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INFLUENCE OF TECHNOLOGICAL INNOVATION ON PERFORMANCE OF SMALL AND MEDIUM ENTERPRISES IN NANYUKI TOWN, LAIKIPIA COUNTY, KENYA

[1]Dinah Kathure Majau, [2]Dr. Mary Ragui

[1, 2] Department of Business Administration, School of Business, Kenyatta University, Kenya

Abstract: **The main objective of the study was to investigate the influence of technological innovation as a business process reengineering platform on performance of small and medium enterprises in Nanyuki town, Laikipia County, Kenya. The study employed descriptive and cross sectional research design to collect the views and opinions of the respondents. The target population was owners and employees of 1,150 small and medium enterprises in Nanyuki town. Stratified random sampling technique was used to select a sample of 10 percent of the target population. The unit of analysis was SMEs in Nanyuki town and the unit of observation was the owners and employees of these individual SMEs. Data was collected through a self-administered questionnaires.The findings showed that technological innovations were used to a moderate extent by majority of SMEs. The most common technological innovation used was new production processes and new product systems. This was indicated by the high contribution of technological innovation and office automation on the performance of SMEs. The study recommended that SME owners should strive to adopt new product systems to produce new products in the market thereby achieving a competitive edge which will result in increased performance.**

Keywords: **Technology, Innovation, Performance, Enterprises.**

1. INTRODUCTION

Information technology is a Business Process Reengineering (BPR) platform that has been used to breakdown communication barriers between corporate functions in order to fuel process reengineering. It includes reshaping how the business is done and empowering process plan through making a more adaptable, group situated, coordinative and correspondence based work capacity. BPR again is the basic reevaluating and radical update of business procedures to accomplish sensational changes in basic measures of execution, for example, cost, quality, administration and speed (Hindle, 2008). BPR is about development and change and process update and IT are its fundamental fixings (Thyagarajan & Khatibi, 2004).

Attaran (2004) suggests that IT is one of the several BPR platforms, other than HR and hierarchical change, that all must be viewed together to achieve change in business forms. As a BPR stage, it encourages reengineering process using venture administration apparatus. These assist to recognize structure and gauge BPR exercises and help control possibilities that emerge amid the procedure. It gives organizations a better route than interface and incorporate exercises between workers, outside accomplices, providers and clients (Wu, 2006). Likewise, it breaks presumption of physical world and empowers a more compelling creation, documentation and sharing of data and information (Attaran, 2004; Tippins & Sohi, 2003).

IT facilitates assembling and investigating data of the procedure execution and structure, mapping the current procedure and measuring the outcomes for cost, quality and time. IT devices encourage this by archiving business forms, dissecting overview information and performing organized assessment (Attaran, 2004). It enhances the utilization of programming to change over, store, process, transmit, and recover data. IT impacts BPR through authoritative structure changes whereby hierarchical chains of importance turn out to be more level and the level of basic leadership centralization is brought down. It additionally upgrades supervisor data handling limit and by sharing and trading data through it, workers can straightforwardly answer to chiefs (Pan and Jang, 2008). Hierarchical execution is upgraded through contracting separation and unwinding time limitations to permit authoritative individuals in various time zones and areas to cooperate on similar errands (Dube, Liu, Wynter & Xia, 2007).Communication and availability inside an association turns out to be more straightforward and cross-unit joint effort among geologically scattered units is expanded (Sarkar and Sing, 2006).

IT as a BPR platform reduces the number of workers because of computerization in numerous business rehearses, for example, production network administration, arrange administration and client benefit administration. Firms can contract out non-center, proficient, or work concentrated organizations, for example, programming, arrange administration, client administrations, and statistical surveying to accomplices keeping in mind the end goal of lessening expenses and seeking effectiveness which impacts emphatically on execution of SMEs (Dube et al., 2007). IT assumes the main part via robotizing errands, enabling a business to update its procedures and by finding new and better methods for working together. It is utilized to accelerate routine procedures, as well as to upgrade those procedures so as to accomplish emotional changes in profitability. Numerous supervisors surrender that an extensive piece of their prosperity gets from utilizing IT to reengineer business forms (Peyman, 2006). Research by Cragg, King and Hussin (2002), takes note of how IT venture can affect SMEs execution and that adjusting IT to SMEs marketable strategies can comprehend the connection amongst IT and business execution.

