VALUE CHAIN MANAGEMENT PRACTICES AND PERFORMANCE OF FOOD AND BEVERAGE MANUFACTURING FIRMS IN KENYA

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DOCTOR OF PHILOSOPHY IN

SUPPLY CHAIN MANAGEMENT

JOMO KENYATTA UNIVERSITY

OF

AGRICULTURE AND TECHNOLOGY

2026

Value Chain Management Practices and Performance of Food and Beverage Manufacturing Firms in Kenya

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A Thesis Submitted in Partial Fulfilment of the Requirements for the Degree of Doctor of Philosophy in Supply Chain Management of the Jomo Kenyatta University of Agriculture and Technology

2026

DECLARATION

This thesis is my original work and has not been presented for a degree in any other University.

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DEDICATION

This thesis is dedicated to my late Grandmother, Anninah Nyakaro, Dad, George Mbugua, and Mum, Rosemary Muthoni, who instilled the foundation of my education from childhood.

To my husband Jesse Gichuru and my children Kennedy Njenga, Phoebe Wanjiru, John Vianney Mwangi, Timothy Mbugua, and Nathaniel Kinaro, from whom I drew a lot of moral support, steadfast encouragement, inspiration, and motivation to continue seeking further knowledge in education and scaling greater heights academically, in my career, and life.

ACKNOWLEDGEMENT

I wish to thank the Almighty God for the gift of life, courage, strength, and guidance that have enabled me to work on this thesis. I sincerely thank each member of my family who continued to pray for me and for their patience, love, support, and kindness during the period. I would also like to express my sincere gratitude to my supervisors, Prof. Patrick K. Ngugi, Dr. Miriam Thogori, Dr. Nyang'au S. Paul, and Dr Peter Mwangi, for tirelessly and patiently guiding me through the phases of writing the concept, proposal, and this thesis to its due completion. I am indebted for the gift of Dr. Rev Fr Francis Murira, Dr. Rev Fr Bishop Peter S Kamomoe, and Fr Patrick Kanja, to whom I repeatedly sought their prayers and blessing. I also thank Dr Robert Kasisi and Walter Yoda for their statistical review and guidance to improve this thesis. I also acknowledge the input and the never-ending encouragement of my comrades Dr Peter Kibet, Dr Langat, Richard Yator, Peter Wangai, Regina Ngatia, Saadia Khalif, and all my lecturers; I appreciate the guidance and time we spent together toiling in class to ensure success. I am also thankful to staff members of the JKUAT fraternity in particular librarians , Nairobi CBD Campus, for their warm and friendly nature whenever I needed their assistance. For those whom I have not mentioned, please accept my gratitude. You might not be mentioned, but your names are forever engraved in my heart, and I thank you for your input towards this thesis.

Thank you, and May Almighty God bless you all.

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ABBREVIATIONS AND ACRONYMS

BIS	Business Innovation Survey
CDM	Charged Device Model
CFA	Confirmatory Factory Analysis
DC's	Distribution Centres
EIU	Economist Intelligence Unit
ERP	Enterprise Resource Planning
F&B	Food and Beverage
GDP	Gross Domestic Product
GGBL	Guinness Ghana Breweries PLC
ICT	Information Communication Technology
KAM	Kenya Association of Manufacturers
KBS	Kenya Bureau of Statistics
MRP	Materials Requirements Planning
RBV	Resource-Based View
RDT	Resource Dependence Theory
SCM	Supply Chain Management
SCRes	Supply Chain Resilience
SEM	Structural Equation Modelling

SEM-PLS	Structural Equation Modelling Partial Least Square
SPSS	Statistical Package for Social Sciences
SRM	Supplier Relations Management
UTAUT	Unified Theory of Acceptance and Use of Technology
VIF	Variance Inflation Factor

DEFINITION OF OPERATIONAL TERMS

Firm Performance Is the analysis of an organization's result output as measured against its intended goals and objectives measured in terms of profitability, growth, market value, total return on shareholder, economic value added, and customer satisfaction based on the stakeholder's expectations (Oadamola, 2020).

Food and beverage manufacturing Firm-These are firms that deal with the production and supply of goods and related products such as carbonated beverages, alcoholic drinks, and other household edible foods and beverages) KAM 2022)

Inbound logistics Refers to the management of the movement of goods, raw materials, and resources from suppliers to a company's operations or production facilities. It is a crucial part of the overall supply chain management process. Its activities primarily involve coordinating and transporting materials, inventory control, and warehousing (Bunnak & Prasertsang, 2021).

Market share the portion or percentage of total sales or revenue within a specific industry or market generated by a particular company or product. It is a valuable metric used to assess a company's competitive position within its industry and its relative size compared to other players in the market (Bushra Mervat & Rafa, 2021)

Material Management is the process of planning, acquiring, storing, moving, and controlling materials to be used

	effectively by facilities, personnel, resources, and capital. Chompunuch et al. (2022) saw material management as providing the right materials at the right place at the right time to maintain a desired production level at a minimum cost.
Operations Management	Managing core production activities that transform inputs into finished products or services. It encompasses the processes and activities directly involved in creating value for the organization's customers. Operations are vital in value creation and can significantly impact a company's competitive advantage (Ifeyinwa, 2022).
Outbound logistics	Focuses on the demand side of the supply-demand equation. The process involves storing and moving goods to the customer or end user. Outbound Logistics entails order processing, warehousing, and report preparation (Essel, 2021).
Profitability	Refers to the financial measure of a company's ability to generate profit, which is the amount of money a business earns after deducting all its expenses. It is a key indicator of a company's financial health and performance (Zhang et al., 2023)
Sales Volume	This is the number of units your company sells during a specific reporting period. This period could be a month, a quarter, or a year, depending on what level of sales volume you're seeking to analyze (Ramakrishna, 2023)

Technology Integration	Refers to the acceptance, integration, and use of new technology in society. The process follows several stages, usually categorized by the groups of people who use that technology (Oladamola, 2020).
Value Chain Management	Oversees and optimizes all activities within a company's value chain to create the most efficient processes for delivering customer value. The value chain includes everything from the initial sourcing of raw materials to production, marketing, distribution, and after-sales service (Zulfakar, Chan &Jie, 2023).
Value chain practices	Refer to organizations' activities and strategies for enhancing their competitive advantage and creating value for customers by delivering a product or service. Value chain practices encompass various aspects of operations, including procurement, production, marketing, distribution, and customer service. These practices aim to optimize efficiency, minimize costs, improve quality, and ultimately increase customer satisfaction and loyalty (Walker & Strickler, 2020).

ABSTRACT

The food manufacturing sector recorded a significant drop in performance from 4.7% to 1.6% and 2.7% to 0.2% ,2018/2019 respectively, according to the World Bank Economic Update in 2022. Furthermore, agricultural real value-added declined from 5.2% in 2019 to 1.6% in 2021. Further, the food manufacturing industry in Kenya has been experiencing much turbulence recently, including a drop in the GDP, an increasing trade imbalance, and the exiting of large multinationals such as Cadbury, Nestle, Procter & Gamble, and African Oils. The main focus of this study was to establish the relationship between value chain management practices and the performance of food and beverage manufacturing firms in Kenya. The specific objectives are determining the relationship between material management and performance of food and beverage manufacturing firms in Kenya, establish the relationship between outbound logistics and performance of food and beverage manufacturing firms in Kenya, assessing the relationship between operations management and performance of food and beverage manufacturing firms in Kenya, to establish the relationship between inbound logistic and performance of food and beverage manufacturing firms in Kenya and to assess the moderating effect of technological integration and the relationship between value chain management practices and performance of food and beverage manufacturing firms in Kenya. The study adopted descriptive research and explanatory research designs. The unit of analysis was 246 food and beverage manufacturing firms registered under the Kenya Association of Manufacturers (KAM) while the unit of observation consisted of 152 respondents drawn from these firms. A stratified random sampling technique was used, followed by simple random sampling within the different strata. Key informants in each firm formed the unit of observation. The questionnaire was used to collect primary data, while both quantitative and qualitative data were generated from closed-ended and open-ended questions. Secondary data were used to measure performance. Descriptive statistics, including frequency distribution, mean, and standard deviation, were used for data analysis. Inferential data analysis techniques, correlation, and regression analysis were used to establish the relationship between value chain management practices and the performance of food and beverage manufacturing firms. The study results were presented using tables, graphs, and figures. The study found that all the independent variables, material management, operations management, inbound logistics, and outbound logistics, had a strong, positive, significant effect on the performance of food and beverage manufacturing firms in Kenya. Further, for moderating effect, the study found that Technological integration has a positive moderating effect on the relationship between value chain practices and the performance of food and beverage manufacturing firms in Kenya. The study's recommendations include embracing technology and automation, strengthening collaboration with suppliers and development, improving order processing and transportation management, prioritizing customer satisfaction, establishing smooth inbound logistics mechanisms, leveraging technology for visibility and coordination, regularly updating and improving technology and systems.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

In an ever-changing business environment, organizational performance remains the central focus in utilizing value chain management. Manufacturing firms, too, operate in a dynamic market that motivates the utilization of models such as value chain management to achieve superior performance (Hsu, 2022). According to Chompunuch and Apsorn Kachonkitiya (2022), value chain management practices impact firm performance in Thailand. Inventory management practices, especially inventory control and order processing, influence firm performance in manufacturing sectors (Panigrahi, *et al*., 2021).

Value chain management practices have been executed to optimize resource utilization, minimize costs, and improve operational efficiency to achieve firm performance. According to Walters and Lancaster (2023), value chain management practices create end-user satisfaction and realize the performance objectives in the manufacturing industry. Supporting this view, Chebet and Kitheka (2019) the management of the value chain requires examining processes and uncertainties from the beginning to the end of the value chain in an integrated manner to enhance value chain optimization. Management of the value chain through inbound logistics, production scheduling, and Operations Management determines the extent to which firms achieve expected performance goals (Gadwe &Sangode, 2019)

Technology integration is critical in enhancing value chain management activities to optimize value chain processes. Electronic gadgets are now cheaper than ever, partly due to the low cost of manufacturing (Amy, Sithole & Buchana, 2022). Technology infrastructure is necessary to enhance value chain management. Amy, Sithole, and Buchana (2022) technology infrastructure as the shared technology resources contribute to achieving quality supplies, timeliness in supplies, and lead time in manufacturing companies. Technology adoption impacts supply chain performance

and organizational performance (Monika et al., 2020). Value chain management practices have been integrated with technological systems to achieve firm performance.

In Kenya, technological integration has been deployed in value chain management practices to achieve the performance of food and beverage manufacturing firms in Kenya. This study sought to determine the relationship between value chain management practices and the performance of food and beverage manufacturing firms in Kenya. This chapter presents the background of the study, problem statement, objectives, research hypothesis, significance of the study, and the scope of the study.

1.1.1 Food and Beverage Manufacturing

According to the Kenya Association of Manufacturers KAM, (2017) there are a total of 246 food and beverage manufacturing firms in Kenya registered with the Kenya Association of Manufacturers. Manufacturing firms in Kenya are both multinational and local, with a significant number of strong local companies. Many of these firms are based in Nairobi County, where the country's capital city is located (KAM, 2017). Examples of multinational firms include Guinness PLC, which partners with East African Breweries Ltd and Diageo Group to make and supply bottled beer to the South and East Africa markets, Coca-cola, Del Monte, Kurusu food products, etc., which are engaged in beverage production (Magutu et al., 2023). Notably, local companies like Unga Limited, Kenya Breweries Limited, and Bidco Africa Ltd play a significant role in the sector.

Due to the large dependence of the Kenyan economy on agriculture for its manufacturing sector, the food and beverage industry is very vital in Kenya (KAM, 2023). Agricultural products with value-added and processed foods, whose preparation is quick and straightforward, have demands created by the above and the influx of people in urban areas. Many food and beverage industries are working to improve their environmental performance and goods, and green value chain management practices are a logical extension of this work (KAM, 2023). The organizations have adopted green value chain management practices like public

buyers for various goods such as paints, paper used in the office, cleaners, and renewable energy. Green value chain management practices that encompass an extensive range of goods, services, and issues of the environment have also been developed by a few others (Mulweye et al., 2024). These efforts become better known as the business grows as green value chain management practices and an industry-advancing system impact the performance of firms.

The food and beverage industry continue to positively contribute to accomplishing the Millennium Development Goals in the intermediate and far-reaching term, especially the goals of eradicating hunger and extreme poverty and the goals of Development and Global Partnership. The most significant component of the Kenyan manufacturing sector remains the sector that processes food and beverages (KAM, 2023).

To supply the domestic and neighboring markets, operations in Nairobi have been established by major multinationals either as foreign-owned companies or as Kenyan shareholding joint ventures. An example is Guinness PLC, which partners with East African Breweries Ltd and Diageo Group to make and supply bottled beer to the South and East African markets. The same high standards of products well known around the world are produced by this company (KNBS, 2022). Other companies such as Coca-Cola, Del Monte, Kurusu food products, etc., are engaged in beverage production (Monika, Ngugi & Odhiambo, 2020). The food manufacturing industry in Kenya has been experiencing a lot of turbulence recently, including a drop in the GDP, an increasing trade imbalance, and the exit of large multinationals (Magutu, Aduda &Nyaoga, 2024).

1.1.2 The Concept of Performance

Firm performance is a multidimensional concept that reflects how effectively an organization achieves its objectives and sustains growth over time (Kwateng, 2019). Performance can encompass financial metrics, operational efficiency, customer satisfaction, employee engagement, and overall market competitiveness (Kusya, 2019). The measurement of firm performance varies according to the research focus, industry, and context. Still, it aims to capture aspects that reveal the organization's

success, resilience, and long-term potential. Researchers have employed various frameworks and metrics to assess firm performance, reflecting the diversity in strategic priorities and organizational goals (Leung et al., 2020).

A common way to measure firm performance is through financial metrics, which provide tangible profitability and shareholder value indicators. Studies by Kaplan and Norton (2019) show that economic indicators such as return on assets (ROA), return on equity (ROE), and profit margins are widely used to gauge a firm's financial health and its ability to generate returns. Similarly, market-based measures like stock price performance and earnings per share (EPS) are frequently used to assess shareholder value creation. Indicators provide quantifiable benchmarks for comparing firm performance within an industry and across time, although they may not fully capture non-financial aspects critical to long-term success (Kwateng, 2019)

Another approach to measuring firm performance considers operational efficiency, focusing on metrics that reflect a firm’s internal processes and productivity. For instance, researchers such as Asaolu, Agorzie, and Unam (2019) emphasize the role of value chain analysis in understanding how efficiently a company utilizes its resources in production, logistics, and supply chain management. Specific metrics include asset turnover, inventory turnover, and process efficiency indicators, demonstrating a firm’s ability to minimize costs and maximize output. High efficiency in these areas often translates to better cost structures, providing a competitive advantage in price-sensitive markets.

Several researchers argue that a firm's performance is also tied to customer satisfaction and its position in the market. For example, Lartey (2024) proposed service quality as a key measure, linking customer satisfaction to future revenue growth and loyalty. Additionally, market share and customer retention rates are frequently used as indicators of a firm's competitiveness and appeal to customers (Asaolu et al., 2019). These measures underscore the importance of aligning business activities with customer needs, as organizations that excel in customer service and satisfaction often see improved financial and operational outcomes over time (Liuet al, 2023).

1.1.3 Value Chain Management Practices

In the recent past, global value chain have been externally disrupted by numerous unforeseen events including, but not limited to, tsunamis (2022, 2020), hurricane cyclones or typhoons (US in 2021, Hongkong 2023), earthquakes), diseases, war , terrorist attacks and flood situations. Moreover, value chain practices are highly vulnerable to internal disruptions such as economic recessions, difficulties due to loss of major buyers, new technology, quality of the infrastructure also have had adverse effects on the present market, and such occurrences can also affect the future growth of the industries (Hongkong 2023).

In the business environment, the first wide-spread study on value chain practices began in the United Kingdom, following transportation disruptions from fuel protests in 2000 and the outbreak of the Foot and Mouth Disease in early 2001. The study explored the UK's industrial knowledge base about supply chain vulnerabilities and found that: supply chain vulnerability is an important business issue, little research exists into supply chain vulnerability, awareness of the subject is poor and a methodology is needed for managing supply chain vulnerability (Cranfield University, 2017; Pettit, Croxton & Fiksel, 2019).

Today, the Sri Lankan apparel industry is represented strongly in the premier global apparel outsourcing hubs. As an island and a tropical nation, Sri Lanka is experiencing, and is vulnerable to, the adverse effects of various types of climate change, such as rainfall variability, sea level increase, climate changes, etc. Occurrences of such disasters due to extreme conditions cause droughts, landslips and flash-flood situations, costing both lives and livelihoods, e.g., the tsunami of 2004, annual floods (2022, 2021), landslides (2022), cyclones (2022), etc. These conditions have negatively affected the livelihoods of employees and have presented challenges to apparel industry firms in terms of getting orders ready on time (EIU, 2016). Additionally, they especially need to tackle operational challenges such as rapidly changing orders and short product life-cycles in the manufacturing sector. Moreover, issues regarding economic crisis and changes in policies have been faced.

