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PROCUREMENT-CENTRIC VALUE CHAIN PRACTICES AND PERFORMANCE OF FOOD AND BEVERAGE FIRMS IN NAIROBI CITY COUNTY, KENYA

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ABSTRACT

Value chain analysis is a strategic process where a firm evaluates its internal activities to identify how each contributes to the firm's competitive advantage. Food and Beverages Manufacturing Firms in Kenya have always faced with supply chain disruptions as a result of increase in material costs resulting to a sales fall of, a reduction of operating income, and a reduction of return on assets. The general objective of the study was to determine the effect of procurement-centric value chain practices on performance of food and beverage firms in Nairobi City County, Kenya. The specific objectives was to examine effect of; distribution planning, warehouse optimization on performance of food and beverage firms in Nairobi City County, Kenya. The study was guided by; Theory of Constraints and The theory of storage. This study employed a descriptive research design. The target was 40 Food and beverage manufacturing companies in Nairobi City County. The unit of observation was 200 comprising of the procurement managers, operations managers, finance managers, stores and, and sales and marketing managers. The study used census hence the target was considered as the study sample. The study used questionnaires for data collection. The sample for piloting was 20 management staff representing 10% of the sample. This study used content and construct validity. Cronbach's Alpha Coefficient was used to measure questionnaires' reliability. Data was analyzed using SPSS Version 28. Findings were presented in tables. The content of the questionnaire was validated by the supervisor and professionals in management of Food and beverage manufacturing companies. From the regression analysis, distribution planning had the highest impact ($B = 0.412$, $p < 0.000$), followed by warehouse optimization ($B = 0.369$, $p < 0.000$). This confirms that efficient logistics, optimized storage significantly enhance firm performance. Based on the findings, the study concludes that value chain management is key to improving firm performance. Efficient distribution and optimized warehousing enhance cost efficiency, operational effectiveness, and market competitiveness. The study therefore recommends that firms should invest in digital logistics, AI-driven inventory tracking, warehouse automation. Policymakers should improve transport infrastructure and support technology adoption to boost industry competitiveness.

Key Words: Procurement-Centric Value Chain Practices, Distribution Planning, Warehouse Optimization, Food and Beverage Firms

Background of the Study

The value chain entails the different activities or processes firms perform to ensure that they produce goods and services of the required quality and standards. Manufacturing firms usually engage in different processes to produce products. Understanding how the various processes can be improved in manufacturing will lead to better output and quality. A well-managed value chain aims to optimize interactions between firm in order to increase service delivery, resource utilization, and cost savings, particularly in the area of inventory holding (Bakht, Bhattacharjee & Wani, 2021).

Value chain analysis is a strategic process where a firm evaluates its internal activities to identify how each contributes to the firm's competitive advantage. The definitive goal of a value chain analysis is to pin down the practices and processes that differentiate a firm from its competitors. Value chain analysis is a way for businesses to analyze the activities they perform to create a product. Once the activities are analyzed, a business can use the results to evaluate ways to improve its competitive advantage (Vidanapathirana, et al.,2020). Value chain analysis could help an organization to improve the quality of products/ services, evaluate competitive positioning, reduce delivery time both from suppliers and to the customers, and minimize costs through reconfiguring the value chain (Miranda, Monteiro, & Rodrigues, 2021).

Altekar (2023) describes the concepts of the value chain to be a road map of the way that the output is improved through provisions of the chain management processes that ranges from the initial necessary raw materials to the finished products and this may sometimes also include the services after the delivery of goods. Value chain has been known to be a fundamental approach of conducting internal analysis. It is also a way that is used to examine and analyze the specific activities or functions by which an organization creates value and also enables an organization compete more favorably.

Statement of the Problem

The Manufacturing sector contributes about 10% of the Kenya's GDP of which the food sector contributed about a third (33.4%) of the total manufacturing production in 2019 (KAM, 2023). Despite the sub-sector having majority of the firms, the contribution of the food and beverage manufacturing firms remains low compared to other sub-sectors such as the building and construction, chemical and allied manufacturing sub-sectors (KNBS, 2022). Moreover, more than 7 food and beverage manufacturing firms are in the verge of closing down their business following years of loss-making (KNBS, 2021). According to the economic survey (2022), while the entire manufacturing industry recorded a 24.7% growth in exports between 2017 and 2021, the food and beverage manufacturing sector only grew its exports by 11% in the same period. The overall growth of food and beverage manufacturing sub-sector stood at 0.3% in 2022 against the entire manufacturing industry's 1.6% growth in 2021 (Ministry of Trade and Investment, 2022).

According to Jepchumba (2024), food and Beverages Manufacturing Firms in Kenya have always faced with supply chain disruptions as a result of increase in material costs resulting to a sales reduction of 7 %, a reduction in operating income of 42 % and a reduction in return on assets of 35 % hence decline of shareholder return between 7 and 8 %. Food and beverage firms have considerable challenges from many stakeholders along the supply and value chain. The main source of friction is the gradual shift in power dynamics within the industry, particularly from producers to distributors. A lot of energy is used by food and beverage manufacturing firms. These firms uses so much energy during transportation and storage that produces 8% emissions like carbon dioxide, Sulphur oxides, nitrogen oxides and particulate matters which becomes an inconvenience to the locals and health menace (Gilmore, 2023).

