



SUPPLY CHAIN INNOVATION STRATEGIES AND PERFORMANCE OF FOOD AND BEVERAGES MANUFACTURING FIRMS IN NAIROBI CITY COUNTY, KENYA

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ABSTRACT

Food manufacturing companies in Kenya have been experiencing fluctuations in profitability in their production and inventory management. The food manufacturing sector recorded a significant drop in growth from 4.7% to 1.6% and 2.7% to 0.2% respectively according to the World Bank economic update 2022. The general objective of this study was to determine the effect of Supply chain innovation strategies on performance of food and beverages manufacturing firms in Nairobi City County, Kenya. Specifically, the study sought to find out the influence of technological strategies on performance of food and beverages manufacturing firms in Nairobi City County, Kenya and to explore the effect of improvement strategies on performance of food and beverages manufacturing firms in Nairobi City County, Kenya. The study used descriptive survey design. The food and beverages manufacturing firms in Nairobi City County were the unit of analysis while the management employees were the 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. Data was collected using self-administered structured questionnaire. Descriptive statistical analysis included frequency, percentages, mean and standard deviation and were used to analyze quantitative data. SPSS version 25 was used for analysis. Inferential statistical analysis used were multiple regression and correlation analysis and tested the relationship between the study variables. The findings were displayed in tables and figures. The study found that all supply chain innovation strategies—technological strategies, and improvement strategies—significantly enhance the performance of food and beverages manufacturing firms in Nairobi City County, Kenya. Multiple regression analysis revealed that technological strategies had the strongest impact on firm performance ($\beta = 0.314$, $p = 0.000$), followed by improvement strategies ($\beta = 0.301$, $p = 0.000$). The study concludes that effective implementation of these strategies is crucial for improving operational efficiency, product quality, and overall firm success. Technological strategies, in particular, play a pivotal role in driving firm performance. Firms should prioritize technological advancements, continuous process improvement strategies to enhance performance.

Key Words: Supply Chain Innovation Strategies, Technological Strategies, Improvement Strategies Performance, Food and Beverages Manufacturing Firms

Background of the study

Manufacturing firms play a crucial global role across multiple dimensions, impacting economies, societies, and global trade in significant ways. Economically, they are major contributors, generating employment across various skill levels, providing stable incomes, and contributing significantly to tax revenues (Ojiambo & Kinyua, 2022). The manufacturing sector stimulates demand in related industries such as logistics, raw materials, and services, thereby fostering economic growth and development on both national and global scales. Moreover, manufacturing firms often drive infrastructure development, especially in emerging economies. They invest in physical infrastructure such as factories, warehouses, and transportation networks, as well as in human capital through training and skills development. This capacity building enhances local capabilities, supports industrialization efforts, and contributes to sustainable economic development by creating opportunities for employment and economic diversification (Iqbal et al, 2022).

The declining performance of manufacturing firms globally is a complex phenomenon influenced by a convergence of economic, technological, and geopolitical factors. Economically, global manufacturing output growth has experienced slowdowns, with statistics from organizations like the UNIDO indicating a notable deceleration from previous years (Okongo, Riungi & Nzioki, 2024). Events such as the global financial crisis and more recently, the COVID-19 pandemic, have disrupted supply chains, dampened consumer demand, and constrained investment in manufacturing expansion and modernization. Technological advancements, particularly automation, have reshaped manufacturing landscapes worldwide. Reports from McKinsey highlight significant potential job displacements due to automation, particularly impacting traditional manufacturing roles. While these advancements enhance productivity and efficiency, they also contribute to reduced labor demand and workforce restructuring challenges within the sector (Ahawo, 2021).

Supply chain innovation strategies encompass a variety of approaches aimed at enhancing efficiency, reducing costs, and improving customer satisfaction. Technological strategies play a crucial role in transforming supply chain operations through advanced technologies. Technologies such as Internet of Things (IoT) enable real-time tracking of goods and predictive maintenance, while blockchain ensures transparency and security in transactions. Artificial Intelligence (AI) and Machine Learning optimize demand forecasting and route optimization, while robotics and automation streamline warehouse and logistics operations. These technological innovations not only improve efficiency but also enable businesses to make data-driven decisions and enhance overall supply chain performance (Mukeshimana, Nkechi & Jefferson, 2020). Continuous improvement strategies are essential for sustaining supply chain innovation efforts over time. These strategies focus on ongoing improvement initiatives such as Kaizen (continuous improvement), Total Quality Management (TQM) for enhancing product quality, and supply chain resilience to mitigate risks and disruptions. Sustainability initiatives integrate environmental considerations into supply chain operations, promoting sustainable practices and reducing carbon footprints (Mushtaq, et al, 2023). Effective implementation of these improvement strategies requires strong leadership commitment, collaboration across functions, and robust measurement and evaluation systems to track progress and identify areas for further enhancement (Kpurunee, Amadi & Kpurunee, 2023)

Statement of the Problem

Despite importance of food manufacturing industry in Kenya, it has been experiencing a lot of turbulence in the recent past including a drop in the GDP, an increasing imbalance of trade and the exiting of large multinationals (Magutu, Aduda & Nyaoga, 2019). In addition to that, food manufacturing companies in Kenya have been experiencing fluctuations in profitability in their production and inventory management (KAM Directory, 2019). The food manufacturing sector

recorded a significant drop in growth from 4.7% to 1.6% and 2.7% to 0.2% respectively according to the World Bank economic update 2022. Further to this, there was a declining growth of agricultural real value-added from 5.2% in 2016 to 1.6% in 2017 (World Bank economic update, 2019). According to Kenya National Bureau of Statistics (KNBS) Economic Survey report of 2022, there has been a tremendous increase in the quantity of manufactured and processed food products by 3.1 per cent in the year 2021 compared to a growth of 5.6 per cent in 2020.