In New Mexico, a microchip supplier to two cell phones giants at that time, Nokia and Ericsson experienced a supply chain disruption in 2000. The 6-week supply disruption caused by a 10-minutes fire at Philips plant had a significant after-effect that lasted more than a year for its clients, and spread to the entire cell phone industry. Ericsson alone claimed a $2.34 billion loss and eventually exited the cell phone market. This incident reflects the fragility of modern value chains in many industries. The issue of risk dynamics and impact amplification and propagation should not be overlooked. With the increasing risk of exposure to both inbound logistics and an outbound supply chain and the escalating disruption susceptibility, the value chain practices capability is of importance for firms to sustain operation and stabilize output in a turbulent era (Pettit et al., 2019).

In an international survey on the sources and consequences of value chain practice disruptions, the Business Continuity Institute (2021) only reported the top five disruptions for organisations in sub-Saharan Africa. These include transport network disruptions as number one, followed by the volatility of currency exchange rates, civil unrest and/or conflict, loss of talent and/or skills and finally, outsourcing service failure. Developing countries, which constitute a significant part of global value chains and the world's population, have experienced the devastating effects of supply chain failures (Chika et al., 2022). Further, there are grounds for believing that the most catastrophic effects of value chain failures (particularly on human life) have been experienced in developing economies. Recent research on SCRES has examined the performance of value chains to product counterfeiters (Stevenson & Busby, 2021), and this can be a particularly acute problem in developing countries (Chika et al., 2022).

Grandia, (2023) notes that value chain practices has started being used in procurement decision making in Africa despite the fact that environmental criteria is still a new concept in the continent. Brammer and Walker, (2021) give an example of South Africa, where value chain procurement has been integrated into procurement procedures and policy most specifically in the city of Cape Town. The city having integrated value chain criterion in to its supply chain management policy allows the employees to include it in the decision-making process. Brammer and Walker,

(2016) asserts that in order help the employees be able to include the value chain criteria during the compilation of tender documents' specifications the city of Cape Town come up with a set of value chain procurement guiding principles that provide staff with relevant information. As a result, Cape Town has been described as one of the best performing cities in Africa (Brammer & Walker, 2024).

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Nyaga (2020) asserted that value chain practices have been used in procurement decision-making in Africa even though environmental criteria are still a new concept in the continent. Hello, and Shamsuzzoha (2020) gives an example of South Africa, where value chain procurement has been integrated into procurement procedures and policy, particularly in Cape Town. Having integrated value chain criteria into its value chain management practices policy, the city allows employees to include them in the decision-making process. Jaroli et al. (2022) assert that to help the employees include the value chain criteria during the compilation of tender documents' specifications, the city of Cape Town developed a set of value chain procurement guiding principles that provide staff with relevant information. As a result, Cape Town has been described as one of the best-performing cities in Africa.

The COVID-19 pandemic profoundly disrupted value chain management practices by creating unprecedented challenges in supply, demand, and logistics (Bolton, &Tarasi, 2023). With lockdowns, travel restrictions, and workforce shortages, many companies faced sourcing and manufacturing delays, leading to production halts and

inventory shortages. Simultaneously, shifts in consumer behaviour caused fluctuating demand, which made demand forecasting and inventory management more difficult (Bosire, 2023).

The Kenyan food-processing sector remains the most significant component of the manufacturing industry in terms of structure, economic contributions, and performance within the manufacturing sector (KAM, 2018). However, according to the Kenya National Bureau of Statistics (KNBS, 2019), the sector is contracting despite generating over a third (33.4 percent) of the total manufacturing production and providing 89,319 jobs. The abstract blames the contraction on production being too high and ingredient costs. Companies must evaluate their suppliers with these and many other challenges (Jepchumba et al., 2022).

The manufacturing industry in Kenya has experienced considerable turbulence in recent years, including a drop in the GDP, an increasing imbalance of trade, and the exit of large multinationals (Kimani, 2023). Therefore, proper analysis and improvements in the value chain would lead to more significant benefits. Managing a value stream would improve service and performance in market share, suppliers, and distribution channels and provide invaluable analytics for continuous improvement (Kuria & Kariuki, 2022).

The performance attributes that were considered in this study are profitability, sales volume, and market share. Value chain is a key function of any organization, public or private, and in this era of globalization with the advent of entrepreneurial organizations; management of purchasing and supply in the private sector has gained more prominence (Kusya, 2023). Effective management of the function prevents the possibility of poor performance and when attributed to non-adherence to proper procurement processes and procedures, is an indicator of poor management of the value chain function (Magutu et al., 2019).

The performance of the manufacturing industry has faced challenges such as depressed domestic demand, increased oil prices, and transport costs for years (Kaplan & Norton, 2023). Rising operating costs mainly as a result of high-power costs coupled with deteriorating road and rail networks, further dampened

performance in the sector (Goldsmith, 2023). The rise in increased output in the agro-processing industries has also facilitated performance in the manufacturing industry. These included sugar, milk, grain milling, fish, tea, oils, and fats processing sub-sectors (Awino, 2023).

However, the manufacturing environment has changed with considerations such as globalization, technological integration, etc. Therefore, this has led to manufacturers of all sizes realizing they would be profitable if their value chain were efficient and effective (Koponen, 2023). Value is defined as the amount buyers are willing to pay for what a firm provides, leading to the conception of the term "value chain," which is defined as the combination of nine generic value-added activities operating within a firm that are primary activities that include inbound and outbound logistics, marketing and sales, service and support activities that is procurement, Technological integration, human resource management, and firm infrastructure – activities that work together to provide value to customers in a value chain model that demonstrates how a firm can generate more value to their customers by reducing nonvalue adding activities (Jessop, Barry & Morrison, 2023). The value chain is a higher-level model of how businesses receive raw materials as input, add value to raw materials through various processes, and sell finished products to customers (Nikov, 2023).

1.2 Statement of the Problem

In Kenya, however, food and beverage companies have reported diverse performances, with some recording profits while others losing. For instance, companies such as Delmonte Company reported a decline in net sales of 561.7 million in the year 2023, Sasini Tea and Coffee production reported a decline of 53.6% in sales and a decline in profitability margin amounting to Kshs 542.6 million, while Sambisa reported an increase in net sales of Kshs 104.8 million (KAM,2024). The grain milling subsector grew by 6.2 percent in 2021 compared to 11.7 percent the previous year, as the beverage sector showed a 9.2 percent performance (KNBS, 2022). In addition, food manufacturing companies in Kenya have been experiencing fluctuations in profitability in their production and inbound logistics (KAM, 2019).

The food manufacturing sector recorded a significant drop in performance from 4.7% to 1.6% and 2.7% to 0.2% 2018/ 2019 respectively according to the World Bank Economic Update in 2021. Furthermore, agricultural real value-added declined from 5.2% in 2019 to 1.6% in 2021 (WB,2022). Further, the food manufacturing industry in Kenya 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 such as Cadbury, Nestle, Procter & Gamble, African Oils (Magutu, Aduda & Nyaoga, 2020)

Scholars have identified value chain management practices as an alternative paradigm to the performance of food and beverage manufacturing firms. According to Sazzadur and Vichayanan (2019), inbound logistics and material management are instruments to optimize firm performance in meeting consumer service requirements, reducing the cost of operations, improving efficiencies and utilization of resources, effectively contributing to the profitability of the companies. While food and beverage manufacturing firms in Kenya adopt value chain management practices, a few studies, such as Thuku and Kombo (2019) and Nyongesa and Shale (2019), have tried to link value chain management practices to performance in large manufacturing companies without much attention to food and beverage firms in Kenya. This study seeks to establish the relationship between value chain management practices and the performance of food and beverage manufacturing firms in Kenya to resolve performance mix cases in the subsector.

As value chain management practices are implemented to ensure companies achieve performance goals, organizations deploy technologies in value chain management to optimize manufacturing processes. Nurazwa et al. (2019) and Amy, Sithole, and Buchana (2022) opined that adopting technologies in value chain processes contributed to organizational productivity in manufacturing companies. Technology integration is sought to support value chain management, outbound and inbound logistics, operations, and material management to foster value optimization in food and beverage manufacturing in Kenya. However, the contribution of technology integration in value chain management practices to achieve the performance of food and beverage manufacturing firms in Kenya remains unstudied. According to

Monika et al. (2020), technology adoption contributes to organizational productivity in IT companies, while Amy, Sithole, and Buchana (2022) linked technological innovation to productivity in South African manufacturing firms. This study sought to determine the moderating effect of technological integration on the relationship between value chain management practices and the performance of food and beverage manufacturing firms in Kenya.

1.3 Objective of the Study

The study had both general objectives and specific objectives.

1.3.1 General Objective of the Study

The main focus of this study was to establish the relationship between value chain management practices and the performance of food and beverage manufacturing firms in Kenya.

1.3.2 Specific Objectives

The study was guided by the following specific objectives;

1. To determine the relationship between material management and the performance of food and beverage manufacturing firms in Kenya
2. To establish how outbound logistics relates to the performance of food and beverage manufacturing firms in Kenya.
3. To assess the relationships between operations management on the performance of food and beverage manufacturing firms in Kenya
4. To establish the relationship between inbound logistics and the performance of food and beverage manufacturing firms in Kenya
5. To assess the moderating effect of Technological Integration and the relationship between value chain practices and the performance of food and beverage manufacturing firms in Kenya

1.4 Research Hypotheses

The study was guided by the following statistical hypotheses

1. There is no significant relationship between Material management and the performance of food and beverage manufacturing firms in Kenya.
2. There is no significant relationship between Outbound Logistics and the performance of food and beverage manufacturing firms in Kenya
3. Operations management has no significant relationship with the performance of food and beverage manufacturing firms in Kenya
4. There is no significant relationship between Inbound Logistics and the performance of food and beverage manufacturing firms in Kenya
5. Technological integration has no significant moderating effect on the relationship between value chain management practices and the performance of food and beverage manufacturing firms in Kenya

1.5 Significance of the Study

The study would benefit any person interested in highlighting the opportunities and challenges that may exist in value chain management practices and their subsequent influence on the performance of food and beverage manufacturing firms; it is hoped that the study will benefit the following groups, manufacturing firms, stakeholders, and parties, including policymakers and academicians.

1.5.1 Food and Beverage Manufacturing Firms

This study adds to the existing theory on value chain management practices and can be used for future reference by interested parties. The findings of this project shall aid food and beverage manufacturers in establishing the right policies regarding managing their value chains. The study serves as a guideline for all those intending to invest in the food production sector. New business owners can practically incorporate value chain management into their business practices, thus making the businesses more efficient and effective.

1.5.2 Policy Makers

The research also adds to the existing policy on managing value chains for organizational performance. It provides additional insight into the existing policies and new insight into managing the value chains in the food production sector. The stakeholders have a better understanding of why value chain analysis is important in running a business in the food production sector. The findings of this study benefit firms that are yet to adopt value chain management practices that impact the overall organization's performance through their value chains. The management of these firms can determine the practices to adapt best to enhance value chain performance. The relevant policy makers are the Ministry of Industrialization, Trade and Enterprise Development, Kenya Association of Manufacturers (KAM), and other regulatory agencies involved in manufacturing and supply chain policy formulation.

1.5.3 Scholars and Academicians

The study is also valuable for researchers and academicians interested in furthering the research on value chain management practices vis-à-vis value chain performance in any industry. Its findings may also add to the literature on value chain management practices intended for scholarly and applied research.

1.6 Scope of the Study

The study focused on the performance of food and beverage manufacturing firms in Kenya because they have been experiencing declining profitability in their production and inventory management (KAM, 2022). This study focused on value chain management practices, which include material management, Outbound Logistics, operations management, and inbound logistics. Further, the study also focused on the moderating effect of Technological integration and the relationship between value chain management practices and the performance of food and beverage manufacturing firms in Kenya. The study adopted both descriptive research design and explanatory research design. The study targeted 246 Food and beverage manufacturing firms in Kenya. The study was conducted between 2021 to 2024.

1.7 Limitations of the Study

The organization's confidentiality policy might restrict most of the respondents from answering some of the questionnaires since it might be considered against the organization's confidentiality policy to expose the organization's confidential matters. The researcher presented an introduction letter obtained from the university, this helped to avoid suspicion and enabled the management to disclose much of the information sought by the study

Other limitations include the data for this study was collected from key informants, some of whom were not readily available due to their busy schedules. The researcher overcame this limitation by booking appointments with them. The study also experienced instances where some questionnaires were not returned. This limitation was addressed by maintaining a record of distributed questionnaires and closely monitoring the respondents' progress.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents the theoretical views of theories supporting the current study and an empirical literature review of study variables. It also outlines the conceptual framework depicting the relationship among the study variables as perceived by the researcher. Finally, the study has addressed a summary of the literature review, critiques of existing literature, and research gaps. The literature view supports understanding the research problem (Al Yasin, 2023).

2.2 Theoretical Review

Theories are formulated to explain, predict, and understand phenomena and, in many cases, to challenge and extend existing knowledge within the limits of critical bounding assumptions (Al Yasin, 2023). The theoretical review is the structure that can hold or support a theory of a research study. The theoretical review introduces and describes the theory that explains why the research problem under study exists (Rafiu et al., 2023). The following section analyses the theories that are relevant to the existing study. This study was anchored on Queuing Theory, Resource-based View Theory, Systems Theory and theory of constraints, and Unified Theory of Acceptance and Use of Technology

2.2.1 Queuing Theory

Queuing theory has its origins in research by Agner Krarup Erlang in 1909. This is a mathematical study of waiting lines or queues. The theory enables mathematical analysis of several related processes, including arriving at the back of the queue, waiting in the queue (a storage process), and being served in front of the queue (Sharma & Garg, 2022). The theory permits the derivation and calculation of several performance measures, including the average waiting time in the queue or the system, the expected number waiting or receiving service, and the probability of

encountering the system in certain states such as empty, complete, having an available server or having to wait a certain time to be served (Abdali et al., 2023).

The existing methodologies to independently optimize facility layout design and material handling systems are mainly based on minimizing costs (Adebiyi & Adediran,2021). This is even though the inherent variability causes an accumulation of work-in-progress at the various stages of production, which eventually affects firms' competing strategies in terms of time, cost, and quality. Therefore, an integrated methodology that incorporates the manufacturing variability and concurrently optimizes the layout designs and materials handling is essential (Mohammed, 2022). The queuing model can be utilized to model the planning system variations and identify risks, and a genetic algorithm can be implemented to solve the integrated optimization problem. It is also demonstrated that the proposed optimization approach can significantly improve a production system concerning total traveling time, total work-in-progress in the system, utilization, quantity of material handling equipment, and the required area (Odumusor, 2024).

Queuing systems focus on the analysis of customer wait times. Therefore, the theory can be applied to almost every aspect of the business and customized for virtually every probability. The theory can be applied in determining materials requirements planning (MRP), value chain management, ideal stock levels, and even employee shift scheduling. Therefore, in material management, Queueing theory can help forecast customer demand, which helps determine how much stock to keep on hand at any given time (Odumusor, 2024). Queueing theory is relevant to this study because it helps when considering the best inventory management techniques for businesses (e.g., first in, first out vs. last in, first out) (Abdaliet al,2024). Queuing theory was used in this study to determine the relationship between material management and the performance of food and beverage manufacturing firms in Kenya.

2.2.2 Resource-Based View Theory

The resource-based View theory of a firm helps to identify and appraise its strategic resources relative to its competitors. According to Barne (2021), the RBV approach

can be traced back to Penrose in 1959, who described a firm as a collection of productive resources, and thus, it is more than just administrative (Komakecha et al., 2024). According to Arda et al. (2023), the theory was further developed by Wernerfelt in 1984. It stems from the principle that the firms' competitive advantage is their internal resources instead of their positioning in the external environment. Barney (2021), one of the contributors to RBV theory of the firm, suggests that the firm's structure, human capital, that is, the skills, judgment, and level of intelligence of the employees, and human resource management systems are key sources of competitive advantage to an organization. RBV theory believes that strategic management models can lead to sustained competitive advantage by enhancing competencies and developing a unique strategic market orientation for the organization.

Kwanya, Kiplang'at, and Wamukoya (2019) noted in their study that the resource-based view theory of the firm proposes that competitive advantage emanates from the assets and several resources owned by an organization that are of key value in comparison to those of its competitors. The Resource-Based View (RBV) suggests that any organization's sustainable exceptional performance and competitive advantage are due to the accumulation and utilization of resources, managerial choices, market imperfections, and strategic industry factors (Kwanya et al., 2019).

Resource-based View theory helps to explain how an organization can utilize its key resources within itself to gain a competitive advantage. Therefore, resource-based View theory was used in this study to establish the relationship between Outbound Logistics and the performance of food and beverage manufacturing firms in Kenya. This can be achieved by developing customized systems relevant to its operations. Competitive advantage is obtained from the assets and several resources within an organization that are of key value compared to those of its competitors. Resource-based theory suggests that resources that are valuable, rare, difficult to imitate, and non-substitutable best position a firm for long-term success (Arda, 2023). These strategic resources can provide the foundation to develop firm capabilities that can lead to superior performance over time.

2.2.3 Systems Theory

Systems theory was founded by the biologist Ludwig von Bertalanffy in 1972. Systems theory is an interdisciplinary approach that views complex phenomena as interconnected systems, consisting of components or elements that interact with each other to form a unified whole (Gadwe & Sangode, 2019). It provides a framework for understanding systems' behaviour, structure, and dynamics, ranging from natural ecosystems to organizations and social systems. A system is a set of interrelated components or elements that work together to achieve a common purpose. These components can be physical entities, processes, or abstract concepts. Systems can be further divided into subsystems, which are smaller systems within the more extensive system. Each subsystem contributes to the overall functioning and behaviour of the entire system (Hsu, 2022).

