Int Journal of Social Sciences Management and Entrepreneurship 8(3): 1162-1176 2024

ISSN 2411-7323

www.sagepublishers.com

DIGITAL INNOVATION STRATEGY AND PERFORMANCE OF MANUFACTURING FIRMS IN NAIROBI COUNTY, KENYA

[1] Wako Jattani Galgallo, [2] Dr. Mwanzia Mary

[1]Masters Student, Jomo Kenyatta University of Agriculture and Technology
[2]Lecturer, Jomo Kenyatta University of Agriculture and Technology

ABSTRACT

The manufacturing sector is a critical component of Kenya's economy, contributing significantly to employment, GDP, and export earnings. However, firms in Nairobi County, the industrial hub of the country, face numerous challenges including high operational costs, inefficient production processes, and stiff competition both locally and globally. The general objective of the study was to determine the effect of digital innovation strategy on performance of Manufacturing Firms in Nairobi County, Kenya. Specifically, the study sought to assess the effect of process innovation on performance of manufacturing firms in Nairobi, Kenya and to analyze the effect of Market innovations on performance of manufacturing firms in Nairobi, Kenya. The study used descriptive survey design. The target population for this study was manufacturing companies in Nairobi County. According to Kenya Association of Manufacturers (KAM, 2022), there are 91 medium Food and beverage manufacturing companies in Nairobi County. These manufacturing firms were the unit of analysis while the management employees were the unit of observation. The object from which information is obtained is referred to as a unit of observation. Therefore, 546 managers in the 91 manufacturing companies were targeted. The Yamane formula was adopted to calculate the study sample size. Therefore, the study sample size was 231 respondents. The stratified random sampling method was adopted to select the study sample size. This study used primary data collected using a semi- structured questionnaire. Statistical Package for Social Sciences (SPSS) was used to analyze the data. Descriptive and inferential statistics was computed and findings presented in tables and figures. The study concludes that process innovation has a positive and significant effect on performance of manufacturing firms in Nairobi, Kenya. The study also concludes that market innovations have a positive and significant effect on performance of manufacturing firms in Nairobi, Kenya. Based on the findings, the study recommends that the management of manufacturing firms in Kenya should implement advanced automation technologies. By incorporating automation into production processes, firms can achieve greater efficiency, reduce error rates, and lower labor costs. Automation tools, such as robotic systems and smart sensors, can streamline operations, enhance precision, and accelerate production timelines.

Key Words: Digital Innovation Strategy, process innovation, Market innovations, Performance of Manufacturing Firms

Background of the Study

In today's dynamic and fiercely competitive corporate landscape, digital innovation has emerged as a pivotal driver of success for organizations across various industries (Agustian et al., 2023). The advent of digital transformation represents a watershed moment in the business environment, precipitating a tectonic shift away from traditional models towards those that are markedly technology-centric (Mahardhani, 2023; Verhoef *et al*., 2021). Digital transformation has opened up new avenues for organizations to forge closer connections with their customers (Masoud & Basahel, 2023)

The rapid pace of technological advancement, coupled with globalization and an uncertain business environment, has necessitated a strategic shift towards digitalization to remain competitive and achieve desired performance outcomes (Kraus et al., 2021). Digital innovation encompasses a wide range of technologies and practices, including data analytics, distributed collaboration, and strategic visioning, all aimed at enhancing operational efficiency, driving growth, and fostering a culture of continuous improvement (Hund et al., 2021).

The modern corporate world is defined by competition, globalization, and an uncertain environment, and only organizations that have digitalized their operations can effectively compete and reach its desired performance (Harlow, 2018). This is particularly apparent among manufacturing sector players which have had to innovate and change their operations in order to effectively and efficiently perform , which are in the forefront of using data analytics to boost performance and gain a competitive edge. Applications for data analytics support company success, according to Alipour and Harris (2020). This is because it incorporates the science of drawing conclusions from the examination of unprocessed data. Wang et al. (2017) suggest that by digitally innovating, a firm is able to find patterns and indicators that might otherwise get lost in the flood of information, gain a competitive advantage and boost performance. These techniques also aid in gathering information that may be utilized to streamline procedures and increase a system's general efficiency. Kornberger (2016) add that with the rapid development of digital technology, the storage and dissemination speed of information and knowledge required for innovation has greatly increased, communication and search costs have dropped significantly and the focus of innovation has shifted from within the organization to distributed entities that cannot be specified in advance.

The tradition innovation theory holds that the innovation theory occurs from a central position in a firm. However, in a digital economy, innovation is no longer centralized in a single organization but rather is distributed among multiple stakeholders in a value network (Bogers and West, 2012). In the current operating dispensation, cooperation among various stakeholders that sometimes crosses borders is necessary for heterogeneous knowledge sharing and flow of explicit and tacit knowledge of enterprises in the value network. In relation to the breath of cooperation, the wider the span of the network, the better the sources of innovation and therefore since digital innovation can take place remotely, organizations should encourage a wider cooperation and consultation. Walsh et al. (2016) found that horizontal external cooperation helps organizations improve the quality of innovation.

The enormous potential of digital technology in the innovation process has been claimed to be due to its ability to improve operations and promote organizational growth (Wang, 2021). In Chinese manufacturing companies a positive correlation between digital innovation technology and process-based performance and tend to exhibit a U-shaped continuum in relation to the firm performance. Further, in the Chinese manufacturing sector, digital innovation has been found to have a lasting effect on the operational performance due to its cost reduction effect and shorter of product introduction in the market. The same positive effect of digital innovation strategy on a firm outcome is registered among Taiwanese financial sector who are found to favor digital technologies in their innovations, which in turn improve their financial performance.