The growth was mainly driven by processing of sugar, meat and meat products, dairy products and bakery products. However, prepared and preserved fruits and vegetables, and animal and vegetable fats and oils registered negative growths in the same period. Production of meat and meat products recorded a 13.1 per cent growth, while dairy production registered a 10.8 per cent growth in 2021, compared to a slump of 6.7 per cent in 2020. The grain milling subsector grew by 6.2 per cent in 2021 compared to 11.7 per cent the previous year as the beverages and tobacco sector showed a 9.2 per cent growth (KNBS, 2022). According to a recent report from ING, technological development helps food manufacturers produce more efficiently for a growing world population. According to TechCrunch (2019), Supply chain innovation strategies influences organization performance.

Various studies have been conducted on Supply chain innovation strategies and organization performance. For instance; Wanjiku and Mwangangi, (2019) conducted a study on the influence of procurement best practices on the performance of food and beverage manufacturing firms in Kenya, Nabiliki, Wanyoike, and Mbeche, (2018) focused on the influence of supplier development practices on procurement performance in food and beverage manufacturing firms in Nakuru East Sub - County, Kenya and Kioko, and Were, (2018) conducted a study on the factors affecting efficiency of the procurement function at the public institutions in Kenya. Nevertheless, none of these studies focused on Supply chain innovation strategies and performance of food and beverage industry in Nairobi County Kenya. To fill the highlighted gaps, the current study seeks to establish the influence of Supply chain innovation strategies on performance of food and beverage industry in Nairobi County Kenya.

Objectives of the Study

The general objective of this study was to determine the effect of Supply chain innovation strategies on performance of food and beverages manufacturing firms in Nairobi City County, Kenya.

The study was guided by the following specific objectives;

- i. To find out the influence of technological strategies on performance of food and beverages manufacturing firms in Nairobi City County, Kenya.
- ii. To explore the effect of improvement strategies on performance of food and beverages manufacturing firms in Nairobi City County, Kenya.

LITERATURE REVIEW

Theoretical Review

Resource-Based View theory

The Resource-Based View (RBV) theory founded by Barney (1991) is a strategic management framework that focuses on the internal resources and capabilities of a firm as sources of competitive advantage. At its core, RBV posits that a firm's unique bundle of resources and capabilities can enable it to achieve sustainable competitive advantage and superior performance in the marketplace. Unlike traditional strategic management approaches that primarily focus on external factors such as market dynamics and industry structure, RBV emphasizes the importance of internal factors in determining a firm's success. RBV theory

entails identifying and leveraging a firm's distinctive resources and capabilities to create value and achieve strategic objectives. Resources can include tangible assets such as physical infrastructure, financial capital, and technology, as well as intangible assets such as human capital, intellectual property, organizational culture, and reputation. These resources are considered valuable if they enable the firm to exploit opportunities or neutralize threats in the external environment. Capabilities, on the other hand, refer to the firm's ability to effectively deploy and utilize its resources to perform specific activities and achieve desired outcomes (Mushtaq, *et al*, 2023).

The Resource-Based View (RBV) theory of strategic management is built upon several foundational assumptions that shape its approach to analyzing firm performance and competitive advantage. One key assumption of RBV is that firms are heterogeneous in terms of the resources and capabilities they possess. This means that each firm has a unique bundle of resources—both tangible and intangible—that is valuable, rare, difficult to imitate, and non-substitutable (VRIN). RBV posits that these distinctive resources and capabilities are the primary sources of sustained competitive advantage and superior performance. Another assumption of RBV is that firms are rational and profit-maximizing actors that seek to exploit their resources and capabilities to create value for stakeholders. RBV theory also assumes that resources are not static, but can be developed, accumulated, and leveraged over time to enhance a firm's competitive position. This implies that firms can invest in building and renewing their resource base, as well as developing dynamic capabilities that enable them to adapt and respond effectively to changes in the external environment. Additionally, RBV assumes that markets are imperfect and that firms can earn economic rents by possessing unique resources and capabilities that are not fully captured by market prices. These rents can arise from factors such as brand reputation, customer loyalty, and proprietary technology (Akinde & Bako, 2020).

Despite its strengths, RBV theory has faced several critiques over the years. One criticism is that RBV may be tautological or circular in its reasoning, as the concept of valuable, rare, inimitable, and non-substitutable resources (VRIN) is somewhat subjective and difficult to operationalize empirically. Critics argue that firms may achieve competitive advantage through factors other than resources and capabilities, such as market positioning or network effects. Additionally, RBV has been criticized for its limited focus on external factors and industry dynamics, such as changes in customer preferences, technological innovation, and competitive rivalry. Some scholars argue that RBV may overlook the importance of these external factors in shaping a firm's competitive position and performance. Moreover, RBV theory has been criticized for its lack of prescriptive guidance on how firms can identify and develop valuable resources and capabilities. While RBV provides a useful framework for understanding the sources of competitive advantage, it offers limited practical guidance on how firms can systematically analyze their resource base and make strategic decisions to enhance their competitive position. Critics also point out that RBV may be less relevant in industries characterized by rapid technological change and disruptive innovation, where traditional sources of competitive advantage may be short-lived (Mutie, Kariuki & Namusonge, 2020). This theory is relevant in finding out the influence of technological strategies on performance of food and beverages manufacturing firms in Nairobi City County, Kenya.