Systems theory emphasizes the importance of interactions and relationships between the components of a system (Ifeyinwa, 2022). The behavior and characteristics of a system are not solely determined by the individual components but also by the relationships and interactions among them. Changes in one component or subsystem can have ripple effects on other components or subsystems within the system. Systems theory recognizes that systems exhibit emergent properties that cannot be explained by studying the individual components in isolation. These emergent properties arise from the interactions and relationships between the components, giving the system unique characteristics and behaviors. Systems theory also emphasizes the holistic perspective, viewing the system as more than the sum of its parts. Systems theory often focuses on open systems, which interact with their environment and exchange inputs, outputs, and information (Ibegbulem & Okorie,2023). External factors influence open systems and adapt to changes in their environment. They maintain a dynamic equilibrium through continuous interaction and feedback with their surroundings (Jepchumba, Ngugi & Odhimbo, 2022).

Systems theory encourages a holistic view of operations, considering the interconnections and relationships between various components involved in the manufacturing process (Walker & Strickler, 2020). Food and beverage

manufacturing firms comprise procurement, production, quality control, logistics, and distribution subsystems. Systems thinking helps identify how these subsystems interact and influence each other, enabling a comprehensive understanding of the overall manufacturing operation (Gadwe & Sangode, 2019). For example, the systemic perspective allows firms to move from a single firm to the entire supply chain, involving many system actors that contribute to the overall profitability level of firms. This theory was therefore used to evaluate the relationship between operations management and the performance of food and beverage manufacturing firms in Kenya

2.2.4 Theory of Constraints

The Theory of Constraints (TOC) was proposed by Eli Goldratt (1984). Theory of constraints (TOC) is a system that views the organization or units in an organization as being limited in achieving more of its objectives by at least one constraint. Firms were always having one constraint (Gadwe & Sangode, 2019). TOC aims to maximize profit by ensuring the limiting factor is utilized more efficiently. The theory assumes that organizations can be assessed and organized by three measures: throughput, inventory, and operational expense. It seeks to maximize throughput and minimize operating expenses for administration, sales, and labor (Al Amin, Rahman, & Shahriar, 2020).

The core idea in TOC is that every system, such as profit-making firms, must have at least one constraint that limits the system from getting more of whatever it strives for and consequently determines the output of the system. A constraint is anything in an organization that hampers the organization’s progress or increases throughput. Thus, the firm’s failure to manage this constraint leads to a significant decline in its productivity. The same TOC analogy can be made to the value chain, where the weak value chain link can limit the effectiveness and efficiency of the entire value chain. In other words, the value chain fails at the weakest link (Muthoni & Mose, 2020).

Inventory in inbound logistics is the total cash a firm invests in purchasing things it aims to sell. At the same time, operational expense is all the money a company utilizes to turn inventory into throughput. On the other hand, it is the speed at which the system yields money from sales. The TOC approach enables focus on possible elements that impede efficiency and aim of exploiting the flow of entire value-adding operations; these constraints could lie anywhere in the SC (Stopka et al., 2023). As such, inbound logistics may become an impending factor if not effectively managed, and firms need to ensure operational efficiency. By so doing, firms were addressing the challenges of stockouts, long delivery lead times, and reduced inventory holding costs, hence optimal SC performance (Thi et al., 2023). This study, therefore, used the theory of constraints to establish the relationship between inbound logistics and the performance of food and beverage manufacturing firms in Kenya.

2.2.5 Unified Theory of Acceptance and Use of Technology

Jaroli Gupta and Dashora (2022) developed the Unified Theory of Acceptance and Use of Technology (UTAUT). This theory tries to explain user objectives regarding technology and their behavior. Nurazwa et al. (2019) adopted this theory in their research on adopting information and communication technology (ICT) in value chain firms in Kenya. Marikyan and Papagiannidis (2023) also adopted this theory in a study on the Influence of information-sharing systems on employee retention in multinational corporations.

UTAUT identifies four key constructs: expected effort (Markus et al., 2022), facilitating conditions, social influence, and expected performance, which are key factors of technology acceptance and use behavior. A study by Hakimi et al. (2024) shows UTAUT as a helpful instrument in elucidating use and innovation acceptance among various cultures, programming it as a strong theory compared to other technology acceptance theories. According to Mensah and Khan (2024), the theory provides managers with a framework to measure the likelihood of success as a result of the use of technology and to understand drivers of approval of technology, thus designing mediations against possible resistance (Hakimi et al., 2024).

UTAUT theory is powerful and flexible to enable studying the adoption of any new technology, in addition to being viable after extension as needed, robust and suitable in predicting usage behaviors and applicable to evaluating an individual's perception of technology usage. Therefore, it is suitable for studying the development of new technologies in the food and beverage industry (Nicał, 2023).). Therefore, the Unified Theory of Acceptance and Use of Technology was used to assess the moderating effect of Technological integration and the relationship between value chain practices and the performance of food and beverage manufacturing firms in Kenya

2.3 Conceptual Framework

A conceptual framework is a diagrammatic set of interrelated ideas on a particular phenomenon. It is characterized by cause-and-effect relationships, which help interpret the framework more and make it easily understandable. This makes it more straightforward and easily predictable (Svinicki, 2019). In this study, the independent variables include material management, Outbound Logistics, operations management, and inbound logistics; the moderating variable was Technological integration, while the dependent variable was the performance of food and beverage manufacturing firms in Kenya.

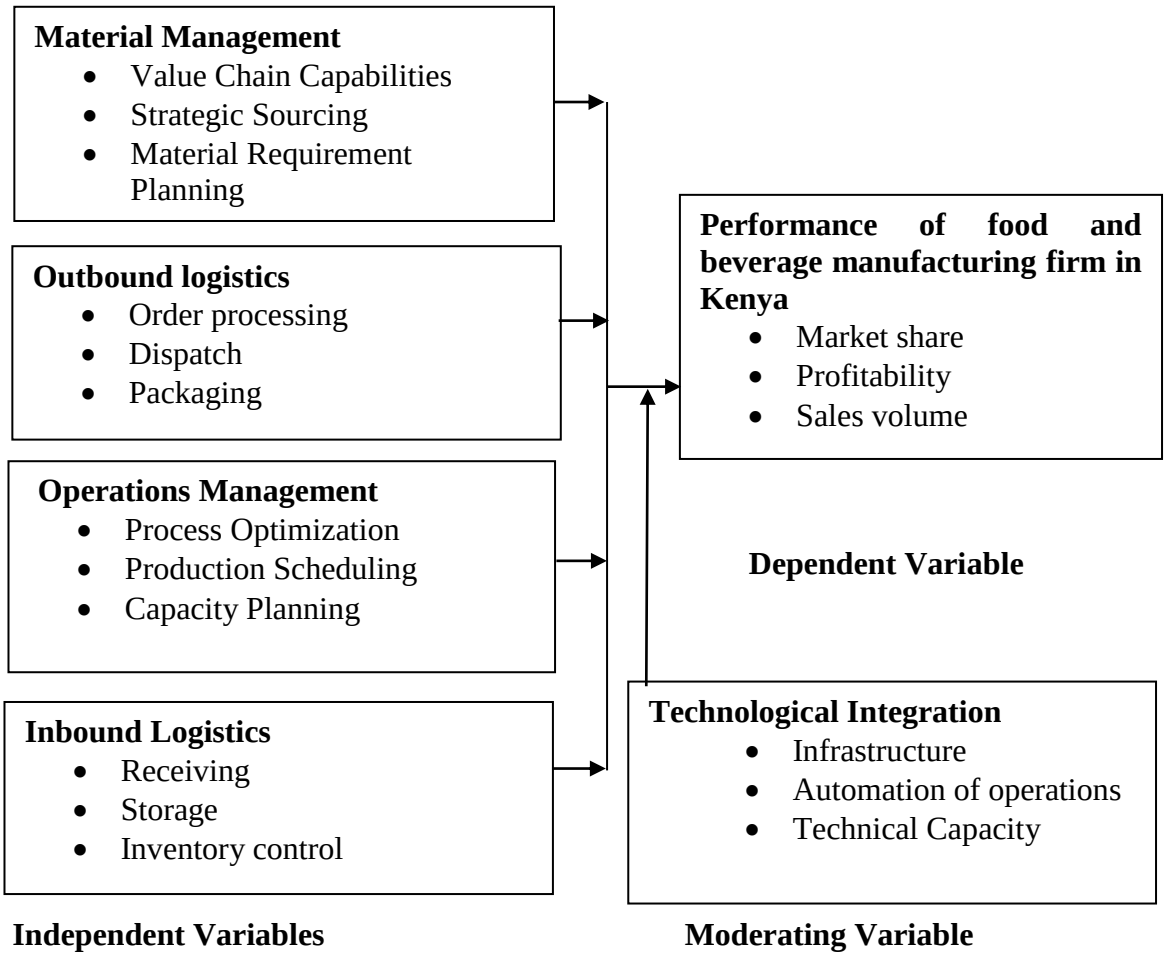

Figure 2.1: Conceptual Framework

2.3.1 Material Management

Material management refers to the planning, sourcing, purchasing, storing, controlling, and distribution of materials required for an organization's operations. Its main goal is to ensure that the right quality and quantity of materials are available at the right time and place, at minimum cost, while avoiding shortages or excess inventory (Thuku & Kombo, 2019).

Value chain capability is concerned with delivering the product based on strategic and operational value chain processes platforms such as purchasing, production, and logistics (Chompunuch, Apsorn & Kachonkitiya, 2022). According to Goulap et al. (2022), value chain capability can be characterized as a set of essential activities involved in the value chain process, such as information sharing and collaboration, as

well as critical elements in inter-organizational relationships, such as mutual trust and long-term partnership. Information sharing is usually identified as one of the most fundamental abilities in the value chain process and integration (Essel,2021) because it effectively enables buyers and suppliers to share and communicate expectations and performance and, thus, motivates value chain partners to enhance their capabilities. According to Ifeyinwa (2022), a collaborative capability involving more direct interactions and integrated activities between buyers and suppliers, such as technology co-development and collaborative problem-solving practices, has been reported as a critical means to effectively transfer operational and organizational knowledge to other value chain partners and implement various improvement initiatives (Nyongesa & Shale, 2019).

Strategic sourcing is a procurement process that connects data collection, spending analysis, market research, negotiation, and contracting. It stops short of purchasing and paying for goods and services (Ifeyinwa, 2022). Strategic sourcing can be customized to meet a customer's specific needs, but its primary goal is to leverage a single, integrated system to enhance profitability. Strategic sourcing best practices include digitizing documents, participating in a digital business network, and automating workflows (Essel, 2021)). According to Nwosu (2019), strategic sourcing is developing supply channels at the lowest total cost, not just the lowest purchase price. It expands upon traditional organizational purchasing activities to embrace all activities within the procurement cycle, from specification to receipt, payment for goods and services, to sourcing production lines where the labor market would increase firms' return on investment. Strategic sourcing processes aim to continuously improve and re-evaluate an organization's purchasing activities (Goulap et al., 2022).

MRP is used by businesses to plan production and delivery, keep track of inventory levels, and predict raw material requirements. While balancing supply and demand, MRP aids producers in understanding inventory needs (Chompunuch et al., 2022). Material Requirement planning integrates technology in inventory management to achieve efficiency in planning and controlling the material flow in manufacturing companies. Computerized inventory management contributes to the minimization of

inventory levels, reduction in lead time, and optimizing supply chain processes, achieving operational efficiency in the short term and profitability in the long term. Kithure and. Nyang'au (2022) opined that through data management, reliable forecasting, and efficient production planning, firms achieve effective MRP-generating purchase orders that influence the availability of materials needed, influence achieving efficiency in production processes, reduce downtime and optimization of resource contribution in sale volumes and profitability level. MRP's support for delivery capacity, production, and tied-up capital is linked to a flexible supply chain by providing an efficient logistic system that creates value. Kamalu et al. (2022) opined that flexibility in delivery, production, and volume results in faster supplier lead time in terms of better changeover times, fostering sales volumes, market share, and firm profitability in the manufacturing sector.

2.3.2 Outbound Logistics

The outbound logistics flow refers to transporting goods out of the business to external associates. It is set to help enterprises within a value chain to maximize the reliability and efficiency of a distribution network and further reduce or minimize transportation and storage costs (Kinisa, 2019). Outbound logistics is essential for delivering products to customers (Wack, 2022). Furthermore, Multiple activities are associated with outbound logistics, i.e., collecting, storing, and physically distributing the products to buyers, such as finished goods warehousing, material handling, delivery vehicle operation, order processing, and scheduling (Soosay, Fearne, & Dent, 2023). Outbound logistics is also critical for a distributor and can create additional advantages. Furthermore, finding solutions to enhance the outbound logistics flow can help reduce costs and improve profits. Moreover, logistics is the single function of a firm that interacts with upstream and downstream actors within the value chain. Outbound logistics is, therefore, an essential flow to the chain, which can create significant value if an organization continuously improves profits (Ihunwo & Ikegwuru, 2023).

Order processing is a key element of order fulfillment that occurs on the business end after a customer order. When a customer places an order, order management starts

and concludes when they receive the product or service. How you integrate order management into your business capabilities determines how well your firm performs. Long-term business success depends on customer pleasure, and reliable and accurate order fulfillment is essential to achieving this goal. Since automated systems can lessen order processing errors, they assist in ensuring that all customers' orders are filled promptly. This can improve consumer satisfaction and business profitability (Hashim et al., 2022).

Dispatching is the process of assigning tasks, resources, or personnel to specific jobs or locations in a timely and efficient manner. It involves coordinating the deployment of resources to meet demand, respond to emergencies, or execute planned activities (Sorin et al., 2023). Dispatching is crucial in various industries such as transportation, logistics, emergency services, and field operations, ensuring that resources are utilized optimally and tasks are completed according to schedule. This process often involves real-time monitoring, communication, and decision-making to adapt to changing conditions and priorities (Hura et al., 2024). Dispatching is essential for optimizing operations efficiency. Organizations can minimize idle time, reduce delays, and maximize productivity by assigning tasks or resources efficiently. Effective dispatching ensures that resources are utilized optimally to meet demand while reducing costs.

Packing is preparing a product or commodity for proper storage and/or transportation. Value chain optimization should manage product packaging in a timely, affordable, and error-free manner. While a poorly built supply network may hurt ROI and customer satisfaction, a well-structured value chain can lower costs and boost productivity during the production process. Few people know just how crucial product packaging is to the value chain. In every business, product packaging is vital. As a business owner, you want your items to be packaged in durable materials since they look beautiful and make buyers eager to receive them. Proper packaging may guarantee that business processes, from order processing to customer service, go smoothly (Sandar, 2024).

2.3.3 Operations Management

As part of the value chain analysis model, operations refer to the core production activities that transform inputs into finished products or services. It encompasses the processes and activities directly involved in creating value for the organization's customers (Gadwe & Sangode, 2019). Operations are vital in value creation and can significantly impact a company's competitive advantage. Operations aim to optimize the utilization of resources, including materials, equipment, labor, and technology, to achieve efficient production processes. The focus is on improving productivity, reducing waste, and enhancing cost-effectiveness. Efficient operations contribute to cost reduction, better profit margins, and competitive pricing. Operations entail process Optimization, Production Scheduling, and capacity planning (Mwale, 2019).

Process optimization systematically improves organizational processes to maximize efficiency, quality, productivity, and overall performance (Chompunuch et al., 2020). It involves analyzing and re-evaluating existing processes, identifying areas for improvement, and implementing changes to achieve better outcomes. The first step in process optimization is to map out the current process, including all its steps, inputs, outputs, and dependencies. Process mapping helps visualize the workflow and identify bottlenecks, redundancies, and areas of inefficiency (Plamen, Pavel & Ivan. (2023). Analyzing the process flow and performance metrics helps understand the current state and potential areas for improvement (Walker & Strickler (2020).

Production scheduling is a critical aspect of operations management that involves determining the timing and sequencing of production activities to efficiently meet customer demand while optimizing the use of resources (Gadwe & Sangode, 2019). It entails creating a detailed plan for when and how each task in the production process will be executed. Effective production scheduling ensures smooth operations, minimizes bottlenecks, reduces lead times, and maximizes overall productivity. Accurate demand forecasting is essential for effective production scheduling. Organizations can estimate future demand and plan production by analyzing historical data, market trends, customer orders, and other relevant factors. Demand forecasts provide the basis for determining production volumes and scheduling

timelines. Production scheduling considers the availability of various resources required for production, including labor, machinery, materials, and facilities. By considering resource constraints, organizations can ensure that production schedules are feasible and achievable within the available capacity (Bosire, 2018).

Capacity planning is a critical aspect of operations management that involves determining the optimal level of resources required to meet the demand for goods or services (Mwale, 2019). It entails analyzing current and future demand patterns, evaluating available resources, and making informed decisions to balance capacity and customer needs. Capacity planning aims to ensure that an organization has the right capacity to meet demand without incurring excessive costs or experiencing shortages. It involves short-term and long-term considerations, considering production capabilities, workforce capacity, equipment and facilities, and financial resources. Effective capacity planning helps organizations optimize resource utilization, minimize costs, enhance customer satisfaction, and improve operational efficiency. It enables businesses to respond to demand fluctuations, plan for future growth, and make informed decisions regarding investments in infrastructure and resources (Plamen et al., 2023).