Gati and Machoka (2023) revealed that some food and beverages manufacturing firms do not track inventory or use manual processes to do so, resulting in pricing errors ranging to 16% ineffective, congested warehouse floors, large year-end write-offs of up to 500 units per unit production, production shortage due to a long lead time of up to 10-15 days against 2-3 days. The Shipment delays result in having to spend more money on overnight items, a significant number of slow-moving items in stock, increasing warehousing operating costs by up to 38%. Most of the food and beverage-manufacturing firms in Kenya have failed to focus on manufacturing activities that improve value for them. Food and beverage manufacturing firms need to focus on increasing their domestic and global competitiveness. This can be achieved by focusing on value-chain activities and actors that will result in higher value-added products and technological content (Odoyo, Wanza & Donatta, 2023).

There are various studies on value chain in Kenya; Munyi and Deya (2019) study on effect of strategic value chain on performance of pharmaceutical companies in Kenya found that value chain activities have a significant relationship with firm performance. Ngunjiri and Ragui (2020) on effect of value chain on competitive advantage in the insurance industry in Kenyaconfirmed that organization competitive advantage and innovation, human resource management, marketing and operation have a positive relationship. Kuria and Kariuki (2022) showed that there is a moderate and significant correlation between logistics capability and firm performance, a small and significant relationship between operations capability and firm performance. However, no study on effect of value chain analysis food and beverage firms in Nairobi City County, Kenya hence the need to study effect procurement-centric value chain practices on performance of food and beverage firms in Nairobi City County, Kenya.

Objectives of the Study

i. To establish effect of distribution planning on performance of food and beverage firms in Nairobi City County, Kenya.
ii. To examine effect of warehouse optimization on performance of food and beverage firms in Nairobi City County, Kenya.

LITERATURE REVIEW

Theoretical Review

Theory of Constraints

Theory of Constraints (TOC) was developed by Goldratt (1990). Theory of Constraints (TOC) is based on the principle that any system, whether it is a business, a manufacturing facility, or any other type of organization, is limited by a small number of constraints, or bottlenecks. According to the TOC, the key to improving the performance of a system is to identify and manage these constraints. One of the key concepts in TOC is the idea of "throughput". Throughput is defined as the rate at which a system produces money through sales. According to TOC, the goal of a business should be to maximize throughput while minimizing inventory and operational expenses. This is achieved by identifying and managing constraints, and by implementing policies and procedures that focus on increasing throughput (Flores & Primo, 2008).

Another key concept in TOC is the idea of "buffer management". Buffer management is the process of managing the resources available to a system in order to ensure that the system can continue to operate effectively, even when faced with unexpected changes or disruptions. By managing buffers, businesses can ensure that they have the resources they need to continue operating, even when faced with unexpected changes or disruptions. The TOC also emphasizes the importance of "flow" in a system. Flow refers to the smooth flow of materials, information, and resources through a system. By ensuring that materials, information, and resources flow

smoothly through a system, businesses can improve the efficiency and effectiveness of their operations (Hald & Kinra, 2019)

Reddy and Telukdarie (2020) noted that the benefits of TOC are not just limited to the organization's performance but also extend to the employees. By correctly identifying and managing constraints, employees are judged on the correct parameters rather than just appearing busy. This can lead to a more efficient use of time, and employees can focus on the tasks that are most important to the organization. Additionally, by implementing buffer management, employees can feel more secure and confident in their roles, knowing that they have the resources they need to continue operating, even when faced with unexpected changes or disruptions (Terning, 2019). Distribution function is constrained especially on the management of transportation due to the involvement of many supplies chain partners which render the logistics management to be complex. This theory helps to explain the variable of distribution planning and points out that all distribution constraints must be evaluated so as to ensure there is efficiency in the distribution of goods.

The Theory of Storage

The theory of storage was first created by Nicholas Kaldor in 1939. The theory was further developed in 1939 by Kaldor, Brennan in 1958 and later Weymar in 1997. The theory of storage is centered on: storage costs, the motives of stock holding on the physical market, and the price discovery function of the futures markets. The principles of theory of storage are safety, accessibility, and orderliness which are closely interrelated and must be considered together. Certain basic storage principles and procedures must be observed regardless of the type of items. Materials must be stored properly to prevent injury to the ship and the crew and to prevent damage to the material itself. Items that are stored overhead and on top of bins must be secured with particular care because the lashing or other means of securing maybe subjected to heavy strain while the ship is underway. Materials and equipment must be arranged in storage to facilitate breakouts. Items that are issued most frequently should be located nearest to the breakout area. Whenever possible, items should not be placed on top of or behind a totally different kind of material.

Failure to observe these principles causes slow breakouts and slow and inaccurate inventories. Items must be stored so that, under ordinary conditions, the oldest stock will be the first issued; this process is the first in/first out (FI/FO) rule located nearest to the breakout area (Bala, 2016). Well organized warehouses help facilitate storing, issuing, counting, cleaning, and safety. This organization will result in a quicker determination of items that are low and thereby avoid unplanned replenishment. The theory supports the variable on warehouse optimization since proper warehouse management ensures that the space is well utilized and saves time during dispatch.

Conceptual Framework

A conceptual framework (Cresswell, 2003) is a graphical representation of the interdependence of variables that depicts a phenomenon inside a process system. Figure 2.1 depicts the conceptualization of the study variables.