Dynamic Capability Theory

Dynamic Capability Theory developed by David Teece, Gary Pisano, and Amy Shuen (1997) represents a pivotal framework in strategic management, particularly emphasizing how firms can adapt and innovate in dynamic and competitive environments. Unlike traditional views that focus on static resources or core competencies as the source of sustained competitive advantage, Dynamic Capability Theory underscores the importance of a firm's ability to sense, seize, and reconfigure its resources and capabilities over time. Central to this theory is the

concept of sensing, which involves the capacity of firms to perceive changes and opportunities in their external environment. This entails actively monitoring market trends, customer behaviors, technological advancements, and competitive actions. For food and beverages manufacturing firms in Nairobi City County, effective sensing capabilities might involve continuous market research, consumer surveys, and competitor analysis to stay abreast of evolving consumer preferences and industry dynamics (Khan, Ali & Hongqi, 2021).

Once opportunities or threats are identified through sensing, the theory emphasizes the process of seizing. This step requires firms to make timely decisions and mobilize resources to capitalize on emerging opportunities or respond effectively to competitive challenges. In the context of Nairobi's food and beverages sector, seizing opportunities could mean swiftly launching new products, entering new markets, or forging strategic partnerships that align with changing consumer demands or regulatory shifts. Furthermore, Dynamic Capability Theory highlights the critical role of reconfiguring resources and capabilities. This involves integrating new knowledge, technologies, or operational processes into the firm's existing framework while adjusting or realigning current resources as needed. For instance, food manufacturing firms in Nairobi might reconfigure their production systems, supply chain networks, or distribution channels to enhance efficiency, improve product quality, or reduce environmental impact, thereby maintaining competitiveness in a rapidly evolving market (Nwatu (2024).

One fundamental assumption of Dynamic Capability Theory is that firms possess the ability to dynamically adjust and reconfigure their resources and capabilities in response to changing external environments. This assumes that firms have the organizational agility and learning capacity to sense emerging opportunities or threats, seize them effectively, and then reconfigure their internal resources to capitalize on these changes. This assumption implies that all firms have the inherent capability to adapt, innovate, and sustain competitive advantage over time (Kegoro & Anyango, 2020).

Critiques of Dynamic Capability Theory primarily focus on its conceptualization and practical implementation. One critique is that the theory tends to be ambiguous and difficult to operationalize in practice. The processes of sensing, seizing, and reconfiguring are complex and multidimensional, making it challenging for firms to clearly define and measure their dynamic capabilities. This ambiguity can hinder firms' ability to develop actionable strategies based on the theory's principles. Moreover, there is criticism regarding the assumption that dynamic capabilities are rare and valuable sources of sustained competitive advantage. Critics argue that in many industries, particularly those characterized by rapid technological change and intense competition, dynamic capabilities may be necessary for survival rather than sources of exceptional performance. This challenges the theory's assertion that firms with superior dynamic capabilities consistently outperform their peers over the long term (Kuria & Were, 2020).

Another critique relates to the theory's focus on internal organizational processes at the expense of external factors. Dynamic Capability Theory often places less emphasis on how external factors such as market structures, regulatory environments, and industry dynamics influence a firm's ability to develop and deploy dynamic capabilities. This limited focus may overlook critical external forces that shape competitive advantage and performance outcomes. Additionally, there is debate about the transferability of dynamic capabilities across different contexts and industries. Critics argue that what constitutes effective dynamic capabilities may vary significantly depending on factors such as industry structure, market conditions, organizational culture, and leadership style. This raises questions about the universality of Dynamic Capability Theory's prescriptions and its applicability across diverse business environments (Njoroge & Nyaga, 2022). This theory is relevant in exploring the effect of

improvement strategies on performance of food and beverages manufacturing firms in Nairobi City County, Kenya

Conceptual Framework

Conceptual framework highlights the independent and dependent variables and shows their interaction with each other. The independent variables include; technological strategies and improvement strategies while the dependent variable is performance of food and beverages manufacturing firms in Nairobi City County, Kenya. The conceptual framework for this study is presented in figure 1 below;