With the development of computer technology, the office model in modern SMEs has transformed from the stage of large-scale use of photocopiers to the stage of large-scale use of office automation software. Workflow-based office automation system enhances efficiency and save cost. Microcomputer prevalence in offices has been accompanied by the increasing spread of new communication and information storage products and major changes in administrative procedures (Hassan, Sahraei, Zakrifar & Talebi, 2014). In the beginning, computer systems were used for correspondence independently but over time, computers have been linked together. This connection allows users to not only share their correspondence files but also exchange information with each other. Automation systems have a great effect on the correctness, accuracy and timelines of managers' decisions. These systems with the benefit of modern tools can help and support the managers in order to achieve management goals (Hassan et al., 2014). Productivity and effectiveness as a result of automation of processes and easier access to information is critical with regards to making decisions about customers and competitors. Information obtained about customers allows for targeted marketing initiatives which increase the level of customer service delivery (Barba-Sanchez, 2007).

Developments in technology have brought about new delivery channels for SMEs products and services such as the mobile phone technology. This technology has contributed towards reducing costs, increasing income and reducing uncertainty and risks. Samuel, Shah and Hadingham (2005) highlighted the importance of mobile phone technology to SMEs in South Africa, Tanzania and Egypt. They noted that 60 percent of the SMEs surveyed in each country reported that the use of mobile phone technology increased the profitability of the business. Digital marketing is another modern innovation that lets SMEs promote their products and services all over the world. It includes concepts such as pay per click, blogging, discussion forum, social media marketing and search engine optimization. Web marketing is on the rise because most SMEs have realized long term performance of their businesses is not possible without digital presence on the internet. Through internet and cloud technology, managers can now manage and monitor their business resources virtually anywhere in the world.

Knowledge management systems lessen new item and administration advancement cost and time-to-advertise therefore enhancing the benefit of the associations. With the assistance of information administration frameworks, SMEs can obtain client learning and make client arranged advertising technique. This enhances the viability and effectiveness of showcasing and makes more esteem for the clients (Schultze & Leidner, 2002). Learning ought to be connected in deciding, showcasing and developing forms (Gold & Arvind-Malhotra, 2001). The procedure of learning application is to coordinate new information into existing learning and use them to determine issues. Information administration framework can enable workers to locate the perfect individual or right learning thus rapidly decreasing expenses for the SMEs. On the chance that SMEs don't oversee learning great, the firm may not develop and thus information administration framework is one key component for their prosperity. Today numerous SMEs are attempting to make fruitful information administration frameworks with a specific end goal of increasing upper hand and developing quickly.

There is no one meaning of SMEs that is generally acknowledged (Mutula and Brakel, 2006). Diverse nations embrace distinctive criteria, for example, work, deals or speculation for characterizing little and medium ventures. Association for Economic Co-operation and Development (OECD) in Kenya (2004), characterizes SMEs as endeavors that have under 500 representatives. In Britain SMEs are characterized as ventures with yearly turnover of 2 million pounds or less and with less than 200 paid workers while in Australia, SMEs are characterized as endeavors having in the vicinity of 5 and 199 representatives (Kotey and Folker, 2007). In Indonesia SMEs are characterized as a venture with 5 to 99 workers (Mira, 2006). In Kenya, they are characterized as organizations working in both the casual and formal segments of the economy and utilizing in the vicinity of 5 and under 50 representatives (Republic of Kenya, 2005). The part of little and medium undertakings in the financial improvement of the nation is all around characterized. The area is a foundation of business enterprise that is driven by innovativeness and advancement. Gunu (2004) and Aremu (2010) noticed that little and medium venture give pay and work era. In Kenya the SME division contributes an expected 18 percent of the GDP and additionally making work for 80 percent of the workforce populace (Kithae, Gakure and Munyao, 2012).