Chege, Wang and Suntu (2020) in a research on the impact of information technology innovation on firm performance in Kenya argue that innovative ideas encompass the use of information technology to access new markets and gain a competitive advantage emanating from greater interactivity, cheaper transactions, and direct communication with partners and clients. They reiterate that changes that is emanating in the business environment have led firms to increasingly rely on IT to achieve and retain competitiveness through improved productivity, and prosper in contemporary dynamic markets. Consequently, the performance of SMEs in Kenya was found to depend on their capability to manipulate market opportunities through use of rapid technology innovation. Akinwale et al. (2017) find that business entities performance improves when it adopts different ICT innovation in their operating eco-system and thus affirming the existence of a significant relationship between technological innovation and performance.

An organizations' digital strategy is one that is formulated and executed by leveraging digital resources to create differential value. Leischnig, Woelfl and Ivens (2016) explains that business digital strategy would require the usage of emergent technologies like cloud computing, occur at the business-level or firm-level strategy and not at functional-level and aims at appropriating value for firms through digital technologies. The implication of adopting a business level digital strategy is that there is need for a change existing infrastructure and the organizations leadership support will be necessary. Chi, Lu, Zhao and Li (2018) add that a digital business strategy transcends traditional functional areas because with the aid of the inter-firm level strategy, a firm-level strategy can improve the functional-level efficiency and effectiveness. Henfridsson, Mathiassen and Svahn (2014) conclude that in order for firms to realize the benefits of a digital strategy; then it needs to employ dynamic tools to support them in managing their digital innovation efforts.

Digital innovation strategy refers to the deliberate planning and implementation of novel digital technologies, processes, or business models to create value, gain a competitive advantage, or solve complex problems (Gul, & Ellahi, 2021). In general context, strategic digital innovation is defined as the creation of market offerings, business processes or models that result from the use of digital technology. Fichman et al., (2019) define digital innovation strategy as the use of a combination of information, computing, communication and connectivity technologies in the innovation process, including bringing new products, improving production processes, reforming organizational models and creating and changing business models. The outcome of a strategic digital innovation range from an introduction of new products, platforms initiated using a digitalized process and technologies, resulting in new products, platforms, services and new customer experiences. Consequently, digital innovations are innovative digital solutions that transform organizations' products, service and business. Nambisan et al. (2017) highlight that when initiating a digital strategy, it is necessary to align broader organization goals and objectives with the digital innovation strategy in order that the innovation efforts contributes to the overall business success. Similarly, when developing a digital business strategy, there is need to understand the market and industry trends with a view to identifying opportunities for digital innovation in relation to customer needs, competitor activities and emerging technologies. Digital innovation should focus on enhancing customer experience and addressing their pain points. Högberg and Willermark (2023) reinforce that user experience is a key component of digital innovation in terms of both usability issues and aesthetic properties of digital products and services.

Statement of the Problem

The manufacturing sector is a critical component of Kenya's economy, contributing significantly to employment, GDP, and export earnings. However, firms in Nairobi County, the industrial hub of the country, face numerous challenges including high operational costs, inefficient production processes, and stiff competition both locally and globally (Kanyangi & Gichinga, 2020). In recent years, digital innovation has emerged as a pivotal strategy for enhancing operational efficiency, reducing costs, and gaining competitive advantage. Despite its potential benefits, the adoption and integration of digital

innovation strategies among manufacturing firms in Nairobi remain uneven and relatively low (Yator & Kipchimba, 2022).

The manufacturing sector contributes approximately 10% to Kenya's GDP, employing around 300,000 people directly, with a larger number in the value chain. A survey by the Kenya Association of Manufacturers (KAM) in 2022 indicated that only about 35% of manufacturing firms in Nairobi had adopted digital technologies such as automation, data analytics, and cloud computing. According to the World Bank, manufacturing firms in Kenya could improve their productivity by 20-30% through the adoption of digital innovation strategies. The World Economic Forum's Global Competitiveness Report (2023) ranked Kenya 95th out of 141 countries, highlighting challenges in technological readiness and innovation capability. Data from the Kenya National Bureau of Statistics (KNBS) shows that firms that have integrated digital technologies report a 15% higher growth rate in market share compared to those that have not.

Various studies have been conducted on digital innovation strategy and organization performance. For instance; Yator and Kipchimba (2022) examined on the effect of digital innovation strategies on organization performance in the telecommunication industry in Kenya: a case of Safaricom Kenya. Kanyi and Kihara (2022) investigated on the influence of digital innovation strategies on performance of internet service provider companies in Nairobi Kenya. Njau and Kimencu (2022) conducted a study on digital innovation strategies and organizational performance of Kenya commercial bank branches in Nairobi City County, Kenya. Kanyangi and Gichinga (2020) researched on the effect of digital innovation strategies on the organizational performance in Mombasa law courts, Kenya. Nevertheless, none of these studies focused on performance of Manufacturing Firms in Nairobi County, Kenya. To fill the highlighted gaps, the current study sought to determine the effect of digital innovation strategy on performance of Manufacturing Firms in Nairobi County, Kenya.