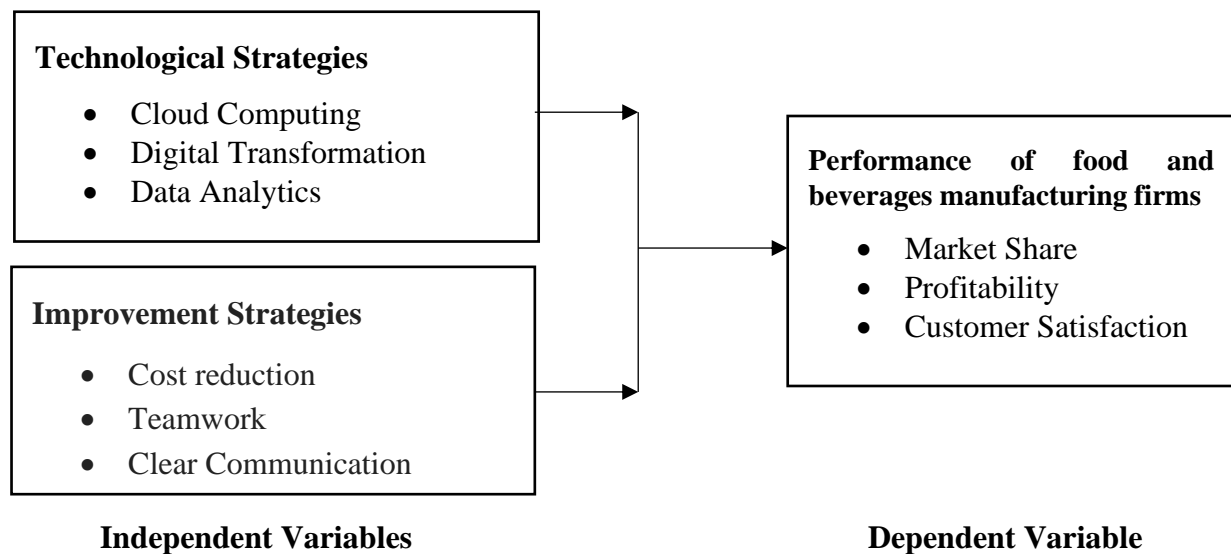


Figure 2. 1: Conceptual Framework

Technological Strategies

Technological strategies refer to the deliberate plans and actions that organizations adopt to leverage technology effectively in pursuit of their business objectives and competitive advantage (Mwende & Makokha, 2023). These strategies encompass the identification, adoption, integration, and utilization of technological innovations, tools, and systems to enhance operational efficiency, drive innovation, improve customer experience, and achieve sustainable growth (Kihara, Bwisa & Kihoro, 2020).

Cloud computing refers to the delivery of computing services—including servers, storage, databases, networking, software, and analytics—over the internet ("the cloud") rather than through on-premises hardware or local servers. Cloud computing offers organizations scalable and flexible access to resources on a pay-as-you-go basis, enabling them to rapidly deploy applications, scale infrastructure according to demand, and reduce the costs and complexities associated with managing physical hardware. Cloud computing models include Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS), each offering varying degrees of control and management by the organization or service provider. Benefits of cloud computing include improved agility, enhanced collaboration, better data security, and the ability to leverage advanced technologies such as AI, machine learning, and big data analytics (Mushtaq, *et al*, 2023).

Digital transformation refers to the strategic adoption and integration of digital technologies to fundamentally change how organizations operate and deliver value to customers. It involves leveraging digital technologies such as cloud computing, data analytics, AI, IoT, and automation to optimize processes, enhance customer experiences, and drive business growth.

Digital transformation initiatives typically aim to streamline operations, improve decision-making through data-driven insights, and create new revenue streams by innovating products and services. Successful digital transformation requires a cultural shift towards embracing innovation, agility, and continuous learning across the organization. It involves rethinking business models, redesigning customer journeys, and empowering employees with digital tools and skills to adapt to digital disruption and capitalize on emerging opportunities in a competitive marketplace (Akinde & Bako, 2020).

Data analytics involves the process of examining large datasets to uncover meaningful patterns, correlations, and insights that inform business decisions and strategies. Data analytics encompasses various techniques and methodologies, including descriptive analytics (summarizing historical data), diagnostic analytics (identifying reasons for past outcomes), predictive analytics (forecasting future trends), and prescriptive analytics (suggesting actions based on analysis). Organizations use data analytics to gain actionable insights into customer behavior, market trends, operational performance, and risk management. Advanced analytics techniques, such as machine learning and artificial intelligence, enable organizations to automate decision-making processes, personalize customer experiences, optimize supply chain operations, and mitigate risks proactively. Data-driven decision-making facilitated by robust data analytics capabilities empowers organizations to improve efficiency, reduce costs, innovate faster, and maintain a competitive edge in today's data-driven economy (Mutie, Kariuki & Namusonge, 2020).

Improvement Strategies

Improvement strategies refer to systematic approaches and methodologies adopted by organizations to enhance their performance, efficiency, quality, and overall effectiveness in achieving business objectives (Khan, Ali & Hongqi, 2021). These strategies focus on identifying areas for enhancement, implementing targeted actions, and continuously monitoring progress to drive sustainable improvements across various facets of operations (Nwatu (2024).

Cost reduction initiatives involve systematic efforts to decrease expenses and optimize resource allocation within an organization. These efforts are essential for improving profitability, efficiency, and competitiveness in the marketplace. Cost reduction strategies typically include identifying and eliminating unnecessary expenses, renegotiating contracts with suppliers to obtain better terms, optimizing operational processes to reduce waste and inefficiencies, and leveraging technology to automate tasks and reduce labor costs. Organizations may also explore strategic sourcing, value engineering, and energy efficiency measures to achieve sustainable cost savings. Effective cost reduction requires careful analysis of cost structures, collaboration across departments, and commitment from leadership to prioritize efficiency and financial discipline without compromising product quality or customer satisfaction (Kegoro & Anyango, 2020).

Teamwork refers to collaborative efforts among individuals or groups within an organization to achieve shared goals, solve problems, and deliver results. Effective teamwork is characterized by open communication, mutual respect, accountability, and a shared commitment to success. Organizations that foster teamwork encourage employees to collaborate across functional boundaries, leverage diverse perspectives and skills, and support each other to achieve collective objectives. Teamwork enhances productivity, innovation, and employee morale by promoting a sense of belonging, cooperation, and camaraderie among team members. It also enables organizations to tackle complex challenges, adapt to change more effectively, and capitalize on opportunities for growth and development. Strong teamwork is cultivated through effective leadership, clear roles and responsibilities, continuous feedback, and recognition of individual contributions to team success (Kuria & Were, 2020).