SMEs are critical on the grounds that they are key drivers of monetary development. At a large scale level, SMEs have made the dominant part of new occupations in OECD nations and at a small scale level, SMEs are famously looked upon by governments as a cornerstone to financial and group recovery. Through a multiplier impact, business gives salary to districts which drives riches and ensures further formation of work (Walker and Brown, 2004). In Africa, SMEs utilize more than 40 percent of every single new contestant to the work on the grounds that they have a tendency to be more work concentrated than vast firms and are therefore better put to mitigate joblessness (Muuka, 2002). Further, surviving examination has shown that SMEs have contributed enormously to work creation and in advancing social financial advancement (Mutula & Brakel, 2006). In this manner, as indicated by a standard study directed in 1999 in Kenya, the SME segment utilized 5.1 million individuals, representing 74 percent of the aggregate business. In acknowledgment of the significance of the sector in 2003, the Kenyan Government made a SMEs approach structure to advance work creation and increase earnings generation.

SMEs are not a homogeneous arrangement of organizations but rather a heterogeneous gathering of organizations generally working in the administration, exchange, agri-business and assembling of parts (Lukacs, 2005). They fluctuate in measure, age, segment, inspiration, method of association, ethnic foundation, area, information base, control of assets and creative limit (Vivienne & Roberts, 2005). Many examinations have inspected the distinctions in administration style between expansive organizations and SMEs (Sharma & Bhagwat, 2006). These examinations have demonstrated that, among different attributes, SMEs have a tendency to have a little administration group, they are emphatically affected by the proprietor and the proprietor's propensities, they have little control over their own particular condition and they want to stay free (Dennis, 2000; Drakopoulou-Doddet, Jack & Anderson, 2002).

Small and medium enterprises are widely recognized for their role in the social, political and economic development. According to the management of Laikipia County government there are 4,000 registered SMEs in the whole of Laikipia County with those operating in Nanyuki alone standing at 1,150 as at March 2016. They include service or retail operations such as small and medium shops, chemists, hotels and restaurants, supermarkets, cyber cafes, small and medium petrol filling stations, butcheries, small and medium transport companies and juakalis. They deal with provision of goods and services such as skilled manual work, transport services, consultancy, internet services, groceries, lodging facilities and catering services.They also act as a driver in the promotion of competition, innovation and enhancement of enterprise culture.

SMEs in Nanyuki town are very heterogeneous in nature, cutting across all sectors of the economy. Regularly the accompanying highlights in shifting degree describes them; little units, rustic based, family possessed, little free ventures, all around characterized showcase, depend on minimal effort crude materials, low work cost, little creation lines, low capital development and to a great extent work concentrated units with low level advances. They invigorate private proprietorship and entrepreneurial abilities, produce work, are adaptable and can adjust rapidly to changing business sector request and help broaden monetary action. Their perfomance is indicated by marginal profits, return on assets, customer loyalty and effeciency of business processes.It is largely influenced by several factors such as availability of financial and capital resources, access to business information services, the level of IT adoption, the level of management skills and external macro environment factors such as competitors and politics. It is also influenced by the networks that the owner has in relation to other businesses (Osoro & Muturi, 2013).

2. STATEMENT OF THE PROBLEM

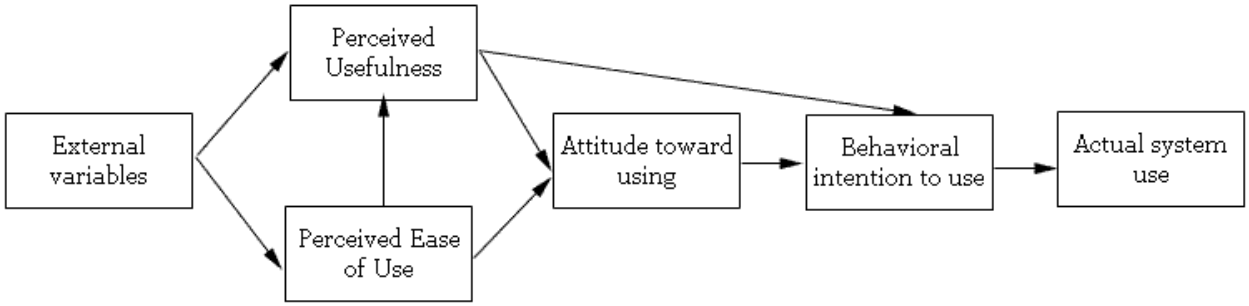
Regardless of their significance and the expanded endeavors by the legislature of Kenya and different partners to guarantee the accomplishment of small and medium enterprises, past insights show that they display high birthrates and high passing rates with 40% of the new businesses flopping by year two and no less than 60% shutting their entry ways by year four (Kenya National Bureau of Statistics, 2015). SMEs in Kenya have difficulties in growth. They hardly grow beyond the start-up stage. Others go out of business at a very early stage. These high cases of SME failure reported are as a result of SMEs not investing in IT since its adoption is a matter of survival not choice. According to Laikipia County Integrated Development Plan (2016), 80% of SMEs in Nanyuki town have not fully invested in IT ; only 20% have embraced it. This is a strong indicator that in Nanyuki town there is a high degree of poor SME perfomance and consequently an underlying issue with IT adoption. Technological innovation, office automation and knowledge management were selected as variables in the study because they are easily adopted by SMEs and are easily measurable in the study.