General Objective of the Study

The general objective of the study was to determine the effect of digital innovation strategy on performance of Manufacturing Firms in Nairobi County, Kenya

Specific Objective of the Study

i. To assess the effect of process innovation on performance of manufacturing firms in Nairobi, Kenya
ii. To analyze the effect of Market innovations on performance of manufacturing firms in Nairobi, Kenya

Theoretical Review

Resource Dependency Theory

Resource Dependence Theory (RDT) founded by Pfeffer and Salancik (1978) is a theoretical framework in organizational studies that examines how organizations strategically manage and depend on external resources to achieve their goals and sustain their operations. RDT argues that organizations exist within an environment where they must interact with external entities such as suppliers, customers, competitors, government agencies, and other stakeholders. These external entities possess resources that are crucial for the organization's survival and success (Habimana, Mbarile & Mukankus, 2020). Central to RDT is the concept of resource dependency, which suggests that organizations are dependent on external resources that they cannot fully control. These resources include financial capital, technology, information, expertise, raw materials, market access, and political support, among others. The theory posits that the ability of an organization to secure and manage these external resources effectively influences its organizational behavior, decision-making processes, and strategic actions (Iherobiem & Sanusi, 2023).

Organizations employ various strategies to manage resource dependencies, including forming strategic alliances, diversifying suppliers, lobbying for favorable regulations, investing in technology, and engaging in networking activities. These strategies are aimed at reducing uncertainty, ensuring access to critical resources, and enhancing organizational resilience in a competitive environment. RDT also emphasizes power dynamics in resource exchanges between organizations and their external environment. Organizations with greater resource dependencies may find themselves in vulnerable positions if they lack alternatives or substitutes for essential resources (Kihiko, Yatich & Obuba, 2024). Conversely, organizations that successfully manage and diversify their resource dependencies can strengthen their competitive position and influence within their industry or market. Moreover, RDT highlights the role of inter-organizational relationships and networks in resource acquisition and management. Organizations often engage in strategic interactions with external stakeholders to negotiate resource exchanges, build trust-based partnerships, and gain access to complementary resources that contribute to their strategic objectives (Ahawo, 2021). This theory was relevant in assessing the effect of process innovation on performance of manufacturing firms in Nairobi, Kenya.

Potters Theory of Competitive Advantage

Potter's Theory of Competitive Advantage, often associated with the work of Michael Porter (1990), focuses on how firms can achieve and sustain a competitive edge in their respective industries. Porter's theory is primarily articulated through his seminal frameworks, such as the Value Chain Analysis and the Five Forces Model, which provide a structured approach to understanding competitive dynamics and strategic positioning. At the core of Porter's theory is the concept of competitive advantage, which he defines as the attributes or capabilities that allow a firm to outperform its rivals. Porter identifies two main types of competitive advantage: cost leadership and differentiation (Hanif, *et al*, 2020). Cost leadership involves a firm striving to become the lowest-cost producer in its industry, enabling it to offer products or services at a lower price than competitors while maintaining profitability. Differentiation, on the other hand, involves a firm offering unique products or services that provide added value to customers, allowing it to charge a premium price and stand out from competitors. Porter's Value Chain Analysis is a key component of his theory. It breaks down a company's activities into primary and support activities to analyze how they contribute to creating value and achieving a competitive advantage. Primary activities include inbound logistics, operations, outbound logistics, marketing and sales, and service, while support activities encompass firm infrastructure, human resource management, technology development, and procurement. By examining each activity, firms can identify areas where they can enhance efficiency, reduce costs, or create differentiation to improve their competitive position (Emumena & Hamilton, 2022).

Another critical aspect of Porter's theory is the Five Forces Model, which examines the competitive forces shaping an industry and influences a firm's ability to achieve and sustain competitive advantage. The five forces are: the threat of new entrants, the bargaining power of suppliers, the bargaining power of buyers, the threat of substitute products or services, and the intensity of competitive rivalry. By analyzing these forces, firms can better understand the structure of their industry and identify strategies to mitigate competitive pressures or capitalize on opportunities (Okundi & Muchemi, 2022). Porter's theory also emphasizes the importance of strategic positioning and the alignment of activities to support a chosen strategy. He argues that firms must make deliberate choices about their competitive approach and ensure that all aspects of their operations are aligned with their strategic objectives. This involves not only choosing between cost leadership and differentiation but also managing trade-offs and ensuring consistency across the organization (Idah & Egessa, 2023). This theory was relevant in analyzing the effect of market innovations on performance of manufacturing firms in Nairobi, Kenya.

Conceptual Framework

A conceptual framework is a structure that a researcher considers to represent progression of a natural phenomenon that is intended for study (Camp, 2019). A conceptual framework accentuates the worthiness

of a research topic to be studied, (Adom & Hussein, 2018). The framework shows a relationship between the independent (predictor) and dependent (outcome) variables. Figure 2.1 represents the conceptual Framework