Clear communication is fundamental to effective organizational functioning and interpersonal relationships. It involves conveying information, ideas, expectations, and feedback in a concise, understandable, and timely manner to ensure mutual understanding and alignment. Clear communication facilitates collaboration, decision-making, and problem-solving by reducing misunderstandings, clarifying expectations, and fostering transparency. Organizations that prioritize clear communication establish channels for sharing information vertically and horizontally across departments and levels of hierarchy. This includes regular team meetings, email communications, virtual platforms, and formal presentations to disseminate updates, discuss goals, and address challenges. Clear communication also encompasses active listening, asking clarifying questions, and providing constructive feedback to enhance mutual comprehension and promote a positive and productive work environment (Njoroge & Nyaga, 2022).

Performance of Food and Beverages Manufacturing Firms in Nairobi city county, Kenya

According to Momiwand & Shahin, (2012) the basic goals of performance management are to improve Performance, reduce costs and minimize risk. A good performance management solution provides a reliable performance metrics. Cost Reduction use one supplier; you are eliminating competition for your orders. Find several suppliers who compete on price, and use several of them at all times so you can avoid costly delays in receiving products. Using multiple suppliers protects you from spending money for less-than-satisfactory service. In addition, if there's no approval process and individuals have the power to order supplies whenever they want, you could be ordering things you don't need. Examine your ordering process to see if it is causing waste (Sriram & Stump 2012).

Performance refers to an analysis of a company's achievements in relation to its objectives and goals. It is a measure of how well an organization is fulfilling its primary purpose, often through comparing actual results to planned or expected outcomes (Ahmad, Shahzad & Aftab, 2023). According to Um (2017), organizational performance is the result of management effectiveness, which is measured by how well managers achieve the objectives of the organization. It involves the accomplishment of the organization's mission, goals, and strategic objectives. Alfalla-Luque, García and Marin-García (2023) observed that organizational performance is the ability of an organization to achieve its desired outcomes, as reflected in its financial performance, customer satisfaction, internal processes, and learning and growth capabilities. Panigrahi, Meher and Shrivastava (2023) define organizational performance as a complex and multifaceted concept that encompasses the achievement of both short-term and long-term goals, as well as the organization's ability to adapt to changes in its environment and to learn and innovate over time. Key metrics of performance food and beverage manufacturing firms include profitability, sales growth, and market share.

Sales growth serves as the dynamic pulse of a company's revenue trajectory, representing the pace at which its income escalates over defined intervals, typically gauged quarterly or annually. This metric stands as a pivotal gauge of organizational vigor and competitive vigor within the market ecosystem (Rugabuka, 2022). In the intricate realm of food and beverage manufacturing firms, robust sales growth not only signifies commercial prowess but also unlocks avenues for customer expansion, product innovation, market diversification, and competitive edge attainment. At its core, sales growth encapsulates the essence of organizational vitality, reflecting the company's ability to captivate and retain a growing clientele while capitalizing on emerging market opportunities (Usman, 2023). It is not merely a numerical indicator but a barometer of market resonance and consumer demand dynamics. Firms experiencing substantial sales growth often wield the capacity to seize untapped market segments, introduce innovative products, and assert their presence across diverse geographical landscapes.

Empirical Review

Technological Strategies

Mushtaq, *et al* (2023) assessed on digital transformation and its impact on business performance in SMES of Pakistan: an empirical study. A stratified random sampling approach was employed to collect data from managers and employees across various Pakistani SMEs. The study found a significant positive correlation between the elements of digital transformation and business performance. The study concluded that SMEs embracing technological advancements, fostering digital literacy in management, and investing in digital infrastructure demonstrate improved operational efficiency and market adaptability.

Akinde and Bako (2020) investigated on technological strategies and organizational performance. A descriptive survey design was adopted for this study. A sample size of 96 employees in the study area was conveniently selected by the researcher to aid effective result. The study found that technological strategies have positive relationship with organizational performance. The study concluded that technological strategies have a significant effect on organizational performance.

Mutie, Kariuki and Namusonge (2020) examined on the influence of technological strategies on organizational performance of county governments in Kenya. This study made use of descriptive and quantitative research designs and the total sample size was 210 respondents. The study found that technological strategies have a positive impact on the organizational performance of county governments. The study concluded that technological strategies have a positive significant influence on county governments' organizational performance in Kenya.

Mwende and Makokha (2023) conducted a study on technological strategies and organizational performance of Machakos County Government Kenya. The study used a descriptive research design with a target population of 72 heads of departments in the county government of Machakos. The study found that technological strategies are positively related to organizational performance of Machakos County Government Kenya. The study concluded that technological strategies affect organizational performance of Machakos County Government Kenya.

Kihara, Bwisa and Kihoro (2020) researched on the role of technological strategies and performance of manufacturing small and medium firms in Thika, Kenya. A self-administered questionnaire was used to collect data from a sample of 115 firms out of a population of 165 manufacturing SME's from two key industrial subsectors in Thika Sub-County in Kenya. The study found that there is a strong positive and significant relationship between technological strategies and the performance of SME manufacturing firms. The study concluded that technological strategies influences performance in the manufacturing SME's in Kenya.

Improvement Strategies

Khan, Ali and Hongqi (2021) investigated on the impact of continuous improvement on organization performance insight from Pakistan: an empirical study. A survey as a method was used in the study. A sample size of 40 companies was selected from four sectors (textile, sports, and surgical instrument) to collect information via in-depth interview with managers. The study found that there is a positive relationship between improvement strategies and organization performance. The study concluded that continuous improvement has an influence on organization performance.

Nwatu (2024) assessed on improvement strategies and product efficiency of vegetable oil firm in Anambra State Nigeria. It adopted the survey method of research. The population of this research work was drawn from the workers in the selected vegetable oil firm which has a total population of nine hundred and forty-two staff. The study found that improvement strategies have significant effect on product efficiency of vegetable oil firms in Anambra State. The study concluded that improvement strategies have significant positive effect on product efficiency.