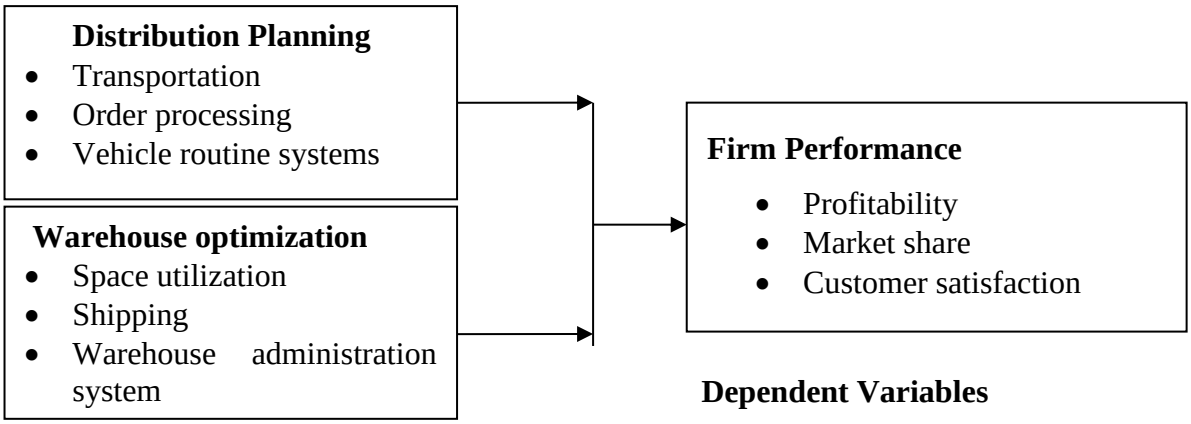

Figure 2. 1: Conceptual Framework

Distribution Planning

Distribution planning is the process of organizing and managing the distribution of goods and materials from the point of origin to the point of consumption (Nishizaki, et al., 2022). The main goal of distribution planning is to optimize the flow of goods and materials through the supply chain in order to maximize efficiency and meet customer demand. By carefully coordinating all the various elements involved in distribution, companies can minimize waste, decrease costs, and improve their bottom line (Sindiga, Paul, & Mbura, 2019).

Distribution planning a range of activities, including transportation, warehousing, order fulfillment, and inventory management, with the overarching goal of ensuring timely and efficient delivery of products to customers. Distribution planning a critical component of the supply chain, focusing on the physical flow of goods and information (Oluwakoya & Ogundipe, 2022). According to Mbithe and Charles (2021), effective distribution channels play a crucial role in increasing market penetration and customer satisfaction. They ensure that products are available in the right quantities, at the right time, and in the right location, which can lead to increased sales and profits. For instance, a well-designed distribution channel can help firms in to reach new markets, expand their customer base, and increase revenue streams. However, a poorly designed or managed distribution channel can negatively impact a firm performance.

Warehouse Optimization

Warehousing is an important element of activity in the distribution of goods, from raw materials and work in progress through to finished products. It is integral part to the supply chain network within which it operates and as such its roles and objectives should synchronize with the objectives of the supply chain (Leng et al.,2021). Warehouse optimization is the strategic process of improving operations within a warehouse to achieve efficient and effective operations. The most efficient warehouses are those that have been optimized to beat the competition on every level. The biggest challenges in warehouse management are poor or inaccurate inventory management, global supply chain delays, and poor time management. Storage issues can also affect the speed, efficiency and productivity of a particular warehouse operation or the entire process chain involved (Al-Sharif & Hamas, 2021).

The storage capacity of a warehouse is critical to the overall operation of warehousing. Some managers think that the whole available storage must be used for storage purposes, but in reality, this is one of the blunder mistakes that lead to the failure of many supply chains. The proper approach is focusing on utilizing the available space in such a way that smooth conduct of other warehousing activities apart from storage, like the ease of movement of workforce and

machinery, proper accounting units, can be assured. Warehousing is an important element of activity in the distribution of goods, from raw materials and work in progress through to finished products. It is integral part to the supply chain network within which it operates and as such its roles and objectives should synchronize with the objectives of the supply chain (Leng et al.,2021).

Larutama, Bentar, and Risdayanto (2022) indicated that the Warehouse Management System (WMS) is proven to increase the number of orders received and the company's operational efficiency in Indonesia. WMS aids inventory management with real-time stock data, preventing shortages or excesses. Successful implementation demands proper strategy, tech utilization, planning, system integration, and employee training. Thus, WMS implementation can bring about positive changes in warehouse operational efficiency, inventory optimization, and meeting customer needs.

A well-implemented warehousing management system helps in coordinating operations in the stores. This is imperative in ensuring the smooth production and these benefits the organization from the economies of scale and improved customer service. Well-implemented warehousing systems are designed to help in the specification of inventory procedures, operation, and control. There is lack of space for loading and unloading items, lack of shelves, pallets and racks; poor well established put away process for received items, poor tight control the storage areas, high warehousing cost, and high inventory cost (Kidane, 2023).

Empirical Review

Distribution Planning and Firm Performance

Kidanemaryam, Gebremicael and Ramana (2023) assessed the effect of place/distribution strategy on the brewery company's performance. The researcher applied explanatory research designs using a quantitative approach to achieve the study's objective. This research involved 310 employees of Ethiopia's brewery companies who completed questionnaires to obtain data. The study used simple random sampling to select individual respondents and purposive sampling to select the marketing department. According to the findings of this research, place/distribution strategy has a statistically significant and strong positive relationship with organisational performance. Moreover, place/distribution strategy explain very high variances in organisational performance substantially.

Ketere and Osoro (2023) examined effect of supply chain optimization on performance of dairy processing firms in Kiambu County, Kenya.. The study adopted a descriptive research design. The study population was 78 supply chain managers from the dairy processing firms in Kiambu County. The study adopted census. The study used questionnaires for data collection. Findings showed that there was a strong significant relationship between distribution channel and performance of dairy processing firms in Kiambu County, Kenya. The distribution of the milk products affects performance of the firms. A good transport system allows on-time delivery of raw materials to the organization and products to the customers. Vehicle scheduling enables reduction of operational costs and the firms' distribution plans offers flexibility to respond to customers' demand. Transport infrastructure and processes are adequate and reliable.