Little has been done to assess the influence of information technology as a BPR platform on performance of SMEs. Previous researches have revealed existing contradictions on influence of IT on performance of SMEs. Studies by Chae, Koh and Prybutok (2014) revealed that SMEs which are IT leaders are not associated with higher profit or low cost ratios while studies by Carr (2003) suggests that IT no longer offers any competitive advantage and has become an operational commodity to SMEs. These findings reveal varying impact of IT among SMEs. Therefore there is need to fill this gap by conducting empirical enquiry to investigate this study.

3. LITERATURE REVIEW

Davis (1989) developed this model to explain acceptance of information technology systems for different tasks which in this study is office automation. The Technology Acceptance Model (TAM) sets up that client appropriation of another data framework is dictated by the client's goal to utilize the framework, which is thus controlled by the client's convictions about the framework (Bagozzi, 2007). It analyzes the intervening part of perceived usability and perceived helpfulness in their connection between frameworks attributes. Davis (1989) distinguished two suspicions (perceived helpfulnes and perceived usability) as the fundamental deciding components in data framework acknowledgment. They characterized perceived value as how much a purchaser trusts that the utilization of a framework will expand his or her execution. In his investigation he proposed four things ordinarily utilized as estimation devices. That is utilizing the framework application will build profitability, execution and adequacy at work and by large the framework is helpful in the occupation (King and He, 2006). In particular, it alludes to viability at work, profitability which is comprehended as efficient and the relative significance of the framework to the person's work (Fathema and Sutton, 2013).

Perceived ease of use on the other hand alludes to how much a customer trusts that no exertion will be required to utilize the framework, with exertion being comprehended to incorporate both physical and mental exertion, and that it is so natural to figure out how to utilize the framework (Fathema and Sutton, 2013). Furthermore, perceived usability impacts perceived convenience. Genuine conduct is the noticeable reaction in a given circumstance as for a given target (Ajzen, 1991). Intention means a man's preparedness to play out the given conduct (Ajzen, 1991). This study considers office automation acknowledgment as the real conduct. Office mechanization frameworks should be both simple to learn and simple to utilize, on the grounds that when an application is seen to be simpler to use than another, it will probably be acknowledged by clients.



Source: Davis, Bagozzi & Warshaw (1989)

Figure 1: Technology Acceptance Model

The components of this hypothesis are viewed as fundamental in this examination since they clarify what a SME will take into consideration while adopting a technology. SMEs will embrace the sort of technology which can meet the prerequisites of their association as far as usefulness is concerned and which can be effortlessly utilized by the workers. In the meantime, the technology ought to have a capacity to incorporate different capacities in the association and this ought to be mechanized in order to spare time and cash since associations work to amplify benefit and limit their operation costs. This hypothesis supports office computerization variable of the examination by giving proof that apparent convenience (client acknowledgment) and the apparent helpfulness (usefulness) of the frameworks introduced impact clients to acknowledge the frameworks put in the associations with the end goal of enhancing the level of administration quality since specialists will just acknowledge frameworks that can be connected with less challenges.