Kegoro and Anyango (2020) researched on improvement strategies on operational performance of selected public universities in Kenya. Descriptive research design was utilized in this study. The target population of this study was five public universities in Kenya. Purposive sampling technique was adopted to select respondents from the five selected public universities. Israel formula was used to calculate the sample size of 44 respondents. The study found that there is a significant positive relationship between improvement strategies and operational performance of selected public universities in Kenya. The study concluded that improvement strategies contributed to overall efficiency and effectiveness of public universities in Kenya.

Kuria and Were (2020) conducted a study on the influence of business improvement strategies on organizational performance of banks in Kenya. This study adopted a descriptive research design. The target population was 2,800 top, middle and low-level management employees of banks in Kenya. The study sample size was 150 management employees. The study found that there was a strong positive and significant association between change management, automation, strategic alliances and outsourcing, as business improvement strategies, and organizational performance of banks in Kenya. The study concluded that change management, automation, strategic alliances and outsourcing playing a significant role in enhancing the organizational performance of banks in Kenya.

Njoroge and Nyaga (2022) examined on improvement strategies and organizational performance of large manufacturing companies in Kenya: a case study of Nairobi Bottlers Limited. The research was carried out following a descriptive research design. The study was conducted on 190 Nairobi Bottlers Limited personnel from various departments. The sample size for this study was generated using a stratified random sampling procedure, resulting in 57 respondents. The study found that improvement strategies impacted the performance of manufacturing companies. The study concluded that improvement strategies enhance organizational performance.

RESEARCH METHODOLOGY

The study used descriptive survey design. According to Kenya Association of Manufacturers (KAM, 2022), there are 91 medium Food and beverage manufacturing companies in Nairobi County. These manufacturing firms will be the unit of analysis while the management employees was be 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. 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 relied on primary data. The primary data was collected from the management employees in the firms using a semi structured questionnaire. Data obtained from the field will be coded, cleaned, and entered into the computer for analysis using the SPSS version 25. Descriptive statistical include frequency, percentages, mean and standard deviation. Inferential statistical analysis to be used will be multiple regression and correlation analysis. The significant of each independent variable was tested at a confidence level of 95%.

RESEARCH FINDINGS AND DISCUSSIONS

Out of the original sample of 231 managers in food and beverages manufacturing firms in Nairobi City County, 23 were used in a pilot study to test the reliability and validity of the research instrument. This left a remaining sample of 208 for the main study. Of these, 169 questionnaires were returned fully completed, yielding a response rate of 81.2%. This high response rate is particularly noteworthy as it significantly enhances the reliability and generalizability of the study's findings. According to Mugenda and Mugenda (2023), a response rate above 70% is considered excellent for analysis and reporting, as it indicates strong engagement from the respondents and minimizes the potential for non-response bias.

The 81.2% response rate suggests that the data collected is highly representative of the target population, making the study's conclusions robust and applicable to the broader context of supply chain management in the food and beverages manufacturing sector.

Descriptive Analysis

The study used descriptive statistics to summarize respondents' agreement with various statements on technological strategies, improvement strategies, and firm performance. A 5-point Likert scale was used where 1-strongly disagree, 2-disagree, 3-moderate, 4-agree, 5-strongly agree, with mean values and standard deviations calculated to interpret the findings. Mean values and standard deviations were calculated, and an aggregate score was computed for each category. The mean values and standard deviations were calculated to interpret the findings. A mean value of 1-1.4 was strongly disagree, 1.5-2.4 disagree, 2.5-3.4 neutral, 3.5-4.4 agree and 4.5-5 strongly agree. On the other hand, a standard deviation greater than 1.5, suggests that the responses were more diverse, with a wider range of scores across the participants.

Technological Strategies

The first objective of the study was to find out the influence of technological strategies on performance of food and beverages manufacturing firms in Nairobi City County, Kenya. Respondents were asked to indicate their level of agreement with various statements regarding technological strategies. Table 1 presents summary of findings obtained.

Table 1: Descriptive Analysis of Technological Strategies

Statements	Mean	Standard Deviation
Our organization utilizes cloud computing services for storage, computing power, or applications.	3.987	0.641
The adoption of cloud computing has improved our operational flexibility and scalability.	4.025	0.622
We have identified clear objectives and outcomes for our digital transformation initiatives.	4.001	0.651
Digital transformation initiatives have resulted in improved customer experiences and engagement.	3.988	0.678
We have dedicated resources and capabilities for collecting, analyzing, and interpreting data.	4.032	0.634
Data privacy and security are top priorities in our data analytics practices	4.012	0.659
Aggregate Score	4.008	0.647

The findings in Table 1 show that the respondents agreed on average that their organization utilizes cloud computing services for storage, computing power, or applications (M= 3.987, SD= 0.641); that the adoption of cloud computing has improved their operational flexibility and scalability (M= 4.025, SD= 0.622); and that they have identified clear objectives and outcomes for their digital transformation initiatives (M= 4.001, SD= 0.651). Respondents also agreed that digital transformation initiatives have resulted in improved customer experiences and engagement (M= 3.988, SD= 0.678); that they have dedicated resources and capabilities for collecting, analyzing, and interpreting data (M= 4.032, SD= 0.634); and that data privacy and security are top priorities in our data analytics practices (M= 4.012, SD= 0.659).