2.3.4 Inbound Logistics

Receiving involves verifying the authorization for goods received, as well as their quantity, quality, and condition. Receiving food supply signals the point in the logistical process of the agricultural food value chain where the company has more control (Thi et al., 2022). Receiving concerns about whether the products purchased are received at the appropriate time and location. Preparing the list of goods to be received the following day in advance, using the daily receiving report as proof of items received, ensuring that items received meet specifications for quality, quantity, size, and weight, and recording shortages, excesses, missing items, and unacceptable items are all part of good receiving practices (Tembo & Mutono-Mwanza, 2024).

Another growing part of value chain logistics is the storage or short-term warehousing of chilled or frozen items. An integrated cold chain's main components are the packaging and refrigeration of fresh food. Because fresh food metabolizes

and consumes nutrients throughout its shelf life, from harvest or slaughter through packing, distribution, marketing, and sale, there is a need for a cold chain. Through respiration, enzymatic breakdown, and microbial degradation, carbohydrates, proteins, and other nutrients are broken down into simpler components, frequently resulting in a diminished quality or quantity of the foods (Bha & Yaday, 2018).

Inventory control is a framework business use to manage their interest in inventories (Lartey, 2024). It comprises keeping track of the stock level and monitoring it, anticipating future demand, and deciding when and how to make arrangements. Controlling inventory is a crucial organizational activity that aids in formulating strategies for making the best possible investment in inventory. Therefore, maximizing liquidity and risk might result from optimal inventory control. Cha Rahman and Naresuan (2019) state that inventory control balances the advantages of maintaining inventory and its associated expenses.

2.3.5 Technological Integration

In today's fast-paced business landscape, logistics management is undergoing a pivotal shift toward a technology-driven approach. This evolution is pivotal for enhancing service efficiency and effectiveness across various sectors. Integrating state-of-the-art technologies such as artificial intelligence (AI), the internet of things (IoT), blockchain, and comprehensive data analytics, logistics is being transformed into a more capable, dependable, and transparent domain. Traditional logistics, often reliant on manual labor and heuristic decision-making, is now rapidly embracing digital innovations. Blockchain technology also stands as a transformative force in the logistics sector.

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now rapidly embracing digital innovations. Blockchain technology also stands as a transformative force in the logistics sector.

The process follows several stages, usually categorized by the groups of people who use that technology (Nurazwa et al., 2019). The rate of technological change in the marketing environment is the most essential factor that influences relationship marketing success (Wang & Prajogo,2024). The internet has been changing rapidly and has provided many advanced technologies for doing business and managing customer relationships organizationally. Therefore, in this era of technology, technology plays a significant role in increasing customer service levels by providing new service delivery, strengthening customer intimacy, responding faster to customers' needs, and allowing customers to help themselves (Amy, Sithole, & Buchana,2022).

Technology infrastructure is necessary to enhance CRM. Monika et al. (2020) conceptualize technology infrastructure as the shared technology resources that provide the platform for the firm's specific information system applications. This infrastructure includes investment in hardware, software, and services such as consulting, education, and training that are shared across the entire firm or entire business units in the firm. Some technologies that contribute to enhancing value chain management practices are mostly communication tools used in providing customer service, which includes intelligent e-mail systems, a voice through Protocol (VoIP), voice recognition equipped interactive voice response (IVR), IP-based call centers, and other web capabilities that influence firm performance (Osio & Ehi, 2023). Other non-communication tools like an order tracking system, personalized web pages, and web forms give the customer a good experience (Kimani, 2021).

Automation of operations refers to using technology and software to streamline and mechanize various organizational tasks and processes. It involves replacing manual or repetitive tasks with automated systems, allowing for increased efficiency, accuracy, and profitability (Ravishankar, Elantheraiyan, Manoj & Logasakthi, 2024). Automation eliminates the need for manual intervention in routine tasks, reducing the time and effort required to complete them. This improves efficiency, as processes

can be executed faster and with fewer errors. By automating operations, organizations can reduce labor costs associated with manual tasks (Asare, 2024). Automation can also minimize the occurrence of errors and rework, saving costs in terms of time, resources, and potential financial losses. Automation provides real-time data and analytics, enabling organizations to make informed decisions based on accurate and up-to-date information.

Technical technological capacity is an organization's ability to effectively and efficiently apply technical knowledge, skills, resources, and tools to achieve its goals and objectives (Osio & Ehi, 2023). This capacity encompasses a range of attributes, including expertise, infrastructure, technology, and the ability to adapt to changing technological landscapes. It plays a critical role in an organization's ability to remain competitive, innovate, and meet the demands of its stakeholders. According to Asare (2024), technical capacity is the cornerstone of an organization's ability to thrive in a rapidly evolving world. It involves having a skilled workforce, modern infrastructure, and the flexibility to adapt to changing technologies. Organizations that invest in and nurture their technological capacity are better positioned to succeed, innovate, and meet the needs of their stakeholders in the long run (Amy, Sithole, & Buchana, 2022).

Technology integration in the value chain is critical for boosting firm performance (Abdallah et al., 2021). Value chain management integrated with technology organizes company activities such as procurement, manufacturing, transportation, and distribution to ensure that the finished product gets delivered to the customer and that companies improve sales volume and profitability (Ning & Yao, 2023). According to (Helo & Shamsuzzoha, 2020), supply chain management (SCM) has a substantial impact on corporate performance since it covers the flow of information, resources, products, and money inside and across the firm

2.3.6 Performance of Food and Beverage Manufacturing Firms

Organizational performance refers to the extent to which an organization achieves a set of pre-defined targets unique to its mission, vision, and goal. Firm performance in profitability is defined as the earnings attained by companies on investment

measured using return on assets (ROA) and/or the return on Sale (ROS) return on investment and return on equity (Sudiyatno, Puspitasari, Nurhayati & Rijanti, 2021) resource-based view theory of the firm. The conceptual model postulates that a business's performance is measured in firm profitability. In an administrative setting, profitability is the amount of yield or cash a business generates in its restricted possessions (Sedliačiková et al., 2021). Firm financial performance can satisfy investors and be represented by profitability, growth, and market value. These three aspects complement each other. Profitability measures a firm's past ability to generate returns. Chine (2021) established that strategic sourcing predicted a reduction in costs and risks while increasing operational efficiency, both in the short term and long term, fostering the creation, development, and delivery of value to the market faster than its competitors.

Firm market share is the percent of the market in terms of units or revenue accounted for by the firm. Scholars and practitioners interpret market share as a measure of how well a company has been able to predict market dynamics and the needs of the targeted customers (Bhattacharya, Morgan, and Rego, 2022). Market share is also used to measure a firm's performance the increase in firm sizes in the customer base and the increase in asset base. The market value represents the external assessment and expectation of firms' future performance. It should have a correlation with historical profitability and growth levels but also incorporate future expectations of market changes and competitive moves (Hsu, 2022). Firm market share can be enhanced by integrating technologies into operations to increase its size relative to market competitors. The current study's approach to measuring firm performance in manufacturing firms focused on financial measures such as profitability and returns and non-financial measures such as market share and sale performance in operations. Supporting this view, Ajoke, Iortimbir, Taiwo, and Omotayo (2019) opined that order processing and inventory controls contributed to a significant increase in organizational effectiveness and sale volumes in milling companies in Nigeria.

Sales performance combines sales effectiveness and the company's ability to win each stage of customer buying processes. This results in sales volume and market share made up of profit and return on investment (Chi, 2023). Hsu, 2022) believes

that sales performance is a direct inducement that provides an additional value or incentive for the goods to the sales force, distributors, or consumers with the primary goal of generating an immediate sale. They are a tool for overall company performance (Osio & Ehi, 2023). According to Muwairwa (2019), sales volume showed an image of the level of customer future process of growing opportunities; the stress is on sales organizations to meet ever-greater revenue targets. Technology deployment in the value chain is critical in fostering quality production, efficient operations, and information sharing, which contribute to achieving firm performance goals. According to Abdallah et al. (2021), integrating technology in Operations Management and logistics improves sales performance in manufacturing enterprises.

2.4 Empirical Review

An empirical review refers to a critical examination and analysis of existing research studies based on empirical data data obtained through observation, experimentation, or direct experience. This section reviewed how study variables were explained in other studies and their effects on the performance of food manufacturing firms. The study focused on reviewing material management, outbound logistics, operations management, inbound logistics, and Technological integration on the performance of food and beverage manufacturing firms.

2.4.1 Material Management

Thuku and Kombo (2019) determine the effect of value chain management practices on the performance of medium and large-scale retail outlets in Nakuru County. The study was based on the resource-based view theory. The study employed a correlational research design. The population of the study was 43 medium and large-scale retail outlets. A census study was conducted among 43 medium and large-scale retail outlets in Nakuru County, Kenya. Primary data was collected using close-ended questionnaires. The results revealed a positive and significant relationship between value chain management practices and organizational performance. The results revealed a positive significant relationship between supplier relationships and organizational performance. The findings also revealed a significant positive relationship between material management activities and organizational

performance. The results also revealed a significant positive relationship between customer relationships and organizational performance. Further, the results demonstrated that the joint effect of supplier relationships, internal value chain activities, and customer relationships explained more significant variance in organizational performance than that of internal value chain activities alone. It is concluded that while internal value chain activities need to be the key vision of value chain management practices in firms, all value chain management practices dimensions should be combined for a greater increase in organizational performance

An empirical review by Chompunuch, Apsorn, and Kachonkitiya. (2022) sought to develop and validate a causal relationship model between value chain management and business performance with empirical data and determine the value chain management approaches to enhance business performance. This research was carried out using both quantitative and qualitative research methods. Data was collected through a questionnaire distributed to 308 OTOP entrepreneurs in Thailand and an in-depth interview with 20 OTOP entrepreneurs. Quantitative data analysis was performed using basic statistics and structural equation model analysis, while qualitative data analysis was done using content analysis and then presented in descriptive writing. This revealed that value chain management activities inbound logistics, operations, outbound logistics, marketing and sales, and services contribute to firm performance.

Goulap et al. (2022) assess the impact of materials management on the profitability of manufacturing companies in Ethiopia with a particular reference to Walia Steel Industry PLC. The study's main objective was to detect materials management problems that can result in achieving organizational profitability if appropriately corrected. Relevant data was gathered through self-administered structured questionnaires and open-ended questions, and analysis was made based on primary data generated via a five-point Likert scale using SPSS version 23. A cross-sectional data model was used in the study. The study adopted explanatory and descriptive research designs integrated with commonly used mixed research methods. The validity and reliability of the study were also tested using SPSS V-23. The results revealed that effective materials management dimensions, such as strategic sourcing

and interdepartmental collaboration among materials-related departments such as inventory, procurement, and storage management, contributed to the profitability of the companies

A study by Essel (2021) assessed the relationship between materials management practices and a firm's performance in Ghana Using Dominance Analysis. This study aims to empirically examine the effect of materials management on a firm's performance by exploring employee views and utilizing a firm's financial statement data within the Ghanaian context, focusing on Fan Milk Limited, a listed manufacturing firm in Ghana. A cross-sectional research design was espoused for the study, utilizing questionnaires completed by 240 respondents selected via simple random sampling. SPSS version 25.0 was utilized for data analysis, which included descriptive statistics, principal component analysis, exploratory factor analysis with varimax rotation, reliability/validity analysis, and multiple regression aided with relative importance analysis via dominance analysis. The study found significant positive relationships between materials management practices and a firm's performance. Dominance analysis further revealed that materials requirement planning and control was the most important predictor of a firm's performance, while ergonomics was the least important predictor of performance. The established managerial recommendations should be viewed critically while the manufacturing firms are being managed.

The study by Ifeyinwa (2022) explores the relationship between material management and organizational productivity in plastic manufacturing companies in Anambra State, Nigeria. Specifically, the study investigated the relationship between material planning strategy, material handling, material procurement strategy, and organizational productivity in Plastic manufacturing companies in Anambra State. Relevant conceptual, theoretical, and empirical literature was reviewed, taking cognizance of the problem and the study's hypotheses. The study was anchored on Inventory Management Theory. A survey research design was adopted. The study population comprised 1648 employees in Plastic manufacturing companies in Anambra State, Nigeria, while the sample size consisted of 321 employees in Plastic manufacturing companies. Borg and Gall were used to obtain the sample size. The

face and content validity methods were used to ensure the instrument's validity. The reliability of the instrument was achieved through the test re-test method. A simple percentage analysis was employed to answer the research questions. Pearson Product Moment Correlation Coefficient analysis was used to test the hypotheses. It was discovered that. Material planning strategy has a significant relationship with organizational productivity in plastic manufacturing companies. Material handling positively correlates with organizational productivity in plastic manufacturing companies. Material procurement strategy has a significant relationship with organizational productivity in plastic manufacturing companies in Anambra State. Therefore, the study concluded that material management positively correlates with organizational productivity.

Nyongesa and Shale (2019) studied the Influence of Material Management on the Performance of Large Manufacturing Firms in Nairobi City County, Kenya. The study adopted the descriptive research design; research design is defined as a plan, structure, and strategy of investigation conceived to obtain answers to research questions and control variance. The unit of observation analyses of this study consisted of officers who are assigned warehouse responsibilities comprising warehouse middle-level managers. The study used a stratified random sampling procedure to select respondents. A stratified random sampling procedure is a probability sampling procedure in which the target population is separated into mutually exclusive homogenous segments (strata). The close-ended question provides more structured responses to facilitate tangible recommendations. The closed-ended questions were used to test the rating of various attributes, which helped reduce the number of related responses to obtain more varied responses. The collected research data was checked for errors and omissions, coded, defined, and entered into Statistical Package for Social Science (SPSS Version 23). Descriptive statistics was used to portray the sets of categories formed from the data. The mean, standard deviation, and variance on the dependent and independent constructs were used to show how clustered or dispersed the constructs were. The study used multiple linear regression analysis to test the statistical significance of the various independent variables in testing the significance of the model. The coefficient of determination (R2) was used to measure the extent to which the variations of various

factors on the outsourced distribution services explain the variation in the implementation of supply chain performance. The study established that the Basic functionality of materials management includes various factors such as supply, material pricing, and usage that contribute to firm performance in large manufacturing companies in Kenya.

2.4.2 Outbound Logistics

Kinisa (2019) assesses precursors of logistic distribution performance in manufacturing industries in Tanzania. The specific objectives of this study are to determine the problems affecting the outbound logistics of Miku Investment Limited, the employees' skills in the outbound logistics of pipelines, and the strategies used to improve the outbound logistics of Miku Investment Limited. The research Design is considered a research method because it tries to find the relationship between the problems. The data collection method is an interview, the sample size used in the survey is 50 participants, and the non-probability method is sampling. The validity assessment method is the examination of expert opinion to verify the reliability of the measurement. The data analysis method combines qualitative and quantitative analysis, showing that outbound logistics performance was influenced by compliance, identified legal issues, and technological challenges.

An empirical study by Ajoke, Iortimbir, Taiwo, and Omotayo (2019) examined the influence of outbound logistic operations on the performance of firms. The study focused on transport and inventory management linked to organization effectiveness and productivity as a measure of performance. The study adopted a descriptive survey research design. Data was collected using a questionnaire from 115 Dangote Flour Milling Company officers in Nigeria. Descriptive and inferential analysis techniques were deployed. From the findings, order processing and inventory controls significantly increased organizational effectiveness and productivity in milling companies. Correlation analysis revealed a significant, positive, and strong relationship between outbound logistics operations and the performance of milling companies in Nigeria.

Kisilu and Gatari (2021) conducted a study on the effect of strategic logistics outsourcing on the organizational performance of the manufacturing firms listed at the Nairobi Security Exchange in Kenya. The population of the study in this research was 72 companies operating in Kenya, and the study was a census survey since the population was small. The study used primary data collected through a structured questionnaire from Logistics and operations managers or their equivalents, administered by the 'drop and pick' method. The data was analyzed using descriptive statistics, with the main analysis tools being frequencies, mean and standard deviation, and Multiple linear regression by utilizing the Statistical Package for Social Sciences (SPSS). The results established that the firms opted to outsource their services due to its advantages and its possible influence on operational performance, as it enables the firms to focus on their core competencies. The results indicated that through order processing outsourcing, the company attained a reduction in costs, improved earnings, and improved market share.

Ihunwo and Ikegwuru (2023) studied the influence of logistics outsourcing on organizational performance in the oil and gas industry in River State, Nigeria. This study was set to examine the relationship between logistics outsourcing and oil and gas project performance in Nigeria. Literature was reviewed, emphasizing the relationship between the variables, theoretical literature, and empirical literature. The unit of analysis consisted of all managing directors of the 71 registered oil and gas players who gave information on oil and gas organizational performance and logistics outsourcing. Descriptive and regression analysis was done. Data was generated using questionnaires on the variables for oil and gas players. Responses were statistically analyzed using descriptive statistics, product-moment correlation, and regression analysis. The finding revealed that outbound logistic outsourcing contributes to an increase in sales volumes, increases the customer base, and improves the company's profitability.