Ongati (2019) studied factors affecting performance of distribution logistics among production firms in Kenya: a case of Kibos Sugar Company limited and allied industries. The study applied descriptive approach through survey design. The target population comprised 26 employees. The sample size of the study was 24 respondents sampled using census sampling technique. Data was collected using questionnaires. The study revealed that distribution structure is a factor which influences distribution performance through availability of regional depots which enables customers to easily reach the products limiting stock outs which in the long run

translates to positive distribution performance. Route-planning enables timely deliveries of products, cost reduction in regard to time, fuel and vehicle maintenance.

Mbevi and Ndeto (2024) sought to examine the effect of lean supply chain management on performance of cement manufacturing firms in Machakos County, Kenya. The study adopted a descriptive research design. The target population was seventy-two (72) heads and assistant heads of production, procurement, store/warehouse, transport, sales and marketing as well as quality assurance departments in 6 cement manufacturing firms in Machakos County. The study used a census approach. The research used both primary as well as secondary data. Secondary data was collected from the annual; reports of cement manufacturing firms. Primary data was obtained by use of semi-structured questionnaires. Results showed that distribution management had a positive and significant effect on performance of cement manufacturing firms in Machakos County, Kenya. The study established that distribution management in terms of order processing, order fulfillment and order tracking have an effect on performance of cement manufacturing firms in Machakos County, Kenya.

Obiero (2019) examined the effectiveness of streamlined physical distribution to distributor small and medium-sized enterprises in Kericho County. The study employs a descriptive crosssectional survey design. Census sampling is applied, targeting 48 owner-managers of distributor SMEs, with 42 responding to the questionnaires. Primary data is collected through structured questionnaires, ensuring validity and reliability through construct validity and test-retest reliability. Descriptive statistics, including frequencies, mean, and standard deviation, are used to analyze the three study objectives. Streamlined physical distribution is predominantly adopted in order processing but less so in stock management. Challenges include political interference, unreliable market conditions, and unfair regulations and high taxes. Distributor SMEs need to improve strategies in transportation, distribution planning, customer service, and inventory management for sustainability, growth, and competitive advantages.

Warehouse Optimization and Firm Performance

Mohamud, Kafi, Shahron, and Zainuddin (2023) studied the role of warehouse layout and operations in warehouse efficiency. The study collected secondary data through systematic literature review. The researchers reviewed articles published between 2019 and 2022. Findings showed that the attributes of a warehouse make a big difference in how well it works by showing the good effects on efficiency. A warehouse is also more efficient when it is set up in a way that makes it easy to meet customer needs quickly. Warehouse operations are a key part of making it more efficient.

Prananingtyas and Zulaekhah (2021) analyzed the effect of logistics management carried out by warehouse operators in Central Java, Indonesia. The sampling method was purposive random sampling. The numbers of respondents involved in this study were 120 suppliers and farmers producing first-rate agricultural products. Warehousing is the cornerstone of logistics and supply chain management not only for large manufacturing industries, but also for first-level suppliers who provide raw materials to the market or industry. Logistics and supply chain management in the context of warehousing requires a combination of the effectiveness and efficiency aspects of space, time, and human resource management. Several facilities related to warehousing procedures have an important effect on performance.

Tafu and Chanika (2022) examined the critical factors influencing adoption of warehouse 0.4 in warehousing developing countries. The study used semi-structured interviews and focus group discussions. The respondents were staff of three manufacturing companies operating in 2 developing countries. The results showed the main factors influencing the adoption of warehousing 4.0 included cost considerations, technological readiness, the availability of

skilled workers, the regulatory environment, IT infrastructure, top management beliefs and support, and employee acceptance of warehousing 4.0.

Ararsa (2021) studied effect of warehousing management on warehouse performance in the case of Modjo dry port. Primary data was collected using questionnaires and interview schedules. Secondary data was collected from the firm's annual financial reports. Stratified simple random sampling was used to select 101 respondents. The descriptive analysis showed that there is lack of space for loading and unloading items, lack of shelves, pallets and racks; poor well established put away process for received items, poor tight control the storage areas, high warehousing cost, and high inventory cost. The multiple regression analyses revealed that receiving, storage, put away, order picking and shipping significantly influence warehouse performance of the organization.

Dukuly (2023) examined effects of warehousing management on organizational efficiency; a case of Africa Global Logistics, Rwanda Ltd. The researcher used mixed research design specifically descriptive and correlation research designs. The study sample was 96 respondents from selected department atAfrica Global Logistics, Rwanda Ltd. Questionnaires were used to collect the data. Findings showed that there was a significant relationship between warehousing management and organizational performance.

Muhalia, Ngugi, and Moronge (2021) studied the effect of warehouse management systems on supply chain performance of fast-moving consumer goods manufacturers in Kenya. The study adopted descriptive research design. The target was the operations manager of the 51 FMCG manufacturers located in Nairobi. The study used the census method to select 51 manufacturers of the FMCGs in Nairobi. Primary data was collected using questionnaires. The study found that warehouse management systems positively and significantly influences Supply chain performance of FMCG in Kenya. The study found that the respondents were in agreement that warehouse management system helps to reduce picking errors; warehouse management system facilities the maximum use of storage space; warehouse management system helps to optimize stock control; warehouse management system improves work productivity; and that warehouse management system guide workers through risk assessments and flag up warehouse safety requirements.