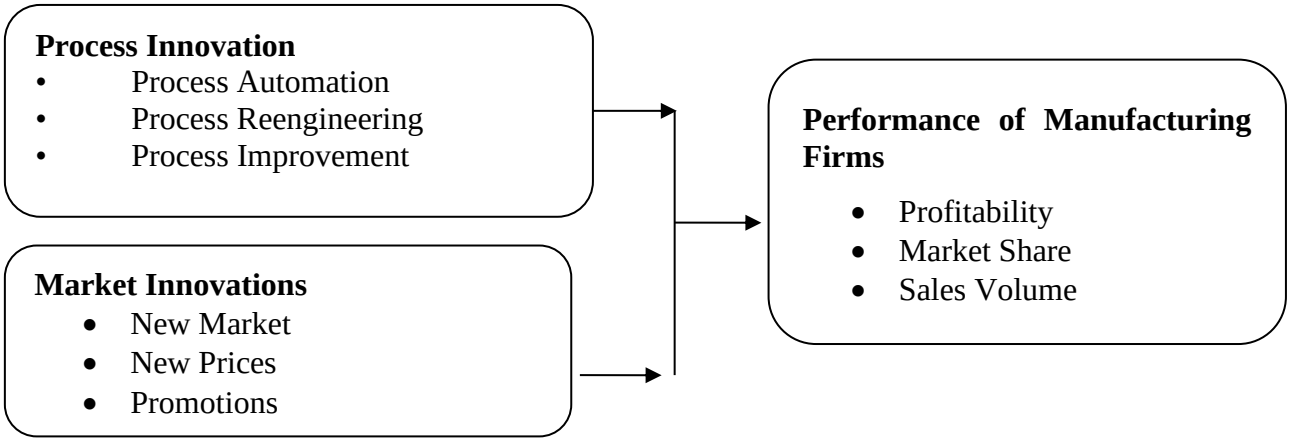

Figure 2. 1Conceptual framework

Process Innovation

Process innovation refers to the development and implementation of new or significantly improved methods for producing or delivering goods and services. This innovation focuses on enhancing the efficiency, effectiveness, and flexibility of operational processes within an organization. Process innovation aims to transform the way business operations are conducted (Ahawo, 2021). Process Automation involves using technology to perform tasks or processes that were previously done manually. The primary goal of process automation is to increase efficiency, reduce human error, and free up employees to focus on more strategic activities. Automation can range from simple tasks, like data entry, to complex processes, such as managing entire workflows. Technologies such as robotic process automation (RPA), artificial intelligence (AI), and machine learning play a significant role in this area. By automating repetitive and time-consuming tasks, organizations can achieve faster turnaround times, consistent output, and substantial cost savings, all while improving accuracy and compliance (Yego, Sang & Kibet, 2021).

Process Reengineering is a fundamental redesign of business processes to achieve dramatic improvements in performance measures such as cost, quality, service, and speed. This approach involves rethinking and radically restructuring existing processes to eliminate inefficiencies and align them more closely with business goals. Unlike incremental improvements, process reengineering typically involves a clean slate approach, questioning existing workflows and making significant changes to create more streamlined and effective processes. This might include redesigning workflows, integrating new technologies, or reassigning roles and responsibilities. The aim is to achieve breakthroughs in performance and create substantial gains in productivity and effectiveness (Habimana, Mbarile & Mukankus, 2020).

Process Improvement focuses on the continuous enhancement of existing processes to increase efficiency, effectiveness, and quality. This approach is generally less radical than process reengineering and involves iterative changes rather than complete overhauls. Process improvement methods often use tools and techniques such as Six Sigma, Lean, or Kaizen to identify and eliminate waste, reduce variability, and enhance overall process performance. The objective is to make gradual, incremental improvements that lead to better outcomes, higher customer satisfaction, and cost savings (Iherobiem & Sanusi, 2023).

Market Innovations

Market Innovations refer to the introduction of new or significantly improved products, services, or business models that create value by addressing unmet needs, leveraging new market opportunities, or transforming existing market dynamics. Market innovations are specifically oriented towards altering the way markets function or expanding into new markets (Mbogori & Moguche, 2021). New Market refers to the strategy of expanding into previously untapped or under-served geographic areas or demographic segments. Entering a new market involves identifying and analyzing potential opportunities where a company's products or services can meet unmet needs or provide added value. This expansion can involve geographical growth into new regions or countries or targeting different customer segments within existing markets. Successfully entering a new market often requires thorough market research to understand local preferences, regulatory requirements, and competitive landscapes. By diversifying into new markets, companies can mitigate risks associated with their current markets, enhance their growth potential, and leverage opportunities for increased revenue and brand presence (Hanif, *et al*, 2020).

New Prices encompass the adjustment of pricing strategies to better align with market conditions, customer expectations, or business goals. Introducing new pricing models can involve setting new price points, offering discounts, or implementing tiered pricing strategies. This can be driven by various factors such as changes in production costs, competitive pressures, or shifts in customer demand. For instance, companies might use promotional pricing to attract new customers or introduce premium pricing for enhanced features. Adjusting prices strategically can help a company optimize revenue, enhance competitiveness, and better meet the needs of different customer segments. Effective pricing strategies are crucial for maintaining market relevance and achieving financial objectives (Emumena & Hamilton, 2022).

Promotions are marketing activities designed to increase awareness, interest, and sales of a product or service. They can include a wide range of tactics such as discounts, special offers, advertising campaigns, or limited-time deals. Promotions aim to incentivize customers to make a purchase, boost brand visibility, and drive short-term sales. Effective promotions often leverage timing, relevance, and appeal to resonate with target audiences and stimulate demand. They can also be used to introduce new products, clear out inventory, or reward loyal customers. By carefully planning and executing promotions, companies can enhance their market presence, attract new customers, and foster stronger customer relationships (Okundi & Muchemi, 2022).

Empirical Review

Process Innovation and Firm Performance

Habimana, Mbarile and Mukankusi (2020) researched on the the effect of process innovation on the performance of banking sector in east Africa region perspectives. The research was designed under case study and used both descriptive and correlational statistics. The targeted population of the study was 324 employees of KCBR using simple random sampling approach, and then the sample size was 76 respondents determined using slovin’s formula and selected using stratified sampling technique. The study found that there is a positive and very high correlation between process innovation and banking sector performance. The study concluded that process innovation influences performance of banking sector.

Iherobiem and Sanusi (2023) assessed on the process innovation as a strategic tool in enhancing the performance of organizations: a study of manufacturing firms in Nigeria. . The study employed a descriptive survey methodology and population of the study consisted 7.533 employees from specifically 3 chosen manufacturing companies in Nigeria: Lafarge Africa Plc, Flour Mill Nigeria PLC and PZ Cussons. The sample size for the study was estimated using Andrew Fisher's Formula to be 366 and the distributed questionnaire was designed. The study found a substantial correlation between process

innovation and performance of organization. The study concluded that process innovation is important for improving organizational performance.