The study's finding that respondents generally agreed on the positive impact of technological strategies on firm performance, reflected by a high aggregate mean of 4.008 (SD= 0.647), aligns closely with the literature presented by Mushtaq et al. (2023) and Kihara, Bwisa, and Kihoro (2020). Mushtaq et al. (2023) demonstrated a significant positive correlation between

digital transformation elements and business performance in SMEs in Pakistan, highlighting how embracing technological advancements and investing in digital infrastructure can enhance operational efficiency and market adaptability. Similarly, Kihara, Bwisa, and Kihoro (2020) found a strong positive and significant relationship between technological strategies and the performance of manufacturing SMEs in Thika, Kenya. Their study concluded that technological strategies are crucial drivers of success in the manufacturing sector, further reinforcing the current finding that technological innovations play a vital role in boosting firm performance across different industries. These studies collectively validate the positive perceptions of technological strategies expressed by respondents in the present research.

Improvement Strategies

Study's second objective was to explore the effect of improvement strategies on performance of food and beverages manufacturing firms in Nairobi City County, Kenya. Respondents were asked to indicate their level of agreement with various statements regarding improvement strategies. Table 2 presents summary of findings obtained.

Table 2: Descriptive Analysis of Improvement Strategies

Statements	Mean	Standard Deviation
Our organization has specific goals and targets for reducing operational costs	4.017	0.626
We encourage employee involvement and ideas for implementing cost-saving measures.	3.993	0.654
We recognize and reward teamwork and collaboration through formal and informal mechanisms.	4.011	0.647
Feedback mechanisms are in place to continuously improve team dynamics and effectiveness.	3.971	0.673
Leaders and managers are trained to communicate effectively with their teams and stakeholders.	4.022	0.628
We solicit feedback from employees to assess the effectiveness of our communication practices.	3.985	0.669
Aggregate Score	4.000	0.649

From the findings, respondents generally agreed that their organization has specific goals and targets for reducing operational costs (M= 4.017, SD= 0.626); that they encourage employee involvement and ideas for implementing cost-saving measures (M= 3.993, SD= 0.654); and that they recognize and reward teamwork and collaboration through formal and informal mechanisms (M= 4.011, SD= 0.647). Respondents also agreed that feedback mechanisms are in place to continuously improve team dynamics and effectiveness (M= 3.971, SD= 0.673); that leaders and managers are trained to communicate effectively with their teams and stakeholders (M= 4.022, SD= 0.628); and that they solicit feedback from employees to assess the effectiveness of their communication practices (M= 3.985, SD= 0.669).

The study's finding of strong agreement among respondents on the positive impact of improvement strategies on firm performance, as evidenced by an aggregate mean of 4.000 (SD= 0.649), is well supported by the literature provided by Khan, Ali, and Hongqi (2021) and Njoroge and Nyaga (2022). Khan et al. (2021) found a positive relationship between continuous improvement strategies and organizational performance in various sectors in Pakistan, concluding that such strategies are crucial for sustaining long-term success and operational efficiency. Similarly, Njoroge and Nyaga (2022) examined the impact of improvement strategies on large manufacturing companies in Kenya, specifically Nairobi Bottlers Limited, and concluded that these strategies significantly enhance organizational performance. These studies reinforce the current findings by demonstrating that continuous improvement and

strategic enhancements are vital components for driving superior performance across different organizational contexts, thus validating the positive perceptions of improvement strategies observed among respondents in this study.

Performance of food and beverages manufacturing firms in Nairobi city county, Kenya

The general objective of this study was to determine the effect of Supply chain innovation strategies on performance of food and beverages manufacturing firms in Nairobi City County, Kenya. Respondents were asked to indicate their level of agreement with various statements regarding firm performance. Table 3 presents summary of findings obtained.

Table 3: Descriptive Analysis

Statements	Mean	Standard Deviation
Market share data is regularly analyzed to identify trends and opportunities for growth.	3.991	0.672
We benchmark our market share against industry standards and leading competitors.	4.012	0.631
Profitability is a key metric we monitor closely to assess financial health and performance.	4.001	0.649
Profitability targets are aligned with our long-term strategic objectives and financial forecasts.	4.024	0.644
Feedback from customer satisfaction surveys is used to identify areas for improvement and innovation.	3.986	0.678
We implement customer-centric strategies to enhance overall satisfaction and loyalty.	4.031	0.621
Aggregate Score	4.008	0.649

The findings show that respondents generally agreed that market share data is regularly analyzed to identify trends and opportunities for growth (M= 3.991, SD= 0.672); that they benchmark their market share against industry standards and leading competitors (M= 4.012, SD= 0.631); and that profitability is a key metric we monitor closely to assess financial health and performance (M= 4.001, SD= 0.649). Respondents also agreed that profitability targets are aligned with their long-term strategic objectives and financial forecasts (M= 4.024, SD= 0.644); that feedback from customer satisfaction surveys is used to identify areas for improvement and innovation (M= 3.986, SD= 0.678); and that they implement customer-centric strategies to enhance overall satisfaction and loyalty (M= 4.031, SD= 0.621).

The findings indicate that respondents strongly agreed that effective inventory management practices positively impact firm performance, with high aggregate mean scores of 4.008 (SD= 0.649). The finding aligns with Iqbal et al. (2022) who emphasized the significant role that total quality management (TQM) practices, which include effective inventory management, play in enhancing organizational performance within the shipping industry of Pakistan. Their study highlighted that well-implemented management practices lead to better operational efficiency and overall firm success. Similarly, Kuria and Were (2020) explored the influence of business improvement strategies, including inventory management, on the performance of banks in Kenya. They found a strong positive association between these practices and organizational performance, underlining the critical role that inventory management plays in maintaining operational efficiency and reducing costs. These studies support the current findings by demonstrating that effective inventory management is a crucial driver of firm performance across various industries and contexts.