RESEARCH METHODOLOGY

This study employed a descriptive research design. The unit of analysis was 40 Food and beverage manufacturing companies. The unit of observation was the procurement managers (40), operations managers (40), finance (40) stores (40), and sales and marketing managers (40). The managers are targeted since they are conversant with the day-to-day activities of the firms ants. Therefore, the target was 200 respondents. Since the population of the study is relatively small and can be easily accessed, the study used Census. Census is appropriate for a population of less than 200. Census is an economically viable method as it is less costly, saves time and requires less manpower to collect data (Anderson, Kelley, & Maxwell, 2017).

They used questionnaires for data collection. According to Kowalczyk (2015), questionnaires are devoid of bias and errors from interviewers, which could jeopardize the survey's reliability and validity. According to Copper and Schindler (2018), a researcher can use 5-10% of the of the study sample to pre-test a questionnaire. In this study the sample for piloting was 20 management staff. Pilot test results were used to test questionnaires' validity and reliability. The collected data was cleaned, edited and coded before the analysis. Data was analyzed using SPSS Version 28 to generate descriptive and inferential statistics. The descriptive statistics included percentages, mean, and standard deviation. The inferential statistics included correlations and regressions.

RESEARCH FINDINGS AND DISCUSSION

In this study, 180 questionnaires were distributed to procurement managers, operations managers, finance managers, stores managers, and sales and marketing managers in food and beverage manufacturing firms in Nairobi City County. Out of the 180 questionnaires, 158 were completed and returned, resulting in a response rate of 87.78%. The achieved response rate of 87.78% is considered highly satisfactory, as it exceeds the 70% threshold recommended for survey research (Mugenda & Mugenda, 2003).

Descriptive Analysis

This section presents the descriptive analysis of the study variables, which include distribution planning, warehouse optimization and firm performance. The analysis provides insights into how respondents perceive this value chain practices in food and beverage manufacturing firms in Nairobi City County. Descriptive statistics such as mean scores and standard deviations are used to summarize the responses. The mean score reflects the central tendency of the responses, while the standard deviation indicates the level of variation in the responses. The mean values were categorized into five levels: 1.00 – 1.50 (Strongly Disagree), 1.51 – 2.50 (Disagree), 2.51 – 3.50 (Neutral), 3.51 – 4.50 (Agree), and 4.51 – 5.00 (Strongly Agree). A mean closer to 1.00 indicates a high level of disagreement, while a mean closer to 5.00 signifies strong Agreement with the statement. The standard deviation values further indicate the level of consensus among respondents, where a low standard deviation (near 0) suggests uniform responses, while a higher standard deviation (above 1.5) reflects significant variation in perceptions. The findings are presented in subsections according to the study variables.

Distribution Planning

Distribution planning is a key component of value chain management as it ensures timely delivery, proper vehicle scheduling, and efficient transport management. The first objective of the study was to establish effect of distribution planning on performance of food and beverage firms in Nairobi City County, Kenya. The study therefore assessed several aspects of distribution planning, including vehicle reliability, order processing, transport function, and distribution centers. Table 1 presents summary of findings obtained.

Table 1: Descriptive Statistics for Distribution Planning

Statements	Mean	Standard Deviation
The firm maintains has reliable vehicle routine systems	4.112	0.805
The orders are processed on time to enhance delivery efficacy	4.245	0.789
The firm balances various transport modes to minimize time in transit	4.198	0.756
The firm relies on the transport function to create access and connectivity within the supply chain	4.076	0.841
The firm employs transport management practices to create efficiency and better access	4.065	0.825
The firm has various distribution centres near the customer to reduce the cost of transport	3.978	0.902
The firm ensure that the trucks loads are optimized during delivery	4.089	0.874
Aggregate Score	**4.109**	**0.827**

The findings in Table 1 indicate that timely processing of orders to enhance delivery efficacy (M = 4.245, SD = 0.789) is the most highly rated aspect of distribution planning, suggesting that firms prioritize fast and accurate order fulfillment to enhance customer satisfaction and

streamline logistics. Balancing various transport modes to minimize time in transit (M = 4.198, SD = 0.756) demonstrates that firms leverage multiple transportation methods, such as road, rail, and air, to improve delivery efficiency and reduce transit delays. Maintaining a reliable vehicle routine system (M = 4.112, SD = 0.805) reflects structured fleet management, ensuring that delivery vehicles are well-maintained and operate on optimized schedules to minimize disruptions. Ensuring that truck loads are optimized during delivery (M = 4.089, SD = 0.874) indicates that firms strive to maximize transport efficiency and reduce logistics costs; however, the relatively high standard deviation suggests inconsistencies in truckload optimization practices across firms.

The transport function creating access and connectivity within the supply chain (M = 4.076, SD = 0.841) shows that firms emphasize logistics network expansion to facilitate the seamless movement of goods. However, the slightly higher standard deviation suggests some firms may face challenges in supply chain integration. Employing transport management practices to create efficiency and better access (M = 4.065, SD = 0.825) highlights that firms incorporate route optimization, real-time tracking, and transport automation to improve logistics performance. Availability of distribution centers near customers to reduce transport costs (M = 3.978, SD = 0.902) was the lowest-rated aspect, indicating that some firms still operate centralized warehouses, leading to higher last-mile delivery costs and longer delivery times. The highest standard deviation in this category suggests variability in firms' distribution network efficiency.

The aggregate mean of 4.109 suggests that distribution planning is effectively implemented, with firms excelling in order processing, transport management, and vehicle reliability. However, higher standard deviations in distribution center availability and truckload optimization indicate areas for improvement, particularly in decentralizing warehouse networks and enhancing load efficiency. These findings align with Kidanemaryam et al. (2023), who found that distribution strategy has a statistically significant and strong positive relationship with organizational performance. Their research confirmed that efficient transport and logistics planning significantly reduces costs and improves firm competitiveness. Similarly, Ketere and Osoro (2023) established that distribution channel optimization enhances firm performance by enabling faster deliveries, reducing operational costs, and improving supply chain agility. The present study supports these insights, highlighting that while firms have optimized key distribution planning aspects, enhancing last-mile delivery infrastructure and improving truckload efficiency could further enhance performance.