Kihiko, Yatich and Obuba (2024) investigated on evaluation of process innovation influence on performance of equity bank and Safaricom Plc in Kenya: a comparative analysis. a. Such tools as descriptive and cross-sectional designs were used with primary and secondary data collection instruments. The two companies received different number of questionnaires. The study found a positive and insignificant effect between process innovation strategy and performance for both entities, with Equity Bank having a stronger correlation. The study concluded that there is a statistically significant influence of process innovation strategy on performance of Equity Bank and Safaricom PLC in Kenya.

Ahawo (2021) examined on the process innovation and performance of nonprofit organizations in Kenya. The study adopted a descriptive cross sectional research design. The target population was the top and middle managers of humanitarian organizations in Kenya which were selected through random sampling. The study found a strong positive correlation between process innovation and performance of nonprofit organizations. The study concluded that process innovation is a good predictor of organization performance.

Yego, Sang and Kibet (2021) conducted a study on the effect of process innovations on performance of small and medium manufacturing enterprises in Nairobi County, Kenya. The research was conducted using a positivist approach and an explanatory research design. A representative sample of 254 managers or owner managers from manufacturing SMEs registered with the Kenya Association of Manufacturers was selected using a stratified random sampling technique. The study found that there was a significant positive relationship between process innovations and firm performance. The study concluded that process innovation has a significant impact on the performance of small and medium-sized manufacturing firms.

Market Innovations and Firm Performance

Hanif, *et al* (2020) conducted a study on the impact of market innovation and adoption on firm's performance. The power generation plants and petrochemical sector of Pakistan has been selected as the target population for research study. Data was collected through floating a survey questionnaire to the respondents. The study found that market innovation and firm performance are positively and significantly correlated. The study concluded that market innovation have positive impact on firm's performance.

Emumena and Hamilton (2022) investigated on the market innovation and performance of indigenous oil and gas companies in south-south, Nigeria. The study adopted the cross-sectional research survey design. Primary data was generated through structured questionnaire. The population of this study was thirty-three registered and functional indigenous oil and gas companies in South-South, Nigeria. In this stud the researcher adopted a census sampling technique to study all the 33 indigenous oil and gas companies in Rivers State because the population was small. The study found that there is a significant relationship between market innovation and performance of indigenous oil and gas companies in South-South, Nigeria. The study concluded that market innovation enhances the ventures into new markets and support better market shares.

Okundi and Muchemi (2022) examined on marketing innovation and entrepreneurial performance of small and medium enterprises in Nakuru East Town Sub-County. The study engaged a descriptive and explanatory research design that targeted 126 respondents who are 10 percent of the selected registered 1,259 SMEs in Nakuru East Town Sub-County. This study found that there is a strong positive and significant relationship between marketing innovation and entrepreneurial performance of SMEs in Nakuru East Town Sub-County. The study concluded that marketing innovation is statistically significant in its effect on entrepreneurial performance of SMEs in Nakuru East Town Sub-County.

Idah and Egessa (2023) assessed on market innovation and competitiveness of commercial banks in Kenya. Descriptive and correlational research designs were used. The target population consisted of 175 directors and general managers of tier one commercial banks in the following departments based in head office: Research and Development, Marketing and Communication, Customer Service, Credit and Payments. Banks were classified into tiers through stratified sampling. Managers were classified into directors and general manager levels. Simple random sampling was then employed to select 122 respondents. The study found that there was significant relationship between market innovation and competitiveness of Commercial Banks in Kenya. The study concluded that market innovation influenced the competitiveness of commercial banks in Kenya.

Mbogori and Moguche (2021) researched on the effect of market innovation on performance of the cement manufacturing firms in Kenya. It adopted descriptive research design. The target population was all the department heads in all the nine cement manufacturing firms. The total number of departments in all the firms was 79. All the 79 respondents were included in the study since the target population was small. The study found that market innovation positively and significantly affect performance of the cement manufacturing firms in Kenya. The study concluded that market innovations have a positive and significant effect on performance of the cement manufacturing companies in Kenya.

RESEARCH METHODOLOGY

Research Design

The study used descriptive survey design. Descriptive survey design is useful in describing the features of the population that has been earmarked for study and providing answers to the research questions as noted by Shields and Rangarajan (2019). The study adopted both quantitative and qualitative methods to investigate the connection between the significant study variables. According to Teddlie and Tashkkori, (2019) the two methods help in getting comparative data of the same kind. This was used to compute the hypothetical relationship amongst the dependent and independent variables because it requires the data to be transposed into numbers in a formal objective systematic process and obtain information describe variables and their relationships (Mark, Philip &Adrian, 2019, Nicholas, 2017, and William, 2019).

Target Population

The target population for this study was manufacturing companies in Nairobi County (World Bank economic update, 2020). According to Kenya Association of Manufacturers (KAM, 2022), there are 91 medium Food and beverage manufacturing companies in Nairobi County. These manufacturing firms were the unit of analysis while the management employees were the unit of observation. The object from which information is obtained is referred to as a unit of observation (Cooper & Schindler, 2019). Therefore, 546 managers in the 91 manufacturing companies were targeted.