Chine (2021) studied the Impact of strategic Outsourcing on Organizational Performance. The study employed a descriptive research design. Out of the study population of 1,000 company employees, a sample size of 90 was taken, whose elements were selected using a simple random sampling technique. Questionnaires

were used as the primary data collection instrument. The response rate was 91 percent, with 82 questionnaires filled adequately out of the 90 questionnaires issued. Data was analyzed using descriptive statistics, correlation, and regression analysis and then presented in tables. The findings of the study were that cost-driven outsourcing, innovation-driven outsourcing, and focus-driven outsourcing had a significant influence on organizational performance at Bidco Africa Ltd. The study found that cost-driven outsourcing improved organizational performance by reducing costs and risks while increasing operational efficiency in the short and long term. Further, the study found that innovation-driven outsourcing improved organizational performance by enabling it to create, develop, and deliver value to the market faster than its competitors. The success of innovation-driven outsourcing, however, was found to be largely dependent on cost control and core competencies focus; hence, it must be evaluated carefully. Finally, the study found that focus-driven outsourcing assists a company in freeing up its resources to concentrate on its core business, which leads to improved organizational performance.

Atnafu et al. (2024). conducted a study on inventory management practices on firms' competitiveness and organizational performance in manufacturing companies, a case of Cinerwa in Rwanda. The study focused on assessing the extent to which inventory management, material handling, packaging, and dispatching contribute to the performance of Cinerwa Limited in Ruzisi District in Rwanda. The study also sought how automation and optimization contributed to the company's performance. A descriptive survey research design was adopted. The study population was 285, with a sample size of 166. Data analysis was done using descriptive statistic mean, standard deviation, inferential statistics, regression, and correlation. From the results, material handling, order processing, automation, and optimization contributed significantly to increasing profitability levels, improving sales, and attracting more customers.

2.4.3 Operations Management

Gadwe and Sangode (2019) studied the impact of operations management activities on operational performance in service organizations. From this study, it is observed

that in the service of organizations, all operations management activities like scheduling, measurement, service processes, logistics, service, support, facility, features, and efficiency are implemented to different extents. It was found that highly implemented activities include scheduling, service, features, and service processes in service organizations. It is realized that customer services, processing time, speed, work scheduling, staff scheduling, responsiveness, on-time delivery, quality control, maintenance, resource capacity planning, just-in-time, and procurement purchasing are highly implemented operations management activities.

According to Kuria and Kariuki (2022) An empirical study by value chain analysis on the performance of floriculture exporting firms in Kenya. The specific objectives were to determine the effect of logistics capabilities and operations capabilities on the performance of floriculture exporting firms in Kenya. The study was anchored on the transaction cost theory and resource-based view theory. The study employed a descriptive research design. The target population was 240 staff in the floriculture exporting firms' logistics, finance sales, and marketing departments. Taro Yamane sampling formula was used to obtain a sample of 150 staff. The study used simple random to obtain the sample size. Questionnaires were used for data collection. A pilot study was conducted with 15 respondents, representing 10% of the sample. Construct and content validity were used. Reliability was tested using Cronbach's Alpha Coefficient. Data was analyzed quantitatively using SPSS version 26 through descriptive (frequency, percentage, mean) and inferential statistics (correlation and regression). Findings showed that there is a moderate and significant correlation between logistics capability and firm performance ($r= 0.441$, p-value=0.004), and a small and significant relationship between operations capability and firm performance was ($r= 0.247$, p-value=0.014). The results revealed that cost savings in logistics operations such as inventory control and optimizations, transportation, and warehousing operations contributed to increased companies' profits.

Chompunuch and Apsorn Kachonkitiya (2022) determined the relationship between value chain management and business performance with empirical data and determined the value chain management approaches to enhance business performance. This research was carried out using both quantitative and qualitative

research methods. Data was collected through a questionnaire distributed to 308 OTOP entrepreneurs in Thailand and an in-depth interview with 20 OTOP entrepreneurs. Quantitative data analysis was performed using basic statistics and structural equation model analysis, while qualitative data analysis was done using content analysis and then presented in descriptive writing. The study revealed that operations process optimization, product scheduling, capacity planning, and product scheduling contributed to increased firm market share, sales performance, and profit margin.

Plamen, Pavel and Ivan. (2023) carried out a study on an optimization model for production scheduling, taking into account preventive maintenance in an uncertainty-based production system. The study adopted a sensitivity analysis modelling approach. The study revealed that optimized execution time of all orders, and specifically the production lines usage - their optimal load and non-use of unnecessary machines contributed to cost savings and improved efficiency of the production process and led to improving the financial performance of the firms.

Bosire (2018) conducted a study on the effects of Operations Management on organizational performance in the automotive industry in Kenya: a case study of Scania East Africa Limited. The study employed a descriptive survey research design to study the effects of operation strategies on organizational performance in Kenya's automotive industry. It focused on 97 employees of Scania East Africa Limited. Descriptive statistics were in percentages, frequencies, mean, and standard deviation. Inferential correlation was used. Data was presented in the form of frequency tables, charts, graphs, and written reports. The study findings showed a positive correlation between customer-driven strategies, product development strategies, personnel development strategies, competitive advantage strategies, and organization performance. The study concluded that organizations used various customer strategies that attract more new customers, hence achieving a wider range of markets, improved performance and loyalty to the organization, increased product flexibility, and superior customer value delivery positively impact organizational performance.

Walker and Strickler (2020) conducted a study on the impact of operations management practices on firm performance: An Empirical Analysis of Vietnam's Mechanical Firms. The statistical methods used are descriptive statistics, reliability analysis, and regression analysis for hypothesis testing. The findings present, firstly, the extent of operations management practices implemented in Vietnam's mechanical firms is relatively high; secondly, the impact of these practices on firm performance was positive. Equipment layout and supplier quality management are positively and significantly related to financial performance. In contrast, equipment layout, JIT delivery by supplier, Kanban, cleanliness and organization, and information and feedback are positively and significantly related to non-financial performance. This result suggests that mechanical firms in Vietnam should employ these practices to maintain and improve performance and gain competitive advantages.

2.4.4 Inbound Logistics

Thi et al. (2022) studied how inbound logistics capability influences supply chain resilience in the textile industry in Vietnam. The study adopted a conceptual framework based on a resource-based view. The study was assessed using partial least squares structural equation modelling. Primary data was collected from 215 Vietnamese textile enterprises from December 2021 to March 2022. From the results, inbound logistics capabilities improved supply chain resilience as the companies increased profitability, fostered market share, and increased sales performance. Building supply chain resilience was found to be a key predictor of the performance of textile enterprises in Vietnam.

An empirical study by Tembo and Mutono-Mwanza (2024) assessed the influence of market information, packaging, transportation, storage, processing linkage, quality, and regulations of food waste along the vegetable supply chain at Soweto Market. This research was envisioned to contribute to the existing knowledge on reducing food waste along the vegetable supply chain. The study adopted a deductive research approach and employed the descriptive research design. Empirical data were collected using survey questionnaires distributed to 110 smallholder farmers at

Soweto Market who farm, package, transport, store, and sell for themselves. Data analysis involved descriptive statistics, factor analysis, and regression analysis using the Software Package for Social Sciences (SPSS). The study intended to establish the type of food waste. It was restricted to understanding how factors such as market information, packaging, transportation, storage, processing linkage, quality, and regulations as independent variables cause food waste along the vegetable supply chain. The results revealed that inbound logistics contribute to food and beverage supply sustainability. It was also found that packaging contributed highly to reliability and internal consistency in the supply of products to the market. It also revealed that processing linkage has a significant favorable influence on adequate storage and control of supplies, hence improving firm performance. These findings contribute to reducing food waste along the vegetable supply chain, ultimately improving food sustainability.

An empirical study by Bha and Yaday (2018) examined the correlation between inbound logistics and the performance of handcraft firms; in order to determine the relationship between inbound logistics and performance, the primary measures of both broad components were considered for inbound logistics, market factors (MF), financing (FIN) and quality control (QC) were considered as essential variables, while productivity, efficiency, and flexibility were taken into account when analyzing performance specific aspects. Furthermore, it is important to establish a procedure to evaluate the impact of independent variables (MF, FIN, and QC) on performance. The relationship between dependent and independent variables was analyzed using SPSS (regression analysis).

Rahman and Naresuan (2019) examined the relationship between inbound logistics capability and firm performance in manufacturing companies in Thailand. A quantitative method and Confirmatory Factor Analysis (CFA) were used to test the relationship between observed variables and latent constructs. This research employed SPSS version 20 And the Structural Equation Model (SEM) based on AMOS version 23 to analyze the data surveyed in the 120 garment factories in the export processing zone and domestic factories of Dhaka, Bangladesh's capital city. The findings revealed that inbound logistics, receiving of goods, storage capacity,

and inventory control contribute significantly to return on asset, reduction in cost of operations, and improved profitability and market share. The results also revealed a negative relationship between inbound logistics and company customer satisfaction.

Atnafu, Balda, and Liu (2018) examined the impact of inventory management practices on firms' competitiveness and organizational performance. Data for the study were collected from 188 micro and small enterprises (MSEs) operating in the manufacturing sub-sector. The relationships and hypotheses proposed in the conceptual framework were tested using structural equation modelling (SEM). The results indicated that higher inventory control levels can lead to an enhanced competitive advantage and improved organizational performance, as indicated by increased profit earnings. Chami (2019) evaluated the impact of the inbound logistics function on the competitive performance of a manufacturing firm in Tanzania. Both descriptive and inferential analysis were used to examine the data. The research indicates that the procurement system at TOL firms involves a high level of personnel competency as well as effective participation from other stakeholders, including suppliers and user departments. The organization also adheres to effective resource allocation. Dar es Salaam and Mbeya both have large, up-to-date TOL warehouses. For stock control, the company uses automotive inventory systems like ERP. A sufficient transportation fleet, followed by cost-cutting, also affects competitive performance. A significant amount of productive results, cost savings, customer satisfaction, and quick replies (JIT) were seen.

2.4.5 Technological Integration

An empirical study by Wang and Prajogo (2024) Based on the resource-based view (RBV) theory, examined how supply chain digitalization affects firms' performance by enabling firms to build supply chain agility and innovation capability. Drawing from the dataset of 271 firms in the United Arab Emirates (UAE), we used structural equation modelling to validate the models. Mediation and moderation analyses were performed to test the research hypotheses. The results suggest a positive correlation between supply chain digitalization and a company's performance, fully mediated by both supply chain agility and innovation capability. The interplay between supply

chain agility and innovation capability has the potential to result in unfavorable outcomes for a firm's performance. These results provide valuable insights into supply chain management during digital transformation.

An empirical study by Asare (2024) examined the relationship between logistics integration and supply chain performance and the function information sharing plays in that connection among supply chain partners in a vital section of Ghana's economy. The study employed a quantitative approach and adopted the explanatory research designs in the investigation. The research population targets used senior management staff of energy firms operating within the Greater Accra Region. The study used a convenience sampling approach to select a total of 111 employees from the population. The structured survey questionnaire was used as a data collection instrument to gather primary data from respondents. The data techniques used were descriptive and inferential analysis and structural equation modeling using IBM SPSS (version 26) and Amos version 23. Findings: The study found that logistics integration has a significant and positive effect on supply chain performance; further information sharing correlates positively and significantly with supply chain performance; and finally, information sharing does not have any influence on the relationship between supply chain performance and logistics integration.

Nurazwa et al (2019) studied the relationship between technological capability and manufacturing performance. Stratified random sampling was employed, and 302 questionnaires were distributed to the respondents from small to large manufacturing firms in Malaysia. Pearson correlation analysis was employed to test the hypothesis. The study results show that the relationship between technological capability and manufacturing performance is significant and positive. This study proved there is a connection between the variables. Further investigation is required to understand the impact of technological capability on manufacturing performance and to understand deeper the influences of differences by size of firms and industry characteristics

Amy, Sithole, and Buchana (2022) analyzed the impact of technological innovation on productivity in South African manufacturing firms using direct measures of innovation. The study opined that South Africa is lagging behind other emerging

market countries regarding technological progress and innovation efforts, which are deemed insufficient, particularly in private firms. While studies have measured the impact of R&D (as an innovation input) on productivity, the direct impact of innovation success on productivity has not been estimated in South Africa before. The business innovation survey (BIS) provided data that allowed us to estimate these direct effects, enabling the study to contribute to the South African literature research. The study estimated the impact of technological innovations on firm productivity using a sample of manufacturing firms from the BIS 2014–2016 data. Using a variation of the CDM model, the study found that introducing product or process innovations significantly positively affects productivity in South African manufacturing firms.

Kimani (2021) conducted a study on the impact of information technology on organizational performance: A case of population services in Kenya. A descriptive survey was used to achieve the objectives of the study. Primary data was collected using a semi-structured questionnaire. The population for this study comprised the entire PS Kenya staff, which was 438. The questionnaire was administered electronically for data collection, out of which 311 respondents responded to the study, resulting in a response rate of 71 percent, which was considered a sufficient representation of the organization. The study findings revealed that most respondents had various IT company devices at their disposal to enable them to perform their duties. The study findings also revealed that there was a positive relationship between the level of IT use and organizational performance at Population Services Kenya. The study results indicated that IT use explains 82.4% of organizational performance at PS Kenya

Monika et al. (2020) researched the impact of technology adoption on organizational productivity. Research design, data, and methodology: An explanatory research design with a quantitative research method was employed, and data was collected using a self-administered online and an offline survey. The sample consisted of 300 IT managers and senior-level executives' production and service teams in leading IT companies in Malaysia selected using snowball sampling. Normality and reliability assessment were performed in the first stage utilizing SPSS 28, and Confirmatory

Factor Analysis (CFA) was performed with maximum likelihood estimation to assess the internal consistency, convergent validity, and discriminant validity. Finally, the Structural Equation Model (SEM) and path analysis are conducted using AMOS 22. Results: The research findings demonstrated that technological change and IT infrastructure positively and significantly impact the organization's profitability and sales volume. At the same time, IT knowledge management significantly but negatively affects the organizational productivity of IT companies in Malaysia.

2.4.6 Performance of Food and Beverage Manufacturing Firms

A study by Osio and Ehi (2023) examines the relationship between technology integration in market strategies and the sales performance of manufacturing companies in Delta State. The study population was 460, and it included both SMEs and large manufacturing companies. Data was gathered through the use of a questionnaire and analyzed using descriptive and inferential statistics, as well as Simple percentage, frequency count, mean, and standard derivation. The hypothesis was tested through the use of Pearson product-moment correlations. Finding from the results showed that there was a significant relationship between cause marketing strategies and customer loyalty. Findings The third hypothesis tested also displayed a significant relationship between logistics marketing strategy as also revealed in the volume of sales volume among the manufacturing companies; this equally shows that when the manufacturing companies maintain a good logistics marketing strategy, their sales volume would increase and positively affect sales performance. MRP generates purchase orders that influence the availability of materials needed, achieving efficiency in production processes, reduction in downtime, and optimization of resources contribution in sale volumes and profitability level.

Kanyi and Litunya (2021) conducted research on the relationship between value chain activities and performance in multinational manufacturing companies in Nairobi. The study adopted a cross-sectional descriptive survey intended to establish the activities that constitute the value chain and the extent to which these activities affect performance in the beer manufacturing industry in Kenya. The

study's target population was 47 value chain professionals, managers, and heads of Coca-Cola Ltd in Kenya. Primary data was collected using a semi-structured questionnaire administered by drop-and-pick methods. Data from questionnaires was summarized, coded, tabulated, and analyzed. Editing was done to improve the quality of data for coding. Coded data was then fed into the Statistical Package for Social Sciences (SPSS) version 21. Linear Regression Analysis was used to investigate the relationship between the variables and the organizational performance of manufacturing companies. From the study findings, outbound logistics, operations processes and utilization of information technology, effective human resources management, efficient firm infrastructure, and continuous improvement contributed to the higher sales volume of multinational corporations in Kenya.

An empirical study by Muwairwa (2019) examined determinants of manufacturing industry sales volume, focusing on Nile Breweries Limited in Njeru, Jinja district. The study's independent variables included internal factors, external factors, administrative resourcefulness, and marketing strategies, while the dependent variable was sales performance. Stratified and simple random sampling procedures were used to select respondents from the company's marketing, sales, distribution, and other departments. A self-administered questionnaire approach was used in data collection, and of the 142 questionnaires, 136 were returned. The data collected was analyzed using descriptive analysis at the univariate level and cross-tabulation analysis at the bivariate level using the SPSS version 20 software. The findings revealed that administrative resourcefulness, material management, and technological integration contribute to sales performance in manufacturing companies, among others. It was also observed that creating new brands and more attractive products of higher selling power has a reward to increase the motivation of members to increase sales.

This study by Ebuzoeme (2024) examined the relationship between product, price, place, and promotion strategies and sales volume of food and beverage manufacturing firms in Nigeria. The study adopted a survey research design. Two hundred and seventy-four employees of a food and beverage manufacturing company

in Lagos State were studied. Data were collected in a semi-structured questionnaire. Descriptive statistics and inferential statistics were used to establish the relationship between marketing strategies and sales performance. The finding revealed the deployment of product, price, place, and promotion strategies. Resulted in an increase in the volume of sales, market share, and the increase in the number of customers. The study further revealed that using electronic channels in marketing enhances sales in the companies, resulting in firm performance. Marketing strategies explained a 98.6 percent variation in sales performance.

Gadwe and Sangode (2019) established that effective operations management scheduling, measurement, service processes, logistics, service, support, facility, features, and efficiency are implemented to different extents, contributing to processing time, speed, work scheduling, staff scheduling, responsiveness, on-time delivery, quality control, maintenance, resource capacity planning, just-in-time, and procurement purchasing are highly implemented operations management activities.