Warehouse Optimization

The second objective of the study was to examine effect of warehouse optimization on performance of food and beverage firms in Nairobi City County, Kenya. Warehouse optimization involves strategies to enhance storage efficiency, minimize damage, and optimize space utilization. The study examined warehouse management practices, including risk assessment, space usage, order fulfillment, and stock notification. Table 2 presents summary of findings obtained.

Table 2: Descriptive Statistics for Warehouse Optimization

Statements	Mean	Standard Deviation
Our warehouse team are effective in minimizing total goods damage that are stored in the warehouse	4.234	0.721
The firm is appropriately using available storage areas for storing goods	4.312	0.695
There is regular inspection and cleaning of storage areas.	4.287	0.709
Warehouse management system facilities the maximum use of storage space	4.201	0.743
Operators are guided by the risk assessment of warehouse management.	4.165	0.768
The orders are always delivered to the right customer on time	4.245	0.731
The unloading and packing costs are within the market range	4.089	0.782
There is a pre-notification of the incoming goods that will be received in the warehouses	4.115	0.810
Aggregate Score	**4.206**	**0.745**

The firm appropriately using available storage areas for storing goods (M = 4.312, SD = 0.695) is the most highly rated aspect of warehouse optimization, suggesting that firms have structured and efficient space management strategies. Proper utilization of warehouse space minimizes congestion, improves retrieval efficiency, and reduces the risk of inventory loss or damage. The low standard deviation indicates a high level of consensus, meaning that most firms have implemented effective space utilization techniques consistently. Regular inspection and cleaning of storage areas (M = 4.287, SD = 0.709) follows closely, reflecting firms' commitment to maintaining hygiene and safety in warehouse operations. This suggests that firms conduct routine warehouse audits to prevent contamination and deterioration of stored goods, which is crucial for the food and beverage industry.

Orders always being delivered to the right customer on time (M = 4.245, SD = 0.731) demonstrates that firms prioritize timely order fulfillment, ensuring that products reach customers accurately and without unnecessary delays. This efficiency is critical for maintaining customer satisfaction and supply chain reliability. Warehouse teams effectively minimizing damage to stored goods (M = 4.234, SD = 0.721) shows that firms have implemented proper handling procedures and safety measures to protect inventory from damage or spoilage. This practice reduces financial losses due to defective or expired goods and enhances overall warehouse efficiency. The warehouse management system facilitating the maximum use of storage space (M = 4.201, SD = 0.743) suggests that firms integrate technology-driven warehouse solutions, such as automated inventory tracking and optimized shelving arrangements, to enhance storage capacity and operational efficiency. The relatively low standard deviation indicates consistent application of warehouse management systems across firms.

Operators being guided by risk assessment in warehouse management (M = 4.165, SD = 0.768) highlights that firms have structured risk assessment protocols to identify and mitigate potential warehouse hazards. These risk management measures improve workplace safety, regulatory compliance, and inventory security. Pre-notification of incoming goods received in the warehouse (M = 4.115, SD = 0.810) shows that firms employ advanced tracking systems and communication protocols to prepare for inbound inventory, reducing bottlenecks and improving warehouse workflow. The slightly higher standard deviation suggests some variability in pre-notification practices across firms. Unloading and packing costs being within market range (M = 4.089, SD = 0.782) received the lowest rating, indicating that some firms

face challenges in managing labor and packaging costs effectively. The moderate standard deviation suggests variability in cost-efficiency strategies, implying that some firms have optimized their loading and packing processes while others may still struggle with high costs.

The aggregate mean of 4.206 suggests that firms have highly effective warehouse optimization strategies, with space utilization, inventory safety, and order fulfillment being the most well-implemented aspects. However, cost-related inefficiencies in unloading and packing operations remain an area for improvement. These findings align with Mohamud et al. (2023), who found that warehouse layout and operations significantly influence warehouse efficiency by improving storage optimization, reducing wastage, and enhancing operational flow. Similarly, Muhalia et al. (2021) emphasize that the integration of warehouse management systems (WMS) enhances storage control, minimizes stock handling errors, and improves supply chain performance. The present study confirms these insights, highlighting that while firms effectively manage warehouse operations, further improvements in cost-efficiency and inbound logistics could enhance overall warehouse performance.

Firm Performance

The general objective of the study was to determine the effect of procurement-centric value chain practices on performance of food and beverage firms in Nairobi City County, Kenya. Firm performance is assessed based on profitability, market share, and customer satisfaction. Table 3 presents summary of findings obtained.