Table 3. 1: Target Population

Category	Target Population
Top Managers	91
Middle Managers	182
Lower Level Managers	273
Total	**546**

Sample and Sampling Technique

Lavrakas (2019) postulates that sampling technique is the method used to identify a subset of relevant elements from the target population; thus in a case where the study collects too much data, it is considered

as being wasteful. According to Eric and Marko (2020) sampling is the process of selecting a few individuals for a study in such a way that the individual represents a larger group from which they are selected. A sample is a small group obtained from accessible population (Mugenda & Mugenda 2019). The Yamane formula was adopted to calculate the study sample size as follows;

$$n = \frac{N}{1+N(e^2)}$$

Where n is the sample size, and N is the population size, e- acceptable sampling error (0.05)

$$= \frac{546}{1+546(0.05^2)}$$

$$= \frac{546}{2.365} = 230.86$$

$n \approx 231$

Therefore, the study sample size was 231 respondents.

The stratified random sampling method was adopted to select the study sample size. Stratified random sampling is a method of sampling that involves the division of a population into smaller sub-groups known as strata. In stratified random sampling or stratification, the strata are formed based on members' shared attributes or characteristics such as income or educational attainment (Creswell, 2019).

Data Collection Instruments

This study relied on both primary and secondary data. The primary data was collected from the management employees in the firms using a semi structured questionnaire. A questionnaire is defined as a document that consists of a number of questions printed in a definite order or a form or a set of forms (Kothari, 2019). This study employed quantitative data collection method whereby data was gathered by use of close ended questionnaires this is because they work best with standardized questions that are interpreted the same way by all respondents (Coopers &Schindler, 2019).

The questionnaire is a research instrument based on different set of questions for the purpose of gathering information from the respondents across various fields (Kabir, 2019). Azer (2019) argues that questionnaires are a useful data gathering tool that provides a high degree of data standardization and adoption of generalized information amongst any population. They are typically designed to collect the data from a large number of respondents. Questionnaires are advantageous since they are comparatively easier to plan, construct and administer. It does not require much technical skill or knowledge. They are filled up by the respondents in their own comfort whereby the respondents can answer at their own pleasure, and they also facilitate the collection in large amount of data in a relatively short time (Malott & Kohler, 2021).

Pilot Study

A pilot test was conducted to determine validity and reliability of the data collection instrument. A pilot study is a small experiment designed to test logistics and gather information prior regarding a larger study, in order to improve the latter quality and efficiency. A pilot study can reveal deficiencies in the design of proposed experiment and procedure and these can be addressed before time and resources are expended on large scale studies. The responses from respondents were used to adjust and refine questionnaire

accordingly. According to Mugenda and Mugenda (2019) the pretest sample should be between 1% and 10% depending on the sample size. Therefore, 23 (10% of study sample) questionnaires were tested on manufacturing firms selected randomly.

Data Analysis and Presentation

Data obtained from the field was coded, cleaned, and entered into the computer for analysis using the SPSS version 25. The data was summarized in order to see emerging trends and issues around specific themes, which are dependent on the variables and objectives. Presentation of data was done in form of quantitative and qualitative reports which was presented in forms of tables and essay. For the quantitative reports, the tables consisted of mean and standard deviation values that were used to make interpretation of the analysis. Percentage, mean and standard deviation were used to show the frequency of responses. Tables were used to display the rate of responses and to facilitate comparison. Qualitative reports were presented in form of essay which was discussed as per the study objectives aligned with the theories and empirical study.

Descriptive statistics included frequency, percentages, mean and standard deviation. Inferential statistical analysis included multiple regression and correlation analysis. The significant of each independent variable was tested at a confidence level of 95%. The multiple regression model that was utilized.

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

Descriptive Statistics Analysis

Process Innovation and Firm Performance

The first specific objective of the study was to assess the effect of process innovation on performance of manufacturing firms in Nairobi, Kenya. The respondents were requested to indicate their level of agreement on the statements relating to process innovation and performance of manufacturing firms in Nairobi, Kenya. The results were as shown in Table 4.1.

From the results, the respondents agreed that their current process automation tools effectively streamline their operations (M=3.964, SD= 0.997). In addition, the respondents agreed that the implementation of process automation improves overall efficiency in their workflows (M=3.917, SD= 0.831). Further, the respondents agreed that the process reengineering efforts are aligned with their overall business strategy (M=3.858, SD=0.563).

From the results, the respondents agreed that employees are effectively involved in and informed about process reengineering projects (M=of 3.831, SD= 0.851). In addition, the respondents agreed that they have a systematic approach to identifying and implementing process improvements (M=3.751, SD= 0.935). Further, the respondents agreed that employees are encouraged to contribute ideas for process improvements (M=3.742, SD=0.692).

Table 4. 1: Process Innovation and Firm Performance

	Mean	Std. Deviation
Our current process automation tools effectively streamline our operations.	3.964	0.997
The implementation of process automation improves overall efficiency in our workflows.	3.917	0.831
The process reengineering efforts are aligned with our overall business strategy	3.858	0.563
Employees are effectively involved in and informed about process reengineering projects	3.831	0.851
We have a systematic approach to identifying and implementing process improvements.	3.751	0.935
Employees are encouraged to contribute ideas for process improvements.	3.742	0.692
Aggregate	**3.844**	**0.812**

Market Innovations and Firm Performance

The second specific objective of the study was to analyze the effect of Market innovations on performance of manufacturing firms in Nairobi, Kenya. The respondents were requested to indicate their level of agreement on various statements relating to Market innovations and performance of manufacturing firms in Nairobi, Kenya. The results were as presented in Table 4.2.

From the results, the respondents agreed that their strategy for entering new markets is effective in expanding their reach (M=3.943, SD= 0.981). In addition, the respondents agreed that they successfully identify and target new markets that align with their business goals (M=3.866, SD= 0.850). Further, the respondents agreed that the implementation of new pricing models is well-received by customers (M=3.731, SD= 0.914).