Mazikana (2023) critically reviewed past empirical studies on the effect of value chain management on firm performance. The study revealed that operations management, outbound logistics, and material management predicted positive improvement in delivery times of products and services, quality control, maintenance, resource capacity planning, just-in-time, and efficient inventory control, contributing to organizational profitability level

2.5 Critique of the Existing Literature

The empirical review has demonstrated that material management is linked to firm performance in manufacturing companies, according to Chompunuch, Apsorn, and Kachonkitiya (2022) Management value chain management activities inbound logistics, operations, outbound logistics, marketing and sales, and services contribute to firm performance. Other empirical studies, such as Goulap et al. (2022) and Essel (2021), revealed that materials management dimensions such as strategic sourcing and interdepartmental collaboration among materials-related departments such as inventory, procurement, and storage management contributed to the profitability of the companies. Further review by Ifeyinwa (2022), Material procurement strategy

has a positive significant relationship with organizational productivity in a plastic manufacturing company in Anambra State in Nigeria. Goulap et al. (2022) assess the impact of materials management on the profitability of manufacturing companies in Ethiopia with a particular reference to Walia Steel Industry PLC. In Kenya, Nyongesa and Shale (2019) revealed that material pricing and usage contribute to firm performance in large manufacturing companies in Kenya. The past studies on material management focused on different contexts, different concepts, and geographical settings, while the current study focuses on material management and performance of food and beverage manufacturing firms in Kenya.

On outbound logistics, empirical reviews such as Ajoke, Iortimbir, Taiwo, and Omotayo (2019) examine the link between outbound logistic operations on the performance of Dangote Flour Milling Company in Nigeria and a study by Atnafu, et al. (2024) asserted that inventory management practice on firms' competitiveness and organizational performance in manufacturing companies, a case of Cimerwa in Rwanda. Empirical studies such as those by Gadwe and Sangode (2019) conducted a study on the impact of operations management activities on operational performance in service organizations. The study focuses on operation management and performance. However, this study was done in the service industry and not in food and beverage manufacturing companies in Kenya. The empirical study by Chompunuch and Apsorn Kachonkitiya (2022) determined the relationship between value chain management and business performance with empirical data. It determined the value chain management approaches to enhance business performance and revealed that operations process optimization, product scheduling and capacity planning, and product scheduling contributed to increased firm market share, sale performance, and profit margin. Walker and Strickler (2020) studied the impact of operations management practices in Vietnam's Mechanical Firms. This study focuses on operation management and competitive advantages in Vietnam, while the current study focuses on operation management and organizational performance in food and beverage companies in Kenya

An empirical study by Tembo and Mutono-Mwanza (2024) assessed the influence of market information, packaging, transportation, storage, processing linkage, quality,

and regulations of food waste along the vegetable supply chain at Soweto Market. Empirical studies have revealed that Outbounds logistics are critical in achieving firm performance. Studies such as Kinisa (2019), Ajoke, Iortimbir, Taiwo, and Omotayo (2019), and Kisilu and Gatari (2021) emphasized that order processing and inventory controls contributed to a significant increase in organizational effectiveness and productivity in milling companies. Further, Ihunwo and Ikegwuru's (2023) application of outbound logistic outsourcing contributed to an increase in sale volumes, increased customer base, and improved the company's profitability level, while Chine (2019) and Hura et al. (2024)reported cost cost-driven outsourcing, innovation-driven outsourcing, and focus-driven outsourcing had a significant influence on organizational performance at Bidco Africa Ltd while material handling, order processing, automation and optimization contributed significantly to increase profitability level, improve sales and attraction of more customers.

On inbound logistic and organizational performance, Empirical studies such as Thi et al. (2022) and Tembo and Mutono-Mwanza (2024) focused on how inbound logistics capability influences supply chain resilience in the textile industry in Vietnam, inbound logistics capabilities contributed to improving supply chain resilience as the companies increase profitability, foster market share and increase sale performance. Along the same line, Bha and Yaday (2018) and Rahman and Naresuan (2019) affirmed that inbound logistics, receiving of goods, storage capacity, and inventory control contribute significantly to return on assets, reduced cost of operations, and improved productivity. The current study sought the relationship between inbound logistics and firm performance in food and beverage manufacturing firms in Kenya.

With advancements in technological innovation, manufacturing companies are shifting to value chain management in an effort to achieve expected performance goals. Empirical review Wang and Prajogo (2024) and Asare (2024) asserted that logistics integration with technology enhances the achievement of supply chain performance. Other reviews, such as Nurazwa et al. (2019) and Amy, Sithole, and Buchana (2022), asserted that introducing a product or process technological innovations significantly positively affects productivity in South African manufacturing firms. In Kenya, Kimani (2021), IT use contributed to organizational

performance at public sector organizations in Kenya. It was evidence that the role of technological integration in value chain management practices and the performance of food and beverage companies has not been exhausted, especially in Kenya. This motivates the current document to determine the moderating effects in the relationship between value chain management practices and the performance of food and beverage manufacturing companies in Kenya.

2.6 Research Gaps

Although various studies have been conducted on the performance of food manufacturing firms, these studies were limited to different contexts, concepts, and methodologies applied in different geographical settings. hence generalizing the findings to the current study is impossible.

Reviewing past studies like Ajoke, Iortimbir, Taiwo, and Omotayo (2019) linked value chain management practices such as operation management and logistics activities, customer relationships, and inventory management to organizational performance. Also, Chompunuch and Apsorn Kachonkitiya (2022) asserted that value chain management practices such as inbound logistics contribute to business performance in manufacturing companies in Thailand. Gadwe and Sangode (2019) studied the impact of operations management activities on operational performance in service organizations. It is seen that customer services, processing time /speed, work scheduling, staff scheduling, responsiveness, on-time delivery, quality control, maintenance, resource capacity planning, just-in-time, and procurement purchasing are highly implemented operations management activities. Rahman and Naresuan (2019) examined the relationship between inbound logistics capability and firm performance in manufacturing companies in Thailand. The results also revealed a negative relationship between inbound logistics and company customer satisfaction. Thi et al. (2022) studied how inbound logistics capability influences supply chain resilience in the textile industry in Vietnam. The results showed that inbound logistics capabilities improved supply chain resilience as the companies increased profitability, fostered market share, and increased sales performance. Building supply chain resilience was found to be a key predictor of the performance of textile

enterprises in Vietnam. Atnafu et al. (2024) studied inventory management practices on firms' competitiveness and organizational performance in manufacturing companies, a case of the camera in Rwanda. From the results, material handling, order processing, automation, and optimization contributed significantly to increasing profitability levels, improving sales, and attracting more customers. Chine (2021) studied the Impact of strategic Outsourcing on Organizational Performance at Bidco Africa Ltd. The study found that focus-driven outsourcing assists a company in freeing up its resources to concentrate on its core business, which leads to improved organizational performance. A study by Osio and Ehi (2023) examines the relationship between technology integration in market strategies and the sales performance of manufacturing companies in Delta State. MRP generates purchase orders that influence the availability of materials needed, influence achieving efficiency in production processes, reduce downtime, and optimization of resources contribution in sale volumes and profitability level.

In Kenya, there has been a paradigm shift in focusing on value chain management practices to achieve performance in food and beverage companies that exhibited varying performance levels. This study sought to establish the relationship between value chain management practices and the performance of food and beverage manufacturing companies in Kenya to resolve performance mix cases in the subsector. Ihunwo and Ikegwuru (2023) studied the influence of logistics outsourcing on organizational performance in the oil and gas industry in River State, Nigeria. An empirical study by Kuria and Kariuki (2022) value chain analysis on the performance of floriculture exporting firms in Kenya. The results revealed that cost savings in logistics operations such as inventory control and optimizations, transportation, and warehousing operations contributed to increased companies' profits. While the past studies focus on value chain management practices and performance, most have focused on different industries such as floriculture exporting, the textile industry in Vietnam, manufacturing companies, the gas industry, and service industries without focusing on value chain management practices and performance in the food and beverages industry in Kenya.

The conceptualization of the empirical studies reviewed is clear. Atnafu, Balda, and Liu (2018) examined the impact of inventory management practices on firms' competitiveness. Monika et al. (2020) examine the impact of technology adoption on organizational productivity. The research findings demonstrate that technological change and IT infrastructure positively and significantly influence the organization's productivity, while IT knowledge management has a significant but negative effect on it. organizational productivity of IT companies in Malaysia. Also, Osio and Ehi (2023) examine the relationship between technology integration in market strategies and the sales performance of manufacturing companies in Delta State. The findings of the third hypothesis tested also show that there is a significant relationship between logistics marketing strategy as shown in the volume of sales performance among the manufacturing companies; this equally shows that when the manufacturing companies maintain a good logistics marketing strategy, their sales volume would increase and positively affect sales performance. On the other hand, Amy, Sithole, and Buchana (2022) analyzed the impact of technological innovation on productivity in South African manufacturing firms using direct measures of innovation. Using a variation of the CDM model, the study found that the introduction of product or process innovations has significant positive effects on productivity in South African manufacturing firms. Most of the reviewed studies focus on linking value chain management practices, such as Ihunwo and Ikegwuru (2023) linking logistics outsourcing to organizational performance in the oil and gas industry in River State, Nigeria Nyongesa and Shale (2019) linked material management and performance of large manufacturing Firms in Nairobi City County, Gadwe and Sangode (2019) conducted a study on the impact of operations management activities on operational performance in service organizations and Chompunuch, Apsorn Kachonkitiya (2022) assess the relationship between the value chain management and business performance. This study failed to conceptualize the effect of technological integration on the relationship between value chain management practices and the performance of food and beverage processing firms in Kenya.

Methodological research gaps are clear as Kanyi and Litunya (2021) used cross-sectional in conducting research on the relationship between value chain activities

and performance in the multinational manufacturing companies in Nairobi to establish the activities that constitute the value chain and the extent to which these activities affect performance in the beer manufacturing industry in Kenya. Monika et al. (2020) adopted an explanatory research design, Structural Equation Model (SEM), and path analysis, conducted using AMOS 22 to understand the impact of technology adoption on organizational productivity in assessing the impact of technology adoption on organizational productivity. In seeking to understand the impact of technological capability on value chain management and performance in manufacturing firms, Nurazwa et al. (2019) adopted a descriptive survey research design and used Pearson correlation analysis to test the hypotheses. A study by Amy, Sithole, and Buchana (2022) deployed Using a variation of the CDM framework in analyzing the impact of technological innovation on productivity in South African manufacturing firms using direct measures of innovation, while Monika et al (2020) deployed explanatory research design with a quantitative research method and Structural Equation Model (SEM) and path analysis are conducted using AMOS 22 in understanding the impact of technology adoption on organization productivity. The current study deployed a method research approach, used descriptive and explanatory research designs, adopted correlation, and used multiple regression to provide an understanding of the impact of technological integration on the relationship between value chain management practices and the performance of food and beverage manufacturing companies in Kenya.

2.7 Summary of Literature Reviewed

This study was guided by the Queuing Theory, Resource-based View Theory, Systems Theory, theory of constraints, and Unified Theory of Acceptance and Use of Technology. Queuing theory was used to determine the relationship between material management and the performance of food and beverage manufacturing firms in Kenya. In addition, the Resource-based View theory was used in this study to establish the relationship between Outbound Logistics and the performance of food and beverage manufacturing firms in Kenya. Further, system theory was used in this study to evaluate the relationship between operations management and the performance of food and beverage manufacturing firms in Kenya. The theory of

constraints was also used to establish the relationship between inbound logistics and the performance of food and beverage manufacturing firms in Kenya. The unified Theory of Acceptance and Use of Technology was used to assess the moderating effect of Technological integration and the relationship between value chain practices and the performance of food and beverage manufacturing firms in Kenya. The empirical review revealed that material management, Outbound Logistics, Operations management, and inbound logistics have a significant influence on the performance of food manufacturing firms.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter explains the research methods used. It begins with an overview of the research design, research philosophy, target population, sample frame, Sampling Technique and Sample Size, data collection instruments, data collection procedures, pilot testing, and data processing and presentation techniques. Finally, the method of analysis used to test the hypotheses is presented.

3.2 Research Design

Research design is an outline for collecting, measuring, and analyzing the data so conceived as to obtain responses to research questions (Pilche & Cortazzi, 2024). According to Sadock (2021), research design is the arrangement of conditions for the collection and analysis of data in a method that aims to combine relevance to the research purpose with economy in procedure. Mukherjee (2023) clarifies that decisions regarding what, where, when, how much, and by what means concerning an inquiry or research study constitute a research design. Jilcha (2020) posits that research design enables the researcher to allocate limited resources by posing crucial choices in methodology.

The study adopted both descriptive research design and explanatory research design. Descriptive research is used to gather information on the present state of a phenomenon and to characterize "what exists" in terms of variables or circumstances in a given scenario (Haradhan, 2020). Descriptive research design is reliable in answering questions of where, who, how, and when related to the phenomenon under investigation. An explanatory research design investigates relationships and causal links between various variables. The goal of explanatory design is to examine a specific scenario and explain the patterns of connection between variables (Memon et al.,2020)

3.2.1 Research Philosophy

Research philosophy is the foundation of knowledge, and the nature of that knowledge contains essential assumptions about how researchers view the world (Mukherjee, 2023). Research methods are influenced by philosophical orientations such as epistemology. Epistemology attempts to answer the fundamental question, what distinguishes true (adequate) knowledge from false (inadequate) knowledge? Epistemology is concerned with determining the nature of knowledge and the extent of human knowledge (Andrade, 2020). There are three epistemological positions: realism, interpretivism, and positivism (Casteel & Bridier, 2021).

This study adopted a positivist research paradigm. Pilche and Cortazzi (2024) assert that the positivist research paradigm takes the quantitative approach and is based on actual facts, objectivity, neutrality, measurement, and validity of results. The roots of positivism lie particularly with empiricism; that is, all factual knowledge is based on positive information gained from observable experiences, and only analytic statements are allowed to be known as accurate through reason alone. Positivism maintains that knowledge should be based on facts and not abstractions; thus, knowledge is predicated on observations and experiments based on existing theory Jilcha (2020). Epistemological research in the positivist paradigm is how the social world can be investigated as a natural science. Hypotheses have to be tested by empirical approaches. Koul (2018) posits that since the positivist paradigm focuses on discovering the 'truth' through empirical investigation, the quality standards under this paradigm are validity and reliability. The positivist research philosophy was used in this study because it is grounded in theory, it uses quantitative methods, and the findings obtained through positivist research can be generalized to the larger population

3.3 Target Population

The target population is a collection of research components that refers to all members of an actual or imaginary group of people, events, or objects to whom the findings should be applied (Casteel & Bridier, 2021). It can also be described as the set of sampling units or cases that the researcher is concerned with. The target

population, according to Kothari (2018), is a physical representation that contains all the units that could be members of the sample. A population can alternatively be thought of as the whole collection of elements from which the study wants to conclude. Pilche and Cortazzi (2024) define a population as a group of people, objects, persons, or items from which a sample is extracted for analysis and to which generalizations can be made of the whole population. According to KAM (2022), there are 246 food and beverage manufacturing firms in Kenya. These firms are grouped into 8 categories, including Alcoholic beverages and spirits, Bakers and millers, Cocoa, Chocolate and Sugar Confectionery, Dairy Products, Juices / Waters / Carbonated Soft Drinks, Slaughtering, Preparation, and Preservation of Meat, and Salts processing and vegetable oils. Therefore, the unit of analysis was the 246 firms, while the unit of observation was the key informants who had full knowledge of the firm 246 managers. The target population is presented in Table 3.1.

Table 3.1: Target Population

Category	Target population
Alcoholic beverages & Spirits	43
Bakers & Millers	39
Cocoa, Chocolate, and Sugar Confectionery	31
Dairy Products	28
Juices / Water / Carbonated Soft Drinks	40
Slaughtering, Preparation, and Preservation of Meat	30
Salts processing	5
Vegetable Oils	30
Total	**246**

Source: KAM (2022)

3.4 Sampling Frame

The sampling frame is an operationalized representation of the target population and is the group of units from which the sample is recruited. It is the precise group of units often individuals - that are to be solicited for their participation in the study.

Sampling frames may be organized using telephone numbers, names of persons, physical addresses, email addresses, social media groups, organizational lists, or geographical units (Mukherjee, 2023). The nature of the sampling frame is directly related to the sampling method, as the sampling frame is the operationalized structure through which the sample is recruited (Casteel & Bridier, 2021). The study's sampling frame was (KAM, 2022) registered food and beverage manufacturing firms operating in Kenya and had a list of eight main industrial categories.

3.5 Sample Size and Sampling Technique

The sample was reached using the Krejcie and Morgan sample size determination formula (Memon et al.,2020). A representative sample was obtained using below formula. The study's total population was 246 food and beverage manufacturing firms in Kenya. Simple random sampling was used to select 152 respondents from the total population formula used or arrive at the sample size is;

$$= \frac{x^2 NP(1-P)}{(E^2(N-1)) + x^2 P(1-P))}$$

Where:

n=sample size

x^2=Chi-square for the specified confidence level at 1 degree of freedom

N=Population size (246)

P = is the proportion in the target population estimated to have characteristics being studied. As the proportion was unknown, 0.5 was used.

