and above, 20.4% indicated for between 4 and 5 years and 5.6% indicated for one year and below. This shows that most of the hotel managers had worked in the organizations for a period of between 2 and 3 years.

### Facilities in Place to Assist In Research and Development

The hotel managers were asked to rate the facilities in place to assist in research and development to improve the performance of the institution. From the findings, 53.7% of the hotel managers rated the facilities in place to assist in research and development to improve the performance of the institution as good and 46.3% rated it as average. This shows that the facilities in place to assist in research and development to improve the performance of the hotels were good.

### National innovation system

The study sought to examine the role of National Innovation system and performance of the Small and Medium Enterprises.

### Government assistance on the innovation process

The hotel managers were asked to indicate how the government assisted in the national innovation system on the small and medium enterprises. According to the finding, 70.4% of hotel managers indicated that government assistance on the innovation process on small and medium enterprises was average, 20.4% indicated that it was good, 7.4% indicated that it was poor and 1.9% indicated that it was very poor. This implies that government assistance on the innovation process on the small and medium enterprises was average. The hotel managers were asked to give reasons why government assistance on small and medium enterprises was poor. From the findings, the hotel managers indicated that bureaucracy, government lagging behind in technology adoption and old technology were the reasons for the poor innovation process.

### Resources in place to support the innovation culture in the organization

The hotel managers were asked to indicate the resources in place to support the innovation culture in the organization. From the findings, 61.1% of the hotel managers indicated that there was appreciation and recognition of best performance in place to support innovation culture in the organization. Also, 46.3% of the hotel managers indicated that there was an innovation department to support innovation culture in the organization. Further, 40.7% indicate that there were rewards on innovation to support innovation culture in the organization. In addition, 31.5% of the hotel managers indicated that financial allocation for innovation supports innovation culture in the organization.

**Table 3: Resources in place to support innovation culture in the organization**

	Frequencies		Percentages	
	Yes	No	Yes	No
An Innovation department	25	29	46.3	53.7
Financial allocation for innovation	17	37	31.5	68.5
Rewards on innovation	22	32	40.7	59.3
Appreciation and recognition of best performance	33	21	61.1	38.9

### **Interactions with Institutions to Acquire and Transfer New Innovations**

The hotel managers were asked to rate interactions with institutions to either acquire or transfer new innovations both horizontally (across space) and vertically (across levels of organization). From the findings, 64.8% of the hotel managers indicated that interactions with institutions to either acquire or transfer new innovations both horizontally (across space) and vertically (across levels of organization) was average, 31.5% indicated that it was good and 3.7% indicated it was poor. This implies that the rate of interactions with the institutions to either acquire or transfer new innovations both horizontally (across space) and vertically (across levels of organization) was average.

### **Involvement and Frequency of benchmarking**

The hotel managers were asked on whether their institutions ever involved in benchmark to other institutions to compare their level of technological innovation. From the findings, 91% of the hotel managers indicated that their institutions were involved in benchmarking to other institutions to compare their level of technological innovation while 9% disagreed. This implies that the hotels were used as benchmarks to other institutions to compare their level of technological innovation.

The hotel managers were asked to indicate how frequent their institutions ever involved in benchmark to other institutions to compare their level of technological innovation. From the findings, 72.2% of hotel managers indicated that the involvement of their institutions in benchmark to other institutions to compare their level of technological innovation was a continuous process, 18.5% indicated that it was done every day, 3.7% indicated once every two weeks and 1.9% indicated once a week. This implies that the involvement of their institutions in benchmark to other institutions to compare their level of technological innovation was a continuous process.

### **Creativity**

The study sought to assess the link between creativity and performance of the Small and Medium Enterprises.