Correlation Analysis

Pearson correlation was used to measure the strength and direction of the linear relationship between the study variables. The relationship was considered to be small if $\pm 0.1 < r < \pm 0.29$; medium if $\pm 0.3 < r < \pm 0.49$; and strong if $r > \pm 0.5$. Table 4 presents the findings obtained.

Table 4: Correlation Coefficients

		Firm Performance	Technological Strategies	Improvement Strategies
Firm Performance	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	105		
Technological Strategies	Pearson Correlation	.741**	1	
	Sig. (2-tailed)	.000		
	N	105	169	
Improvement Strategies	Pearson Correlation	.752**	.563	1
	Sig. (2-tailed)	.000	.780	
	N	169	169	169

The Pearson correlation coefficient between technological strategies and firm performance is 0.741 with a p-value of 0.000, indicating a strong positive and statistically significant relationship. This correlation suggests that the adoption of technological strategies, such as digital transformation, data analytics, and automation, is closely linked to improvements in firm performance. The strength of this relationship underscores the pivotal role that technology plays in driving operational efficiency and competitiveness within the organization. This finding is supported by the study conducted by Mutie, Kariuki, and Namusonge (2020), which found that technological strategies had a positive and significant influence on the performance of county governments in Kenya. Their research highlighted the importance of embracing technology to enhance public sector performance, which is consistent with the current study's findings on the critical impact of technological strategies on firm success.

The Pearson correlation coefficient between improvement strategies and firm performance is 0.752 with a p-value of 0.000, indicating a strong positive and statistically significant relationship between these variables. This result suggests that organizations that effectively implement improvement strategies, such as continuous improvement, employee involvement, and cost-saving measures, are likely to see significant enhancements in their overall performance. The positive correlation underscores the importance of fostering a culture of ongoing improvement to sustain long-term success. This finding is in line with the research by Nwatu (2024), which assessed improvement strategies in the context of vegetable oil firms in Anambra State, Nigeria. The study concluded that improvement strategies had a significant positive effect on product efficiency and overall organizational performance, reinforcing the critical role of continuous improvement efforts in driving firm success, as observed in the current study.

Multiple Regression Analysis

Table 5: Beta Coefficients

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.093	0.149		7.337	0.000
Technological Strategies	0.314	0.061	0.329	5.148	0.000
Improvement Strategies	0.301	0.064	0.312	4.703	0.000

From the regression analysis, the following equation was derived:

$$\text{Firm Performance} = 1.093 + 0.314 (\text{Technological Strategies}) + 0.301 (\text{Improvement Strategies})$$

The beta coefficient for technological strategies is 0.314, with a t-value of 5.148 and a p-value of 0.000, making it the most influential variable among the four. This suggests that technological strategies have the strongest impact on firm performance, with a 0.314-unit increase in performance for every one-unit increase in the effectiveness of technological strategies. This finding aligns with the study by Mwendu and Makokha (2023), which found that technological strategies significantly enhance the performance of Machakos County Government, emphasizing the critical role of technology in driving organizational success across different contexts.

The beta coefficient for improvement strategies is 0.301 with a t-value of 4.703 and a p-value of 0.000, indicating that improvement strategies significantly contribute to firm performance. A one-unit increase in the effectiveness of improvement strategies leads to a 0.301-unit increase in firm performance. This result is consistent with the research by Kegoro and Anyango (2020), which highlighted the positive relationship between improvement strategies and the operational performance of public universities in Kenya, demonstrating the broad applicability of continuous improvement efforts in enhancing organizational outcomes.

Conclusions

The study concludes that technological strategies have the strongest impact on firm performance among the variables studied. The adoption of digital technologies, including cloud computing and data analytics, along with a strong focus on data privacy and security, is critical for improving operational efficiency and competitiveness.

The study concludes that continuous improvement strategies are vital for enhancing firm performance. Setting clear goals, encouraging employee involvement, and recognizing teamwork are essential practices that lead to sustained improvements in operational efficiency and overall firm success.

Recommendations

Firms should prioritize the adoption of advanced technological strategies, such as cloud computing and data analytics, to improve operational efficiency and scalability. Investing in digital transformation initiatives should be a key focus, with clear objectives and outcomes identified to ensure these initiatives lead to tangible improvements in customer experience and engagement. Data privacy and security should remain top priorities, with firms implementing robust measures to protect sensitive information. Additionally, firms should allocate dedicated resources and capabilities for collecting, analyzing, and interpreting data to inform decision-making and drive continuous improvement.

Firms should establish specific goals and targets for reducing operational costs, with a focus on continuous improvement. Employee involvement should be encouraged by creating

platforms for sharing ideas on cost-saving measures and recognizing and rewarding teamwork and collaboration. Firms should implement feedback mechanisms that allow for continuous improvement of team dynamics and effectiveness. Leaders and managers should receive ongoing training in effective communication to enhance interactions with teams and stakeholders. Regular reviews of communication practices should be conducted to ensure they remain effective in supporting the firm's strategic objectives.

Areas for further Study

While this study provides valuable insights into the impact of supply chain innovation strategies on the performance of food and beverages manufacturing firms, future research could explore these strategies in other sectors or geographical areas to compare results. Additionally, further studies could investigate the role of emerging technologies, such as artificial intelligence and machine learning, in enhancing supply chain innovation strategies. Qualitative research could also be conducted to gain deeper insights into the challenges and experiences of firms in implementing these strategies.

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