In Márquez-Ramos and Martínez-Zarzoso (2010) study, the impact of mechanical advancement on sectorial fares was broke down utilizing a gravity model of exchange. Discoveries showed a positive and non-straight impact of mechanical development on send out execution which demonstrates that there are limits for positive signs to happen. Umar, Danjuma, Hammawa and Habibu (2016) looked to give experimental proof on the connection between green production network administration rehearses, mechanical advancement and green execution with regards to assembling in little and medium undertakings in Nigeria. Discoveries uncovered that positive huge relationship exist between green production network administration practices and green execution in little and medium undertakings. Additionally, mechanical advancement was found to have impacted the green execution of little and medium undertakings, accordingly displaying fractional interceding impact in the conceptualized relationship. Kimingi (2010) looked to explore the impacts of mechanical advancement on the execution of business banks in Kenya. The examination reasoned that mechanical advancements had prompted enhanced money related execution of business banks in Kenya.

Bayo-Moriones, Billón and Lera-López (2013) findings demonstrated a positive connection between ICT selection and every one of the measures of perceived execution dissected, despite the fact that the effect was not generally prompt since the length varied by the sort of ICT. ICT effect on definite execution (piece of the overall industry, benefits and edge) occurred for the most part by implication through the change of inner and outside correspondence, and in addition through operational execution. Gwako (2012) uncovered that ICT proficiency as a variable of appropriation had a fairly powerless relationship with business execution of SMEs in Nakuru town. Utilization of ICT in business systems had an extremely feeble relationship with the execution markers given the accessibility of assets for appropriation. ICT posted a solid level of relationship with similar markers. Adewoye and Akanbi (2013) ponder detailed a huge advantage of ICT speculation on the organization productivity. The combined specimen 't" test estimation of 1.809 which was noteworthy ($P<0.1$) likewise inferred that there was huge connection between ICT venture and productivity of the organizations.

4. RESEARCH METHODOLOGY

The study employed descriptive and cross sectional research design to collect the views and opinions of the respondents. The target population was owners and employees of 1,150 small and medium enterprises in Nanyuki town. Stratified random sampling technique was used to select a sample of 10 percent of the target population. The unit of analysis was SMEs in Nanyuki town and the unit of observation was the owners and employees of these individual SMEs. Data was collected through a self-administered questionnaires and analyzed descriptively.

5. FINDINGS

The study sought to establish technological innovation practices of SMEs by assessing use of various innovations and their effects on SMEs' performance. Respondents in the study were asked to indicate the extent to which their enterprise made use of various technological innovations.

Table 1

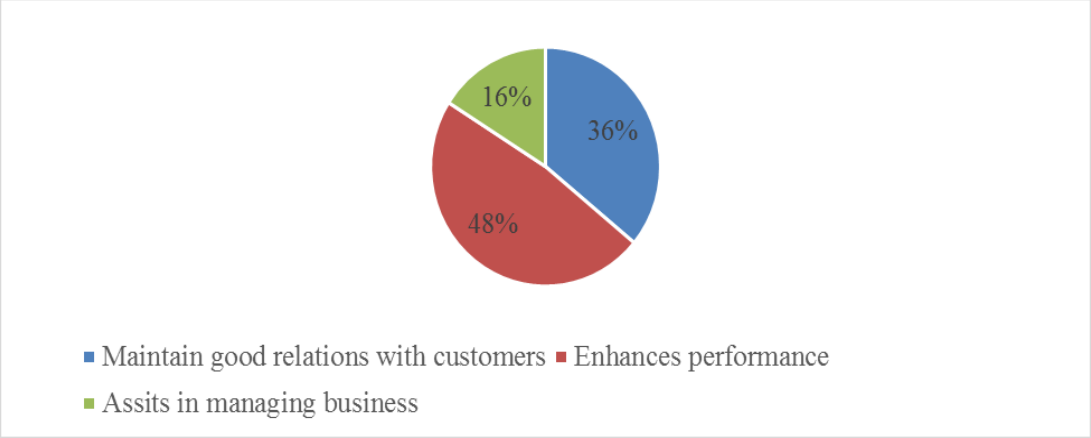
Innovation	N	Minimum	Maximum	Mean	SD
New production processes	109	1	5	3.06	1.12
New customer relationship systems	109	1	5	3.18	1.13
New product systems	109	1	5	3.16	1.07
Total				**9.4**	**3.32**
Average				**3.1**	**1.1**

Source: Field data (2016)

The mean for the three items was 3.1 indicating that technological innovations were used to a moderate extent. The standard deviation values were between 1.0 and 1.15 which indicates the convergence of views, and the lack of a large dispersion in the answers. The findings therefore show that technological innovations were used to a moderate extent by majority of SMEs. These findings are therefore consistent with those of Sarkar and Singh (2006) and Anila naz (2013) who found that innovation in small firms was low.