### **Classification of the Process of Technological Innovation**

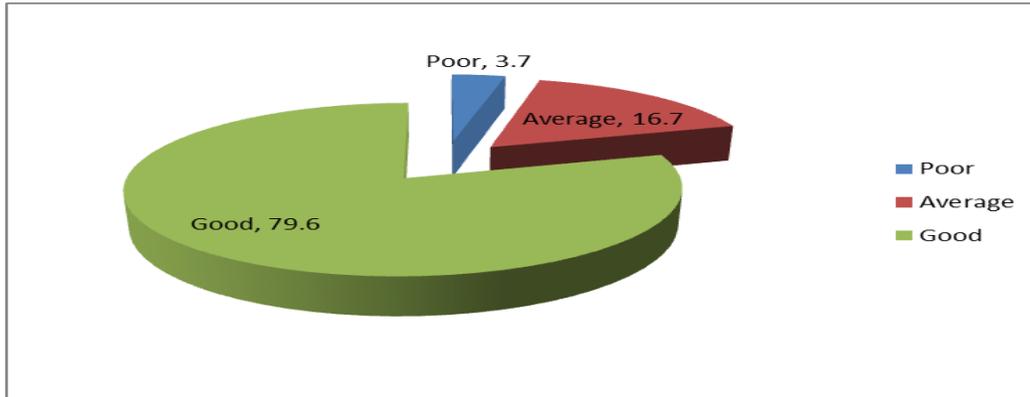
The respondents were asked to indicate how they would classify the process of technological innovation. According to the findings, 64.8% indicated that they would classify the process of technological innovation as top management decision, 55.6% indicated based on research, 25.9% indicated as all participatory and 11.1% indicated as a decision of one person.

**Table 4: Classification of the Process of Technological Innovation**

	Frequencies		Percentages	
	Yes	No	Yes	No
All Participatory	14	40	25.9	74.1
Decision of one person	6	48	11.1	88.9
Based on research	30	24	55.6	44.4
Top management decision	35	19	64.8	35.2

### Rating of the Process Applied

The hotel managers were requested to rate the process of technological innovation as applied. According to the findings, 79.6% of the managers indicated that the process of technological innovation as applied was good, 16.7% indicated that it was average and 3.7% indicated that it was poor. This implies that process of technological innovation as applied in hotels in Nairobi was good.



**Figure 4: Rating of the Process Applied**

### Aspects of Innovation As Used in the Institution

The hotel managers were asked to rank various aspects of innovation as used in the institution. Where 1 is very often, 2 was often and 3 was rarely. From the findings, 72.2% of the hotel managers indicated that embracing change was very often used in their institutions, 24.1% indicated often and 3.7% indicated rarely. In addition, 57.4% of the managers indicated that constant learning was very often used in their institutions, 38.9% indicated that it was often used and 3.7% indicated that it was rarely used. Further, 48.1% of the hotel managers indicated that they very often use heightened expectations, 46.3% indicated that it was often used and 5.6% indicated that it was rarely used. Also, 75.9% indicated that they rarely used trust instincts, 13% indicated that it was often used and 11.1% indicated that it was very often used. This implies that aspects of innovation used in most hotels in Nairobi County include embracing change, constant learning and heightened expectations. However, the hotels rarely used trusting of instincts as an aspect of innovation in the hotels.

**Table 5: Aspects of Innovation As Used in the Institution**

	Very often	Often	Rarely
Heightened expectations	48.1	46.3	5.6
Constant learning	57.4	38.9	3.7
Embrace change	72.2	24.1	3.7
Trust instincts	11.1	13.0	75.9

## Regression Analysis

The study used multivariate regression analysis to assess the influence of the independent variables on the dependent variable.

The multivariate regression model was as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Whereby; Y was performance,  $B_0$  was a Constant,  $\beta_1$ -  $\beta_4$  were Coefficients of determination,  $X_1$  was knowledge diffusion,  $X_2$  was technological capability,  $X_3$  was national innovation process,  $X_4$  was creativity,  $\varepsilon$  was Error term.

**Table 8: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.906 <sup>a</sup>	.820	.806	.27395

The model summary shows the r-squared, which is the proportion of variance in the dependent variable that can be explained by the independent variables. The r-squared in this study was 0.820. This implies that the four independent variables (creativity, technological capability, knowledge diffusion, national innovation process) can explain 82% of the dependent variable, performance of Hotels in Nairobi County.

**Table 9: Analysis of Variance**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.808	4	4.202	55.993	.000 <sup>b</sup>
	Residual	3.677	49	.075		
	Total	20.486	53			

In regression analysis, the analysis of variance is used to test whether the model is a good fit for the data. From the findings, the F-calculated (55.993) is greater than the F-critical (2.56) and the p-value (0.000) is less than the significance level (0.05). This implies that the model is a good fit for the data and hence can be used in predicting the influence of creativity, technological capability, knowledge diffusion and national innovation process on the performance of Hotels in Nairobi County.