The respondents also agreed that their pricing adjustments leads to an increase in sales and market share (M=3.696, SD= 0.947). In addition, the respondents agreed that they utilize a variety of promotional channels to maximize reach and impact (M=3.689, SD= 0.856). Further the respondents agreed that promotional activities are well-coordinated and align with their brand messaging and objectives (M=3.671, SD=0.621).

Table 4. 2: Market Innovations and Firm Performance

	Mean	Std. Deviation
Our strategy for entering new markets is effective in expanding our reach	3.943	0.981
We successfully identify and target new markets that align with our business goals	3.866	0.850
The implementation of new pricing models is well-received by customers.	3.731	0.914
Our pricing adjustments leads to an increase in sales and market share.	3.696	0.947
We utilize a variety of promotional channels to maximize reach and impact	3.689	0.856
Promotional activities are well-coordinated and align with our brand messaging and objectives.	3.671	0.621
Aggregate	**3.766**	**0.862**

Correlation Analysis

The present study used Pearson correlation analysis to determine the strength of association between independent variables (process innovation and market innovations) and the dependent variable (performance of manufacturing firms in Nairobi, Kenya) dependent variable. Pearson correlation

coefficient range between zero and one, where by the strength of association increase with increase in the value of the correlation coefficients.

Table 4. 3: Correlation Coefficients

		Firm Performance	Process Innovation	Market Innovations
Firm Performance	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	211		
Process Innovation	Pearson Correlation	.842**	1	
	Sig. (2-tailed)	.002		
	N	211	211	
Market Innovations	Pearson Correlation	.910**	.179	1
	Sig. (2-tailed)	.000	.081	
	N	211	211	211

Moreover, the results revealed that there is a very strong relationship between process innovation and performance of manufacturing firms in Nairobi, Kenya (r = 0.842, p value =0.002). The relationship was significant since the p value 0.002 was less than 0.05 (significant level). The findings conform to the findings of Habimana, Mbarile and Mukankusi (2020) that there is a very strong relationship between process innovation and firm performance.

The results also revealed that there was a very strong relationship between market innovations and performance of manufacturing firms in Nairobi, Kenya (r = 0.910, p value =0.000). The relationship was significant since the p value 0.000 was less than 0.05 (significant level). The findings are in line with the results of Okundi and Muchemi (2022) who revealed that there is a very strong relationship between market innovations and firm performance

Regression Analysis

Multivariate regression analysis was used to assess the relationship between independent variables (process innovation, and market innovations) and the dependent variable (performance of manufacturing firms in Nairobi, Kenya)

Table 4. 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.868	.753	.754	.10120

The model summary was used to explain the variation in the dependent variable that could be explained by the independent variables. The r-squared for the relationship between the independent variables and the dependent variable was 0.753. This implied that 75.3% of the variation in the dependent variable (performance of manufacturing firms in Nairobi, Kenya) could be explained by independent variables (process innovation and market innovations).

Table 4.5: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.035	2	4.0175	62.78	.000b
	Residual	6.568	208	.032		
	Total	14.603	210			

The ANOVA was used to determine whether the model was a good fit for the data. F calculated was 62.78 while the F critical was 2.415. The p value was 0.000. Since the F-calculated was greater than the F-critical and the p value 0.000 was less than 0.05, the model was considered as a good fit for the data. Therefore, the model can be used to predict the influence of product innovation, process innovation, service innovation and market innovations on performance of manufacturing firms in Nairobi, Kenya.

Table 4.6: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	**(Constant)**	0.205	0.053		3.867	0.000
	process innovation	0.486	0.123	0.487	3.951	0.000
	market innovations	0.430	0.113	0.431	3.805	0.001

a Dependent Variable: performance of manufacturing firms in Nairobi, Kenya

The regression model was as follows:

$$\mathbf{Y = 0.205 + 0.486X_1 + 0.430X_2 + \varepsilon}$$

The results revealed that process innovation has significant effect on performance of manufacturing firms in Nairobi, Kenya, β1=0.486, p value= 0.000). The relationship was considered significant since the p value 0.000 was less than the significant level of 0.05. The findings conform to the findings of Habimana, Mbarile and Mukankusi (2020) that there is a very strong relationship between process innovation and firm performance.

In addition, the results revealed that market innovations has significant effect on performance of manufacturing firms in Nairobi, Kenya β1=0.430, p value= 0.001). The relationship was considered significant since the p value 0.001 was less than the significant level of 0.05. The findings are in line with the results of Okundi and Muchemi (2022) who revealed that there is a very strong relationship between market innovations and firm performance.

Conclusions

The study concludes that process innovation has a positive and significant effect on performance of manufacturing firms in Nairobi, Kenya. Findings revealed that process automation, process reengineering and process improvement influences performance of manufacturing firms in Nairobi, Kenya.

The study also concludes that market innovations have a positive and significant effect on performance of manufacturing firms in Nairobi, Kenya. Findings revealed that new market, new prices and promotions influence performance of manufacturing firms in Nairobi, Kenya.

Recommendations

The study recommends that the management of manufacturing firms in Kenya should implement advanced automation technologies. By incorporating automation into production processes, firms can achieve greater efficiency, reduce error rates, and lower labor costs. Automation tools, such as robotic systems and smart sensors, can streamline operations, enhance precision, and accelerate production timelines.

The study also recommends that the management of manufacturing firms in Kenya should explore niche market segments and localized products. By identifying and targeting specific, underserved segments within the local market—such as products tailored to regional preferences or solutions addressing unique local challenges—firms can differentiate themselves from larger competitors and capture dedicated customer bases.

REFERENCES

Agustian, K., Mubarok, E. S., Zen, A., Wiwin, W., & Malik, A. J. (2023). The impact of digital transformation on business models and competitive advantage. *Technology and Society Perspectives (TACIT), 1*(2), 79–93.