Memon et al. (2020) indicate that using 0.5 provides the maximum sample size and is, hence, the most preferable.

ME=desired margin of Error (Expressed as a proportion)

$$= \frac{1.96^2 246 * 0.5 * 0.5}{(0.05^2 * 246) + (1.96^2 * 0.5 * 0.5)}$$

$$= 152$$

Table 3.2: Sampling Table

Category	Target population	Sample Size
Alcoholic beverages& Spirits	43	27
Bakers & Millers	39	23
Cocoa, Chocolate and Sugar Confectionery	31	19
Dairy Products	28	17
Juices / Water / Carbonated Soft Drinks	40	25
Slaughtering, Preparation, and Preservation of Meat	30	19
Salts processors	5	3
Vegetable Oils	30	19
Total	**246**	**152**

3.5.1 Sampling Technique

The sample is a subset of the population that is selected for a study (Mukherjee, 2023). Sampling is the process of choosing a representative portion of the entire population for a study so that the individual selected represents the large group from which they are selected (Andrade, 2020). The study used a stratified random sampling procedure to select respondents. A stratified random sampling procedure is a probability sampling procedure in which the target population is separated into mutually exclusive homogenous segments (strata). Stratified sampling gave a high level of precision compared to simple random sampling because the variability within the subgroups is lower compared to the variation within the entire population (Mukherjee, 2023).

3.6 Data Collection Instruments

This study used both primary and secondary data. Secondary data refers to information collected, processed, and documented by others for purposes other than the current research or study (Kuphanga, 2024). Data has already been gathered and made available in various forms, such as research reports, government publications, academic journals, databases, and websites (Singpurwalla, 2019). Secondary data was used to measure performance. Primary data was used to measure and analyze the study's qualitative and quantitative data. The study's primary data was obtained using semi-structured questionnaires. This allowed the study to collect quantitative data through structured questions; structured questions were useful as they enabled easy data analysis and reduced the time and resources needed for data collection. On the other hand, the unstructured questionnaires helped the researcher get in-depth responses from the respondents, giving them a chance to provide views and suggestions on the various issues not captured by the structured questions.

Questionnaires are a well-established tool within social science research used for acquiring information on respondents' social characteristics, present and past behavior, standards of attitudes or behavior, and their beliefs and reasons for action concerning the topic under study (Kuphanga, 2024). This data collection tool was preferred because of its appropriateness, especially the use of structured and semi-structured questionnaires, due to its easy administration, implementation, and analysis ability. Also, Hamed (2021) points out that a questionnaire is a cheap tool for data collection and is very effective in collecting information from a large population. Further, the data collected will not be biased as the questionnaire guarantees anonymity. The questionnaires were carefully prepared, appropriate editing was done, and the researcher's supervisors assessed them to ensure their validity and reliability (Singpurwalla, 2019). The questionnaire has two parts. The first part requests the respondent's socio-demographic data; part two has six sections; sections two to five cover the four independent variables, section six covers the moderating variable, and section seven on the dependent variable.

3.7 Data Collection Procedures

The data collection procedure is an approach for gathering and measuring data on elements or variables of interest in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes (Hamed, 2021). The data collection procedure enables the researcher to develop appropriate instruments for data collection and provides instruction for its use to minimize the likelihood of error occurrence. The researcher obtained a letter of confirmation from Jomo Kenyatta University of Agriculture and Technology for the collection of data. A research permit was also obtained from the National Commission for Science, Technology, and Innovation. The data was collected using the drop-off and pick-up-later method, and the questionnaires were collected after one week. This accorded the respondents enough time to answer the questions. The researcher used this method due to the respondents' time availability variances.

3.8 Pilot Study

A pilot study, or pilot test or pre-test, is defined as small-scale preliminary research that is conducted to evaluate time, cost, and feasibility to improve on the design of a particular study before conducting the actual one or full-scale research project (Allen, Robson, & Iliescu, 2023). The researcher carried out a pilot study to test for reliability and validity of the data collection tool. Results from the pilot test helped correct the challenges encountered before undertaking the final study. The pretesting sample comprised 15 respondents, representing 10% of the sample size. Piloting was done in large and small food manufacturing companies that were not part of the final study but have characteristics similar to those of manufacturing firms. The results from the pilot test were not used in the main study.

3.8.1 Reliability of the Research Instruments

Reliability refers to a measurement that supplies consistent results over different situations. It measures a research instrument's consistency, precision, repeatability, and trustworthiness. It indicates the extent to which it is without bias (error-free) and hence ensures consistent measurement across time and the various items in the

instruments. Reliability is important in research because it tests if the study fulfills its intended aims and hypothesis and ensures that the results are due to the study and not interfered with by extraneous variables. A high reliability means that a measure can give similar results under similar conditions (Kothari, 2018). Cronbach's alpha coefficient was used to test the reliability of the data. Cronbach's alpha, whose range is between 0 and 1, measures internal consistency and the extent of the relationship between the set of items in a group. It also quantifies scale reliability (Allen, Robson, & Iliescu, 2023). If the alpha coefficient is high, then the items under study are highly reliable. An acceptable value of Cronbach's alpha is 0.7 or more; a value lower than 0.7 is questionable (Singpurwalla, 2019).

3.8.2 Validity of the Research Instruments

The validity of a research tool is the extent to which it measures what it is supposed to quantify. In other words, validity is the degree to which results obtained from data analysis represent the phenomenon under study (Jilcha, 2020). The basic approaches to the validity of tests and measures are content validity, face validity, and construct validity.

Face validity, or logical validity, is the extent to which a test is subjectively viewed as covering the concept it purports to measure (Allen, Robson, & Iliescu, 2023). This type of validity concerns whether a measure seems relevant and appropriate for what it only assesses on the surface. Face validity involves the expert looking at the items in the questionnaire and agreeing that the test is a valid measure of the concept being measured just on the face of it. This means that they are evaluating whether each measuring item matches any given conceptual domain of the concept. Because there is no statistical test to determine whether a measure adequately covers a content area or adequately represents a construct, face validity usually depends on the judgment of experts in the field (Connell et al., 2018). Asenahabi (2019) asserted that face validity is determined by expert judgment. This study used the experts in the field of study, that is, lecturers and supervisors, to determine the face validity of the study.

Construct validity is a judgment based on the accumulation of evidence from numerous studies using a specific measuring instrument. Evaluation of construct

validity requires examining the relationship of the measure being evaluated with variables known to be related or theoretically related to the construct measured by the instrument. Construct validity was ensured through the operationalization of terms to guarantee that the study variables reflect the theoretical assumptions that underpin the conceptual framework for the study.

Content validity is used in research and measurement to assess whether a particular instrument adequately represents the content domain or universe of items related to the construct or concept it intends to measure (Bryman & Cramer, 2018). In other words, content validity evaluates whether the items or questions in the instrument effectively cover the entire range of the measured construct (Creswell, 2019). To test this validity, the study computed factor analysis that helped extract those items with an Eigenvalue greater than 1. Any item that had less than 1 Eigenvalue was excluded. The researcher used the Kaiser Normalization Criterion, which allows for extracting components with an Eigenvalue greater than 1. The principal component analysis was used, and eight factors were extracted

3.9 Data Analysis and Presentation

Quantitative and qualitative data were generated from closed-ended and open-ended questions. Qualitative data was analyzed on a thematic basis, and the findings were provided in a narrative form. Before the data could be analyzed, the researcher ensured the data was checked for completeness, followed by data editing, data coding, data entry, and data cleaning. Inferential and descriptive statistics were employed for the analysis of quantitative data with the assistance of Statistical Package for Social Sciences (SPSS Version 28). To summarize the respondent's responses about their views on the various aspects of the variables, the respondents' demographic information analysis was undertaken using descriptive statistics (Jilcha, 2020).

Descriptive statistics such as frequency distribution, mean (measure of dispersion), standard deviation, and percentages were used. Descriptive statistics, therefore, enable researchers to present the data more meaningfully, allowing for simpler and easier interpretation (Singpurwalla, 2019). Inferential data analysis was conducted

using multiple regression analysis, Pearson correlation coefficient, and multiple regression analysis. The inferential statistic is used to judge the probability that an observation is dependable or happened by chance in the study. Before conducting inferential statistics, the researcher conducted diagnostic tests.

3.9.1 Descriptive Statistics

Descriptive statistics, including frequencies, percentages, mean, and standard deviations, were used in data analysis. They were utilized to summarize, reduce data, and analyze constructs and items. This form of analysis gave insights into the sample attributes. Descriptive statistics were offered as a basis for inferential statistics using multiple regressions and correlation.

3.9.2 Statistical Modelling

Based on this background, the following linear regression model was used to test the linear relationships between individual value chain management practices and the dependent variable performance of food and beverage manufacturing companies. A Simple linear regression model was used to test the hypotheses as follows:

Regression model for hypotheses 1-4;

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon \ldots\ldots (i)$$

$$Y = \beta_0 + \beta_2 X_2 + \varepsilon \ldots\ldots (ii)$$

$$Y = \beta_0 + \beta_3 X_3 + \varepsilon \ldots\ldots (iii)$$

$$Y = \beta_0 + \beta_4 X_4 + \varepsilon \ldots\ldots (iv)$$

Whereby Y is the dependent variable Performance of food and beverage manufacturing firms in Kenya.B_0=Constant B_1-B_4=Coefficients of determination, X_4= Inbound logistics, and ε = Error term

The study also relied on a combined simple linear model and a multiple linear regression model to test the significance of the influence of the combined

independent variables on the dependent variable. The multiple linear regression model that was used in this study is presented below:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(vi)}$$

The regression model after moderation was as follows:

To establish the moderating effect of technology integration in the study relationship, the following three regression models as follows;

Where Y is the dependent variable on the performance of Kenya's food and beverage manufacturing firms.

Z= The Hypothesised Moderator (Technological Integration)

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 Z + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(vii)}$$

B_5 is the coefficient of Z, the interaction term.

3.9.3 Factor Analysis

Factor analysis acts as a gauge of the substantive importance of a given variable to its factor, and it is used to identify and remove hidden constructs or variable items that do not meet the study's objectives and may not be apparent from direct analysis (Ragin, 2014). The Kaiser-Meyer-Olkin (KMO) and Bartlett’s tests were analyzed adequately to sample the data collected for the entire study. The study used Principal Component Analysis to extract factor analysis results. Communalities were used to indicate the substantive importance of variable factors where a loading value of 0.7, as a rule of thumb, is believed to be satisfactory (Timothy, 2015).

3.10 Diagnostic Tests

When the assumptions of the linear regression model are correct, ordinary least square (OLS) provides efficient and unbiased estimates of the parameters (Long & Ervin, 2018). Independent variables were subjected to the following tests: normality, linearity, multicollinearity, homoscedasticity, and heteroskedasticity before

regression analysis was conducted. In case of violation of the regression assumptions, the confidence intervals, significance levels, and coefficient estimates derived from the regression model may be regarded as misleading, biased, or inefficient. Moreover, when one or more regression assumptions are violated, the inferences derived from the regression model cannot be generalized on other data.

3.10.1 Normality Test

To test for normality assumptions, the study adopted an improved Shapiro-Wilk test. The Shapiro-Wilk test is a test for normality in regression studies, which is generally preferred because of its superb power properties (Asenahabi, 2019). The test yields a value (W) between zero and one. One value indicates normality, whereas weak values indicate a departure from normality (Bryman & Cramer, 2018). This study has, in principle, stuck to this stated convention of interpreting normality.

3.10.2 Linearity Test

One of the assumptions in regression analysis is that the predictor-independent variables and response-dependent variable relationships are linear. A linear relationship tends to exist when the values of the independent variable (X) and the values of the dependent variable (Y) are apparently in a straight line when plotted on a graph. The line could be either a negative or positive slope (Grant, 2017). The linearity of variables can be examined with a scatter diagram or correlation analysis. This study used Pearson's Product Moment Correlation Coefficient (r) to check for linearity between the independent variables. This helped the researcher know whether the OLS condition was met.

3.10.3 Multicollinearity Test

Multicollinearity was addressed using the variance inflation factor (VIF) to measure the variance of the estimators. This is expressed as $VIF = 1/(1-R^2)$. The general rule is that values greater than ten suggest the presence of multicollinearity (Noora. 2020). If multicollinearity is detected, collecting more data or dropping off some correlated variables is the remedy. The key limitation of multicollinearity is that it

can yield unstable regression coefficients characterized by significant standard errors and high variances, leading to inaccurate statistical inferences (Allen, Robson, & Iliescu, 2023).

3.10.4 Homoscedasticity and Heteroskedasticity Test

Heteroscedasticity in a study usually happens when the variance of the errors varies across observations (Creswell, 2019). Breusch-Pagan and Koenker's test was used to test the null hypothesis that the error variances are all equal versus the alternative that the error variances are a multiplicative function of one or more variables. Breusch-Pagan and Koenker test the null hypothesis that heteroskedasticity is absent (homoskedasticity) if the sig-value is less than 0.05, rejecting the null hypothesis. An immense chi-square value greater than 9.22 would indicate the presence of heteroscedasticity (Jochmans, 2020).

3.11 Operationalization of the Research Variables

The dependent variable in this study was the performance of food and beverage manufacturing firms in Kenya, while value chain management practices formed the independent variables. Table 3.3 describes the study variables and how they were operationalized.

Table 3.3: Operationalization Table

Research Objectives	Variable	Variable Measurable Indicators	Hypothesis testing F-statistics	Analytical model	Data Analysis Techniques
To determine the relationship between material management and the performance of food and beverage manufacturing firms in Kenya	Material Management	• Value Chain Capacity • Strategic Sourcing • Material Requirement planning	F-Cal F-Cri	$Y = \beta_0 + \beta_1 X_1 + \varepsilon$	Descriptive statistics. Correlation, regression, and Content Analysis
To establish how outbound logistics relates to the performance of food and beverage manufacturing firms in Kenya.	Outbound Logistics	• Order processing • Dispatch • Packaging	F-Cal F-Cri	$Y = \beta_0 + \beta_2 X_{2+} \varepsilon$	Descriptive statistics. Correlation, regression, and Content Analysis
To evaluate the relationships between operations management on the performance of food and beverage manufacturing firms in Kenya	Operations Management	• Process Optimization • Production Scheduling • Capacity planning	F-Cal F-Cri	$Y = \beta_0 + \beta_3 X_3 + \varepsilon$	Descriptive statistics. Correlation, regression, and Content Analysis
To establish the relationship between inbound logistics and the performance of food and beverage manufacturing firms in Kenya	Inbound Logistics	• Receiving • Storage • Inventory control	F-Cal F-Cri	$Y = \beta_0 + \beta_4 X_4 + \varepsilon$	Descriptive statistics. Correlation, regression, and Content Analysis
To assess the moderating effect of Technological Integration and the relationship between value chain practices and the performance of food and beverage manufacturing firms in Kenya	Technological Integration	• Infrastructure • Automation of operations • Technical Capacity	F-Cal F-Cri	$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 Z_5 + \varepsilon$	Descriptive statistics. Correlation, regression and Content analysis

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This chapter focuses on analyzing data, presenting findings, interpreting results, and discussing the objective of the study, which aimed to establish the relationship between value chain management practices and the performance of food and beverage manufacturing firms in Kenya. The chapter begins with an overview of the questionnaire's response rate, followed by the respondents' pilot test results and background information. Descriptive results are then provided for the dependent, independent, and moderating variables. The subsequent section details inferential statistics, including diagnostic tests, correlation analysis, Simple linear regression analysis, Multiple regression analysis, and moderating effect analysis. The chapter uses tables, graphs, and figures to present the results effectively.

4.2 Response Rate

The sample size for the study was 152 key informants working in selected food and beverage manufacturing firms in Kenya. The sample chosen was issued with questionnaires. The returned questionnaires were crosschecked for accuracy and completeness, and 130 were found to be valid and reliable and were used for further analysis and reporting. The returned questionnaires formed a response rate of 85.6%, as shown in Table 4.1. As Noora (2020) explained, a response rate of 50% and above is adequate for analysis; 60% and above is good, while of 70% and above is excellent. Therefore, the response rate of 85.6% was excellent and was used for further analysis and reporting.

Table 4.1: Response Rate

Questionnaire	Frequency	Percent
Returned	130	85.6
Non returned	22	14.4
Total	152	100.0

4.3 Pilot Study Results

The researcher conducted a pilot study to ensure the data collection tool was reliable and valid. The pretesting sample comprised 15 respondents, representing 10% of the sample size. The results from the pilot test were not used in the main study, and the respondents used in the pilot test were excluded from the final study.

4.3.1 Reliability Test Results

Reliability refers to a measurement that supplies consistent results over different situations. Cronbach's alpha coefficient was used to test the reliability of the data. Cronbach's alpha, whose range is between 0 and 1, measures internal consistency and the extent of the relationship between the set of items in a group. It also quantifies scale reliability (Kothari, 2018). If the alpha coefficient is high, then the items under study are highly reliable. An acceptable value of Cronbach's alpha is 0.7 or more; a value lower than 0.7 is questionable (Singpurwalla, 2019). The reliability test results are shown in Table 4.2. From the findings, all the variables had Cronbach alpha values greater than 0.7, indicating that all the measures included in the model were reliable. The study questionnaire met the reliability criteria ($\alpha>0.7$).