Table 3: Descriptive Statistics for Firm Performance

Statements	Mean	Standard Deviation
The firm has witnessed an improvement in customer satisfaction with our delivery of goods and services	4.134	0.745
The firm has enhanced processes within the various units to achieve efficiency in operations	4.201	0.731
The firm is continuously reviewing policies to ensure there is effectiveness in the delivery of goods and services	4.167	0.759
The firm has seen an improvement in the growth of its revenue streams	4.112	0.805
The firms has witnessed an expansion in the market share being served	4.076	0.841
Aggregate Score	**4.138**	**0.776**

Results in Table 3 show that enhanced processes within the various units to achieve efficiency in operations (M = 4.201, SD = 0.731) is the most highly rated aspect of firm performance, indicating that firms prioritize streamlining operations to optimize productivity, reduce costs, and enhance service delivery. The low standard deviation suggests a strong consensus among respondents, meaning that operational efficiency is consistently applied across different firms. Continuous review of policies to ensure effectiveness in the delivery of goods and services (M = 4.167, SD = 0.759) follows closely, showing that firms adopt regular policy evaluations to maintain adaptability and responsiveness in business operations. This suggests that organizations are proactive in identifying inefficiencies and making necessary adjustments to improve overall performance. Improvement in customer satisfaction with delivery of goods and services (M = 4.134, SD = 0.745) indicates that firms focus on customer-centric strategies, ensuring timely delivery, product quality, and service excellence. The relatively low standard deviation signifies consistent efforts across firms to maintain high customer satisfaction levels, reinforcing the importance of efficient supply chain management and customer service initiatives.

Growth in revenue streams (M = 4.112, SD = 0.805) suggests that firms have experienced financial growth due to operational efficiency and improved customer satisfaction. However, the slightly higher standard deviation reflects some variability in revenue growth across firms, implying that some organizations may be more financially stable and profitable than others. Expansion in market share being served (M = 4.076, SD = 0.841) received the lowest rating, indicating that while firms have achieved internal efficiency and revenue growth, expanding their market presence remains a challenge. The highest standard deviation in this category suggests variability in market expansion strategies, meaning that while some firms have successfully penetrated new markets, others may struggle with competitive pressures, regulatory constraints, or distribution limitations.

The aggregate mean of 4.138 suggests that firms demonstrate strong performance outcomes, particularly in operational efficiency, policy effectiveness, and customer satisfaction. However, market expansion remains a relatively weaker area, indicating that firms may need to strengthen growth strategies, expand distribution networks, and enhance competitive positioning. These findings align with Ongati (2019), who found that operational efficiency significantly improves firm performance by reducing production costs, optimizing logistics, and enhancing customer service. Similarly, Mbevi and Ndeto (2024) established that continuous policy review and structured distribution management contribute to financial growth and improved organizational performance. The present study supports these insights, confirming that while firms have successfully enhanced internal operations, further efforts are required to overcome market expansion challenges and achieve sustained competitive growth.

Correlation Analysis

The study conducted a Pearson correlation analysis to examine the strength and direction of relationships between distribution planning, warehouse optimization, and waste management with firm performance. Pearson's correlation coefficient (r) ranges from -1 to +1, where: Strong positive correlations ($r \geq 0.5$) indicate a significant association, meaning that higher implementation of a particular value chain practice enhances firm performance. Moderate correlations ($0.3 \leq r < 0.5$) suggest a reasonable connection, though external factors may also influence firm outcomes. Weak correlations ($r < 0.3$) imply a limited impact, indicating that the variable may not significantly influence firm performance. Negative correlations ($r < 0$) point to an inverse relationship, meaning that poor implementation of a value chain practice may negatively affect firm performance. This correlation analysis helps in identifying which value chain practices contribute most to firm performance and where strategic improvements are necessary.

Table 4: Correlation Matrix

Variables		Firm Performance	Distribution Planning	Warehouse Optimization
Firm Performance	Pearson Correlation	1.000		
	Sig. (1-tailed)			
	N	158		
Distribution Planning	Pearson Correlation	0.621*	1.000	
	Sig. (1-tailed)	0.000		
	N	158	158	
Warehouse Optimization	Pearson Correlation	0.578*	0.517	1.000
	Sig. (1-tailed)	0.000	0.097	
	N	158	158	158

Distribution Planning ($r = 0.621$, $p < 0.05$) had the strongest positive correlation with firm performance. This suggests that firms that optimize distribution logistics, transport

management, and order fulfilment tend to experience better operational efficiency and customer satisfaction. A strong distribution strategy ensures that products are delivered on time, in the right quantity, and with minimal logistics disruptions, which significantly boosts firm performance. These findings align with Kidanemaryam et al. (2023), who found that effective place/distribution strategy has a statistically significant impact on organizational success by reducing stock-outs, optimizing delivery, and increasing customer trust.

Warehouse Optimization ($r = 0.578$, $p < 0.05$) also exhibited a strong correlation with firm performance, indicating that firms that effectively utilize warehouse space, manage inventory accurately, and minimize damages experience higher operational efficiency. Proper warehouse management reduces waste, prevents stock loss, and ensures smooth order processing, which translates into better firm performance. This finding is supported by Mohamud et al. (2023), who established that warehouse optimization significantly improves supply chain responsiveness and cost control.

Regression Coefficients

The regression coefficients in Table 5 provide insights into the influence of each value chain practice on firm performance.

Table 5: Regression Coefficients

Variable	Unstandardized B	Std. Error	Standardized B (β)	t-Statistic	Sig. (p-value)
Constant	18.563	5.217		3.558	0.001
Distribution Planning	0.412	0.084	0.405	4.905	0.000
Warehouse Optimization	0.369	0.081	0.348	4.556	0.000

Based on the unstandardized regression coefficients, the fitted regression equation predicting firm performance (Y) from the four value chain practices is:

$$Y = 18.563 + 0.412X_1 + 0.369X_2$$

Where: Y = Firm Performance, X_1 = Distribution Planning, X2 = Warehouse Optimization

Distribution Planning ($B = 0.412$, $p < 0.000$) showed the strongest positive influence on firm performance, suggesting that firms investing in efficient logistics, transport coordination, and order fulfillment strategies experience improved operational efficiency and market reach. These findings align with Kidanemaryam et al. (2023), who found that distribution planning significantly impacts firm success by reducing delivery delays and enhancing customer satisfaction.