Ahawo, R. O. (2021). Process innovation and performance of nonprofit organizations in Kenya. *The Strategic Journal of Business & Change Management, 8*(1), 18–27.

Akinwale, Y.O., Adepoju, A.O. and Olomu, M.O. (2017) 'The impact of technological innovation on SME's profitability in Nigeria', Int. J. Research, Innovation and Commercialisation, Vol. 1, No. 1, pp.74–92.

Alipour, M., & Harris, D. K. (2020). A big data analytics strategy for scalable urban infrastructure condition assessment using semi-supervised multi-transform self-training. *Journal of Civil Structural Health Monitoring, 10*(2), 313-332.

Chege, S. M., Wang, D., & Suntu, S. L. (2020). Impact of information technology innovation on firm performance in Kenya. *Information Technology for Development, 26*(2), 316-345.

Chi, M., Lu, X., Zhao, J., & Li, Y. (2018). The impacts of digital business strategy on firm performance: The mediation analysis of e-collaboration capability. *International Journal of Information Systems and Change Management, 10*(2), 123-139

Davis, G. F., & Cobb, J. A. (2015). Resource dependence theory: Past and future. *Stanford's organization theory renaissance, 1970–2000*

Emumena, D. E & Hamilton, D. I. (2022). Market innovation and performance of indigenous oil and gas companies in south-south, Nigeria. *Journal of Strategic Management, 6*(6), 63-76.

Fraj, E., Matute, J., & Melero, I. (2015). Environmental strategies and organizational competitiveness in the hotel industry: The role of learning and innovation as determinants of environmental success. Tourism management, 46, 30-42

Frynas, J. G., & Yamahaki, C. (2016). Corporate social responsibility: Review and roadmap of theoretical perspectives. *Business Ethics: A European Review*, 25(3), 258-285

Hartono, H. and Halim, E. (2020). The effect of digital capability on competitiveness through digital innovation of E-travel business in Indonesia, 2020 International Conference on Information Management and Technology (ICIMTech), IEEE, pp. 615-620

Henfridsson, O., Mathiassen, L., & Svahn, F. (2014). Managing technological change in the digital age: the role of architectural frames. *Journal of Information Technology, 29*, 27-43.

Ihenyen, C. J, Ayakoroma, M & Kojo, P. B. (2023). Impact of digital innovation strategies on Nigeria business growth. *International Journal of Advanced Multidisciplinary Research and Studies, 3*(3), 18-23.

Khattak, A., Tabash, M. I., Yousaf, Z., Radulescu, M., Nassani, A. A., & Haffar, M. (2022). Towards innovation performance of SMEs: investigating the role of digital platforms, innovation culture

and frugal innovation in emerging economies. *Journal of Entrepreneurship in Emerging Economies*, *14*(5), 796-811.

Kihiko, M. K, Yatich, H & Obuba, R. O. (2024). Evaluation of process innovation influence on performance of equity bank and Safaricom Plc in Kenya: a comparative analysis. *International Journal of Management, Accounting and Economics*, *11*(5), 520-536.

Kuguru, P. N, Jeansso, J & Nganga, K. (2022). Influence of product innovation on the performance of coffee cooperatives in Kenya. *European Journal of Business and Strategic Management, 7*(2), 61-71.

Nduati, L. N. (2023). *Innovation Strategies, Entrepreneurial Orientation and Performance of Data Service Providers in Kenya* (Doctoral dissertation, JKUAT-COHRED).

Njau, S. K & Kimencu, L. (2022). Digital innovation and organizational performance of Kenya commercial bank branches in Nairobi City County, Kenya. *International Journal of Scientific and Research Publications*, *12*(8), 427-433.

Shah, N, Zehri, A. W, Abdelwahed, N. A. A & Soomro, B. A. (2023). The role of digital innovation strategies towards firm performance in a digital economy. *Emerald Insight, 53*(2), 621-644.

Shah, N., Zehri, A. W., Saraih, U. N., Abdelwahed, N. A. A., & Soomro, B. A. (2024). The role of digital technology and digital innovation towards firm performance in a digital economy. *Kybernetes*, *53*(2), 620-644.

Walsh, J.P., Lee, Y.N. & Nagaoka, S. (2016). Openness and innovation in the us: collaboration form, idea generation and implementation, *Research Policy*, 45 (8), 1660-1671

Wang, K., Li, H., Feng, Y., & Tian, G. (2017). Big data analytics for system stability evaluation strategy in the energy Internet. *IEEE Transactions on Industrial Informatics*, *13*(4), 1969-1978.

Wang, L & Yan, J. (2023). Effect of digital innovation strategies on innovation performance in China: corporate social responsibility as a moderator. Retrieved from, file:///C:/Users/user/Downloads/.

Wang, P. (2021). Connecting the parts with the whole: toward an information ecology theory of digital innovation ecosystems", Mis Quarterly, 45(1), 397-422.

Yego, K. C, Sang, J & Kibet, Y. (2021). Effect of process innovations on performance of small and medium manufacturing enterprises in Nairobi County, Kenya. *African Journal of Education, Science and Technology*, *6*(4), 88-101.

Zaky, A. H. M. (2017). Determinate customer relationship management (crm) and its effects on sustaining competitive advantage in the Egyptian banking sector. *The Business And Management Review*, *8*(5), 266-275

Zulkiffli, S. N. A., & Perera, N. (2019). A literature analysis on business performance for SMEs: Subjective or objective measures?. In *Society of Interdisciplinary Business Research (SIBR) 2011 Conference on Interdisciplinary Business Research*.