**Table 60: Regression Coefficients**

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.527	0.243		6.284	0.000
Knowledge diffusion	0.331	0.128	0.351	2.586	0.001
Technological capability	0.115	0.048	0.013	2.396	0.012
National Innovation process	0.603	0.153	0.721	3.941	0.000
Creativity	0.436	0.149	0.511	2.926	0.000

The regression model will be;

$$Y = 1.527 + 0.331X_1 + 0.115X_2 + 0.603X_3 + 0.436X_4 + \varepsilon$$

Holding all the independent variables (creativity, technological capability, knowledge diffusion and national innovation process), the performance of Hotels in Nairobi County will be having an index of 1.527. The beta coefficient for the association between knowledge diffusion and the performance of Hotels in Nairobi County was 0.331. This shows that a unit improvement in knowledge diffusion will lead to a 0.331 improvement in the performance of Hotels in Nairobi County. The relation was significant as the p-value (0.001) was less than the significance level (0.05). The results show that technological capability has a positive influence on the performance of Hotels in Nairobi County as shown by a beta coefficient of 0.115 and a p-value of 0.012. This implies that a unit improvement in technological capability would lead to a 0.115 improvement in the performance of Hotels in Nairobi County. The association was significant as the p-value (0.012) was less than the significance level (0.05).

The results further indicated that a national innovation process has a positive influence on the performance of Hotels in Nairobi County as indicated by a beta coefficient of 0.603 and a p-value of 0.000. This shows that a unit improvement in the national innovation process would lead to a 0.603 improvement in the performance of Hotels in Nairobi County. The association is significant because the p-value (0.000) was less than the significance level (0.05). Lastly, the results show that creativity has a positive influence on the performance of Hotels in Nairobi County as shown by a beta coefficient of 0.436 and a p-value of 0.000. This implies that a unit improvement in creativity would lead to a 0.436 improvement in the performance of Hotels in Nairobi County. The association was significant as the p-value (0.000) was less than the significance level (0.05). From these results we can infer that national innovation process was the most significant factor influencing the performance of Hotels in Nairobi County, followed by creativity, knowledge diffusion and technological capability.

## Conclusions

The study concludes that knowledge diffusion has a significant influence on the performance of Hotels in Nairobi County. The study found that training, collaborative research and technology projects, inter-firm cooperation and facilities for technology transfer have an influence on the performance of Hotels. The study also concludes that technological capability has a significant influence on the performance of Hotels in Nairobi County. The study established that skilled labor, technology transfer, product design, resources allocation and research and development influence the performance of Hotels.

The study further concludes that national innovation process has a significant influence on the performance of Hotels in Nairobi County. The findings of the study revealed that institutional linkages, culture, partnerships with government and setting benchmarks have an influence on the performance of Hotels. Lastly, the study concludes that creativity has a significant influence on the performance of Hotels in Nairobi County. The study revealed that entrepreneurship, innovation, risk taking and persistence have an influence on the performance of Hotels in Nairobi County.

## Recommendations

The study found that more than one quarter of the hotels in Nairobi County were not using training to improve the performance of business institutions. This study recommends that the management of hotels in Kenya should ensure that there are consistent and frequent trainings of their employees. These can be held annually or by annually. Training plays a major role in improving employees' knowledge and skills, which in turn improves performance and productivity.

The study also recommends that hotels in Nairobi County should ensure diversification of their training programs by using different trainers and holding the trainings in different venues. In addition, the training programs should be geared towards meeting employees training needs. The study found that although there was technology adoption in most of the hotels, some hotels were still using old technologies and manual systems. In the current turbulent business environment in the hotel industry, hotels should adopt information technology.

The study found that when new staff are recruited to the hotels, their orientation does not include the importance of technological innovation. This study recommends that hotels' managements should include orientation of technological innovations during the orientation of new employee. The study also established that government assistance on the innovation process on the small and medium enterprises was low. This study therefore recommends that the government of Kenya should come up with policies geared towards improving the innovation process among SMEs. The study revealed that in most organizations the process of innovation was not all participatory. Employee involvement is a key factor in the innovation process and helps in reducing resistance to change. This study therefore recommends an all participatory approach during the innovation process.

## Areas for Further Studies

This research study was limited to the hotel industry in Nairobi County and hence its findings cannot be generalized to other Small and Medium Enterprises (SMEs). The study therefore suggests that similar studies should be conducted in the other categories of Small and Medium Enterprises in Nairobi County such as the manufacturing sector and service industries. The study also found that the found independent variables used in this study could explain 82% of the performance of hotels in Nairobi County. The study therefore suggests further studies on other factors influencing the performance of hotels in Nairobi County.

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