Warehouse Optimization ($B = 0.369$, $p < 0.000$) had the second-highest positive influence, indicating that firms that implement structured warehouse management, efficient inventory storage, and real-time tracking enhance supply chain effectiveness. These findings align with Mohamud et al. (2023), who established that warehouse efficiency improves order accuracy, reduces damage, and enhances cost-effectiveness.

Conclusions

The study concludes that distribution planning is the most influential factor affecting firm performance. Efficient distribution strategies ensure that products are delivered on time, in the right quantity, and through cost-effective transport mechanisms. Firms that have structured and optimized logistics, transport management, and order fulfilment systems achieve higher customer satisfaction and operational efficiency. However, some firms continue to face challenges related to distribution center availability and truckload optimization, which can increase operational costs and delay product delivery. Addressing these issues through

decentralized distribution networks, better fleet management, and digital logistics solutions will significantly enhance firm performance.

Warehouse optimization was also found to have a significant positive effect on firm performance. Efficient warehouse management ensures that storage space is used effectively, inventory is handled properly, and order fulfilment processes run smoothly. Firms that implement warehouse management systems (WMS), conduct regular stock inspections, and streamline packing and unloading operations are more likely to achieve higher productivity and cost efficiency. However, some firms face cost-related inefficiencies in unloading and packing operations, which increases their operational expenses. Adopting lean warehousing practices, warehouse automation, and better cost-control strategies will help firms improve warehouse performance and, consequently, their overall profitability.

Recommendations

Recommendations for Distribution Planning

The study found that distribution planning had the strongest impact on firm performance, with well-structured transport management, optimized truckload utilization, and timely order processing playing a crucial role in enhancing efficiency. However, some firms still struggle with logistical inefficiencies, high transport costs, and inadequate decentralization of distribution networks.

To enhance distribution efficiency, firms should invest in advanced transport management systems (TMS) that enable real-time tracking, route optimization, and fleet monitoring. By leveraging GPS tracking and digital logistics platforms, firms can ensure timely deliveries, reduce transport costs, and improve supply chain visibility. Additionally, decentralizing distribution centers by establishing regional hubs will help firms reduce last-mile delivery delays and transportation expenses. Investing in third-party logistics (3PL) providers can also help firms expand their distribution reach and improve service delivery.

Firms should also focus on optimizing truckload capacity to avoid underutilization of transport resources. By implementing automated scheduling systems, companies can plan deliveries more efficiently, ensuring that vehicles operate at full capacity and reducing unnecessary trips. Moreover, fostering better coordination between logistics and inventory teams will enhance the alignment between stock availability and delivery schedules, preventing order delays and improving customer satisfaction.

Recommendations for Warehouse Optimization

Warehouse optimization was found to play a significant role in firm performance by improving storage utilization, order fulfilment, and warehouse efficiency. However, some firms experience challenges related to high packing and unloading costs, delays in order processing, and inefficient space management. To enhance warehouse operations, firms should invest in warehouse management systems (WMS) that provide real-time inventory tracking, automated stock updates, and digital order processing. These systems will help reduce human errors, improve stock visibility, and streamline warehouse operations. Additionally, firms should optimize warehouse layouts by implementing space-saving techniques, such as vertical storage solutions, slotting methods, and automated shelving systems.

Improving order fulfilment and reducing lead times should also be a priority for firms. This can be achieved by automating order picking and packing processes, thereby enhancing efficiency in product dispatch. Predictive analytics can be used to forecast storage needs and ensure warehouse capacity is fully utilized. Firms facing high warehousing costs should consider outsourcing non-core functions, such as packing and last-mile delivery, to specialized logistics providers to reduce operational expenses.

Policy Recommendations

In addition to firm-level recommendations, government agencies and policymakers have a role to play in enhancing value chain efficiency for food and beverage manufacturing firms. One key area of improvement is transport infrastructure, as poor road networks and high fuel costs contribute to inefficiencies in distribution planning. The government should invest in improving road, rail, and port infrastructure to facilitate faster, more cost-effective movement of goods. Incentives should also be provided to businesses adopting smart logistics solutions, such as electric delivery vehicles and digital freight platforms, to promote sustainable and efficient distribution networks.

Encouraging digital transformation in inventory and warehouse management is another critical area where policy interventions are needed. The government should introduce tax incentives and grants for firms investing in ERP systems, automated warehouses, and AI-driven demand forecasting. Developing standardized industry regulations on inventory control and warehouse management will ensure that firms adopt best practices and improve supply chain efficiency. Additionally, waste management regulations should be strengthened to encourage firms to adopt sustainable production and disposal practices. Policies should incentivize businesses that use recyclable packaging and enforce stricter environmental compliance standards. Certification programs and tax relief measures should be introduced for companies that meet sustainability benchmarks, encouraging industry-wide adoption of green practices.

Suggestions for Further Studies

This study explained 80.1% of firm performance, leaving 19.9% unexplained. Future research should explore additional factors such as technological innovation, supplier relationship management, and regulatory frameworks to provide a more comprehensive understanding of value chain efficiency. Studies on AI, automation, and blockchain in supply chain management could reveal their impact on efficiency and cost reduction. Additionally, research on supplier partnerships and procurement strategies would help firms optimize inventory and minimize disruptions. The role of government policies, taxation, and sustainability regulations in shaping value chain practices should also be examined. Further, exploring consumer trends, e-commerce, and changing market dynamics would provide insights into adaptation strategies for manufacturers. Finally, expanding research beyond Nairobi City County to other regions or industries could offer comparative insights into value chain best practices across different sectors.

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