Technological innovation (p=0.001) was found to be statistically significant at 95% confidence level. The first hypothesis is therefore rejected and the study concludes that there is a relationship between technological innovation and performance of SMEs in Nanyuki town. This finding is in agreement with Frishammar and Hörte (2005) who found that firm execution is upgraded when imaginative action is supplemented by IT activities that result in the orderly presentation of new creation procedures and items. What's more the finding is in concurrence with Kimingi (2010) who found that mechanical advancements had prompted enhanced monetary execution of business banks in Kenya. In conclusion the finding is in concurrence with Bayo-Moriones et al. (2013) discoveries which demonstrated a positive connection between ICT reception and other measures of performance analyzed.

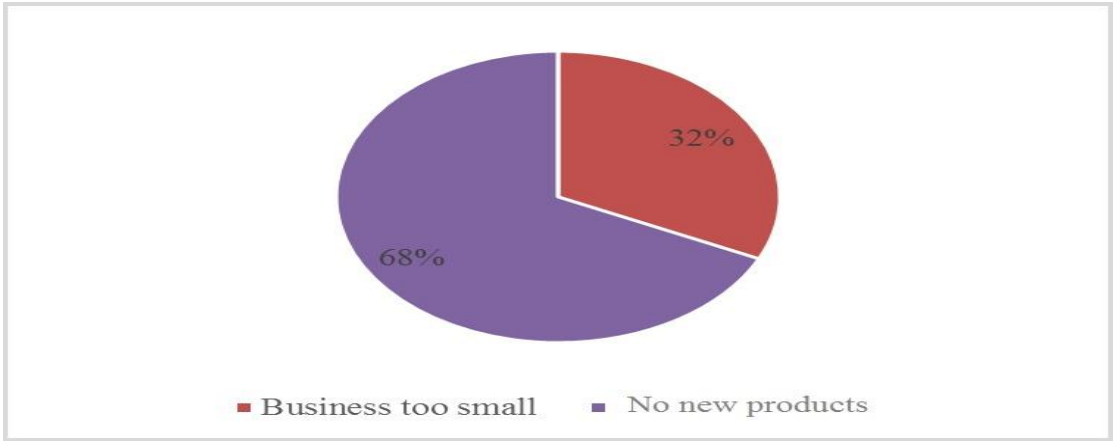
Respondents who indicated that they used technological innovations to a large extent, the study sought to find out why they made use of them.



Source: Field data (2016)

Figure 1: Reasons Behind Use of Technological Innovations

Findings in Figure 2 show that 48% of respondents indicated that they used technological innovations because it enhanced performance and therefore growth of their business. This is in agreement with Samuel et al. (2005) who found that technological innovations contribute towards reducing costs, increasing income and reducing uncertainty and risks. Respondents who indicated that they did not use or lowly used technological innovations were asked to provide reasons why.



Source: Field data (2016)

Figure 2: Reasons Behind Low or Non-Use of Technological Innovations

Majority (68%) of the respondents in the study indicated that their business was too small to be using the said technological innovations. 32% indicated that they had no new products as either there was no production process in the business or majority of products were already in the market.

6. CONCLUSION AND RECOMMENDATIONS

The study concludes that the influence of information technology as a BPR platform has a strong positive effect on performance of small and medium enterprises in Nanyuki town, Laikipia County with moderation of political factors. This is indicated by the high contribution of technological innovation and office automation on the performance of the SMEs. Technological innovation brings about enhanced performance through new production processes, new customer relationship systems and new product systems. SMEs which adopted technological innovation to a great extent were found to have high performance. Technological innovation is therefore a driving force for achieving and sustaining performance and helping SMEs develop strategic capabilities to deal with the enhanced dynamism and uncertainty of the business environment. SME owners and employees should strive to adopt new customer relationship systems in the market thereby achieving a competitive edge which will result in increased performance. The owners should also adopt information exchange systems to allow employees to appropriately access and securely share businesses' important information electronically thus improving the speed, quality, safety and cost of doing business.

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