Table 4.2: Reliability Test Results

Variable	Cronbach's Alpha	Number of Items	Interpretation
Material Management	0.822	9	Reliable
Outbound Logistics	0.822	8	Reliable
Operations Management	0.823	9	Reliable
Inbound Logistics	0.810	9	Reliable
Technological integration	0.786	9	Reliable
Performance of Food and Beverage Manufacturing firms	0.831	9	Reliable

4.4 Factor Analysis

To determine Validity of the research instrument factor analysis was carried out .Content validity was used in research and measurement to assess whether a particular instrument adequately represents the content domain or universe of items related to the construct or concept it is intended to measure. In other words, content validity evaluates whether the items or questions in the instrument effectively cover the entire range of the measured construct (Nouri et al., 2022). To test this validity, the study computed factor analysis that helped extract those items with an Eigenvalue greater than 1 shown in Appendix IV. Any item that had less than 1 Eigenvalue was excluded .

4.4.1 Validity Test Results

The study supervisors approved the questionnaire after ascertaining that all the items in the study variable were adequately covered to measure the link between value chain management and the performance of food and beverage manufacturing firms. Further, factor analysis was done to ascertain the instrument's content validity. The results from the computed factor analysis indicated that all the items for each of the study variables had an Eigenvalue greater than 1. This demonstrated that questions or items in the questionnaire adequately covered the value chain management practices, as was expected. Construct validity was addressed by operationalizing value chain management practices as conceptualized by the study as aligned with the theoretical assumptions of the conceptual framework.

4.5 Demographic Information Analysis

This section provides general information about the respondents. It sought to determine their demographic characteristics, length of time in operation, and ownership. The findings are presented and discussed in the sub-sections below.

The study sought to establish the period when the food and beverage manufacturing firms were operating. From the findings in Table 4.3, the majority of the firms (53.8%) had been in operation for 16-30 years, 37.7% of the firms had been in

operation for more than 30 years, and 8.5% of the firms had been in operation for at least 15 years. This implies that most manufacturing firms have operated for 16-30 years. This empirical evidence underscores that many manufacturing firms have thrived over extended periods, reinforcing the study's finding that the majority have been in operation for 16-30 years.

Table 4.3: Length of Operations

Length of Operations	Frequency	Percentage
0-15 years	11	8.5
16-30 years	70	53.8
Above 30 years	49	37.7
Total	130	100.0

4.5.1 Ownership

The study sought the ownership of Kenya's food and beverage manufacturing firms. The results are presented in Table 4.4. From the results, 63.7% of the food and beverage manufacturing firms were locally owned, 20% were regionally owned, and 16.3% were foreign-owned.

Table 4.4: Ownership of the Company

Length of Operations	Frequency	Percentage
Locally Owned	82	63.7
Foreign Owned	21	16.3
Regionally Owned	27	20.0
Total	130	100.0

4.6 Descriptive Analysis of the Study

In this subsection, the study presents findings on Likert scale questions where respondents were asked to indicate their level of agreement with various statements that relate to the relationship between value chain management practices and the performance of food and beverage manufacturing firms in Kenya. They used a 5-point Likert scale where 1-strongly disagree, 2-disagree, 3-moderate, 4-agree, and 5-strongly agree. The mean and standard deviations were used to interpret the findings with a mean value of 1-1.4 strongly disagree, 1.5-2.4 disagree, 2.5-3.4 neutral, 3.5-

4.4 agree, and 4.5-5 strongly agree, supported by Kothari (2018). In contrast, in this study, the findings were neutral, agreed, and strongly agreed as per the results discussed and shown in the tables. Standard deviations greater than 1 implied significant deviation in data points from the mean. This study section also presented findings from open-ended questions in prose form.

4.6.1 Material Management

The study sought to determine the relationship between material management and the performance of food and beverage manufacturing firms in Kenya. Descriptive analytics was undertaken to provide the current status and identify trends and relationships between value chain management practices and the Performance of Food and Beverage manufacturing firms in Kenya. The study employed descriptive frequencies that included responses in percentages and descriptive analysis that included mean and standard deviations to understand the trends and relationship between material management and the performance of food and beverage manufacturing firms in Kenya. The study operationalized material management indicators through value chain capabilities, strategic sourcing, and material requirement planning

On value chain capabilities, the results in Table 4.5 show that the majority 79.3% of the respondents strongly agreed, as indicated by a mean of 4.7231 with a standard deviation of 0.58423, that their companies had well-defined supply chain strategies aligned with overall business goals, 13.8, % agreed while 6.9% were neutral. This implied that food and beverage manufacturing firms had instituted good supply chain strategies aligned with company performance goals. In the findings on item two in Table 4.5, the majority (68.5%) of the respondents strongly agreed, and 6.9% were neutral. In comparison, 24.6% agreed, as indicated by a mean of 4.6154 and standard deviation of 0.615, that food and beverage manufacturing firms regularly assess and update respective supplier selection criteria to ensure quality and reliability. This indicated that evaluation and fostering of supplier selection criteria are achieved to attain such chain performance and overall achieve performance goals. In the finding on item three in Table 4.5, the majority, 63.8%, strongly agreed (M=4.6077,

SD=0.550) that food and beverage manufacturing firms maintain clear communication channels with key suppliers for efficient information flow, 33.1% agreed, while 3.1% were neutral. This demonstrated that the majority of the food and beverage manufacturing firms prioritize communication channels to enhance suppliers' capability through efficient and effective information sharing with suppliers and achieve expected performance levels. The results demonstrated that material management through effective supplier collaboration and material storage capabilities fosters organizational performance.

On strategic sourcing, the results item four in Table 4.5, majority, 68.4% strongly agreed (M=4.677 and SD=.48569) that food and beverage manufacturing firms have formal strategic sourcing processes in place to identify and select suppliers, 30.8% agreed with 0.8% of the respondent remaining neutral This clearly indicated that food and beverage manufacturing firms had instituted strategic sources processes to help in choosing the best suppliers to guarantee quality and reliable supplies for continuous production and achieving performance. As a result, in Table 4.5, the majority (83.1%) of the respondents strongly agreed (M=4.7462 and SD=0.63869) that supplier performance evaluations are conducted regularly to ensure compliance with established standards in food and beverage companies, 10.8% agreed. In comparison, 6.1% As were as neutral As. To achieve performance goals, food and beverage companies conduct suppliers' performance evaluations to achieve reliable and quality supplies. Also, found in Table 4.5, the majority (61.5%) of the respondents strongly agree (M=4.6154 and SD=0.48839) that food and beverage manufacturing firms actively develop long-term relationships with key suppliers to enhance collaboration and value creation and achieve performance, while 38.5% agreed. This demonstrated an effort to achieve the expected market share, profitability, and sales performance. The results were supported by Asaolu, Agorzie, and Unam (2019). Materials management through fostering good vendor relationships and better pricing of products in the F&B Manufacturing Industry to achieve significant cost savings, production efficiency improvement, and profitability and competitiveness.

In regards to material requirement planning, the findings in Table 4.5, the majority (86.2%) of the respondents strongly agreed (M=4.8385 and SD=0.42779) that the material requirement planning system does foster material availability for production and products are available for delivery to customers, 11.5% of the respondents agreed. In comparison, 2.3% of the respondents were neutral. The findings implied that food and beverage manufacturing firms deploy material requirement planning systems to enhance the availability of materials for efficient production and achieve performance.

Also, most of the respondents 53.8% agreed; in contrast, 46.2% strongly agreed (M=4.4615 and SD=0.50045) that their food and beverage manufacturing firms achieve increasing efficiency in the whole operating range through improvements in material flow and, so, shortened lead times and reduced stocks. This implied that to achieve performance, the food and beverage companies are increasing efficiency in the whole operating range achieved through improvements in material flow

Finally, the results of item nine in Table 4.5 indicated that the majority (73.0%) of the respondents strongly agreed (M=4.6462 and SD=0.63321) that food and beverage manufacturing firms simulate complex material flows for modeling and verification purposes, 18.5% agreed, while 8.5% were neutral. Overall, the study revealed that most respondents strongly agreed, supported by an aggregate mean of 4.65898 with a standard deviation of 0.547011, that material management is well-defined in the supply chain strategy aligned with overall business goals. The result concurred with Essel's (2021) assessment of the relationship between materials management practices and firm performance in Ghana using dominance Analysis and revealed that materials requirement planning and control contributed significantly to the firm’s performance, while ergonomics was the least significant predictor. Also, Chompunuch et al. (2022) revealed that value chain management and business performance were consistent with empirical data. Material requirement planning and support activities in the value chain positively affected business performance. The study opined that those activities, inbound logistics, operations, outbound logistics, marketing and sales, and services contribute to firm performance.

Table 4.5: Table of Material Management

Statements	N	A	SA	Mean	Std. Dev.
Our organization has a well-defined supply chain strategy aligned with overall business goals	6.9%	13.8%	79.3%	4.7231	.58423
We regularly assess and update our supplier selection criteria to ensure quality and reliability	6.9%	24.6%	68.5%	4.6154	.615
Our organization maintains clear communication channels with key suppliers for efficient information flow.	3.1%	33.1%	63.8%	4.6077	.550
Our organization has a formal strategic sourcing process	0.8%	30.8%	68.4%	4.677	.48569
Supplier performance evaluations are conducted regularly	6.1%	10.8%	83.1%	4.7462	.63869
We actively seek to develop long-term relationships with key suppliers to enhance collaboration and value creation	0%	38.5%	61.5%	4.6154	.48839
Material requirement planning system is linked to production and products are available for delivery to customers	2.3%	11.5%	86.2%	4.8385	.42779
The increasing efficiency in the whole operating range	0%	53.8%	46.2%	4.4615	.50045
Organizations simulate complex material flows for modelling and verification purposes	8.5%	18.5%	73.0%	4.6462	.63321
Aggregate Score				**4.65898**	**0.547011**

4.6.2 Outbound Logistics

The study sought to determine the relationship between outbound logistics and the performance of food and beverage manufacturing firms in Kenya. Descriptive statistics frequencies, mean, and standard deviation were deployed to establish the trend and relationship between outbound logistics and the performance of food and beverage manufacturing firms. Order processing, dispatching, and packaging were indicators adopted for outbound logistics. The study sought to establish the relationship between outbound logistics and performance in Kenya's food and beverage manufacturing firms.

The study focused on order processing. From the results item one in Table 4.6, respondents (49.2%) agreed (M=4.2692 and SD=0.90467) that food and beverage firms have order processing systems to capture order data from customer service employees or customers directly, 36.9% strongly agreed, while 13.9% were neutral. This implied that for food and beverage companies to achieve performance, they deployed an order processing system to capture customer data directly from customer service employees or customers. The results were in line with Goulap et al. (2023) that effective materials management dimensions, such as effective order processing and interdepartmental collaboration among materials-related departments, such as inventory, procurement, and storage management, contributed to the profitability of the companies.

The result Item Two in Table 4.6, most (55.4%) of the respondents agreed (M=4.2769 and SD=0.61019) that food and beverage companies use an order processing system to store the data in a central database and send order information to the accounting departments, 36.1% of the respondents strongly agreed. In comparison, 8.5% of the respondents were neutral. This implies that food and beverage companies utilize order processing systems to store data in a central database and share order information with accounting departments to achieve performance. The findings concurred with those of Gadwe and Sangode (2019), who explored logistics management and marketing performance of small and medium-sized manufacturing firms and revealed that order processing management, transportation management, inventory management, and warehouse management had significant positive influences on the marketing performance of small and medium-sized manufacturing firms

The results of item three in Table 4.6 show that the majority (56.2%) of the respondents strongly agreed (M=4.5154 and SD=0.62549) that food and beverage manufacturing firms have carriers that fulfill the process of handling the goods to the customers' specified locations to achieve performance, 43.8% agreed. This demonstrated that food and beverage manufacturing firms have carriers that fulfill the process of handling the goods to the customers' specified locations to achieve performance

On dispatching activities, the results in Table 4.6 show the majority (66.9%) of the respondents strongly agreed (M=4.6692, SD=0.47231) that food and beverage deployed dispatch system in an effort to achieve timely delivery of goods/services, and 33.1% of the respondents agreed. This implied that food and beverage companies utilize dispatch systems to achieve timely delivery of goods/services to achieve performance goals. From the study in Table 4.6, most (51.5%) of the respondents agreed (M=4.4231 and SD=0.55497) that food and beverage companies achieve dispatching of items and reach their destination within the expected timeframe, 45.4% of the respondents strongly agreed, while 3.1% were neutral. This implied that dispatching items to reach their destination within the expected timeframe would contribute to the performance of food and beverage firms in Kenya. The findings were supported by Hsu (2022), who stated that dispatching practices significantly positively influence profitability and market performance in the context of small and medium-sized manufacturing firms.

The results on item seven in Table 4.6 indicated that most (50.8%) of the respondents agreed (M=4.4923 and SD=0.50187) that dispatch processing in Food and beverage firms is streamlined and minimizes delays, while 49.2 % strongly agreed. This implies that dispatch processing in food and beverage firms is streamlined and minimizes delays in achieving performance goals.

The results on item eight in Table 4.6 indicate that the majority (50.0%) strongly agreed (4.5000 and SD=0.50193) that outbound logistics systems deployed in food and beverage companies offer advanced visibility and a broader overview of shipment distribution, while 50.0% agreed. This demonstrated that the utilization of outbound logistics systems adopted by food and beverage companies contributed to achieving vast visibility and a broader view of shipment distribution, improving the profitability of companies, increasing the customer base, and fostering sales performance. Further, on item nine, the majority (63.8%) strongly agreed (M=4.56000, SD=0.72870) that food and beverage companies use logistics data to support the marketing team in planning digital marketing and advertising campaigns. 22.4% agreed, while 13.8% were neutral. The study revealed that most respondents strongly agreed, supported by an aggregate mean of (4.455773, SD 0.612516). This

clearly indicated that utilizing logistics information to support the marketing team in planning digital marketing and advertising campaigns contributes to achieving performance goals.

Other studies, such as Goulap, Elifneh, Yohannes, and Belew (2022), similarly revealed that outbound logistics, such as order processing management, transportation management, inventory control, and packaging management, significantly influenced the marketing performance of food and beverage manufacturing firms.

Table 4.6: Table of Outbound Logistics

Statements	**N**	**A**	**SA**	**Mean**	**Std. Dev.**
There is an order processing system to capture suppliers' data	13.9%	49.2%	36.9%	4.2692	.90467
Order processing system is used to store the data in a central database	8.5%	55.4%	36.1%	4.2769	.61019
There is order fulfilling process of handling the goods to the customers' specified locations	0.0%	43.8%	56.2%	4.5154	.62549
Our dispatch system ensures the timely delivery of goods/services.	0.0%	33.1%	66.9%	4.6692	.47231
Dispatched items reach their destination within the expected timeframe.	3.1%	51.5%	45.4%	4.4231	.55497
The dispatch process is streamlined and minimizes delays.	0.0%	50.8%	49.2%	4.4923	.50187
There is advanced visibility and a broader overview of shipment distribution	0.0%	50.0%	50.0%	4.5000	.50193
Our company uses logistics data to support the marketing team in planning digital marketing and advertising campaigns	13.8%	22.4%	63.8%	4.56000	.72870
Aggregate Score				**4.455763**	**0.612516**

4.6.3 Operations Management

The study sought to determine the relationship between operations management and the performance of food and beverage manufacturing firms in Kenya. The results in Table 4.7, item one majority (70.8%) strongly agreed, 29.2% agreed as supported by a mean of 4.7077 and standard deviation of 0.45658 that the efficiency of production processes minimize waste and maximize resource utilization to achieve expected performance in food and beverage firms in Kenya.

The finding in Table 4.7, item two is that the majority (56.9%) of the respondents strongly agreed (4.5692 and SD=0.49710) that food and beverage companies effectively manage inventory levels to achieve a continuous supply of raw materials for production. In contrast, 43.1% of the respondents agreed. This implied that efficient and effective management of inventory control contributed to achieving a continuous supply of raw materials that could improve the companies' performance. The finding in Table 4.7, item three, shows that the majority (70.0%) of the respondents strongly agreed that food and beverage firms have adequate quality control measures to achieve compliance with production standards and customer expectations. In comparison, 30% of the respondents agreed, supported by a mean of 4.7000 and a standard deviation of 0.46003. This demonstrated that through efficient and effective quality controls, the companies comply with production standards and offer quality products that meet customers' expectations, hence, large volumes of sales. The finding was supported by Sandar (2024), who revealed that process optimization has a positive and significant link to firm profitability.

From the results in Table 4.7 item four, the majority of the respondents (60.0%) strongly agreed, as supported by a mean of 4.5231 and standard deviation of 0.63753, that food and beverage companies' integrated technology and automation into companies' operations to improve efficiency and productivity, 32.3% agreed while 7.7% remain neutral. This demonstrated that effective operations management through the integration of technology resulted in the improvement of operation efficiencies and an increase in productivity. In Table 4.7, item five, the majority (63.8%) of the respondents strongly agreed (M=4.6385 and SD=0.48230) that food and beverage manufacturing firms' collaboration with suppliers yielded reliable and

cost-effective supply chains for raw materials and ingredients for continuous production. In comparison, 36.2% of the respondents agreed. The results demonstrated that successful collaboration with suppliers influences the achievement of reliability and cost-effectiveness in supplies that could contribute to better financial returns and improve customer base and market share. The finding was similar to that of Plamen and Pavel (2023), who revealed an optimization model for production scheduling, considering preventive maintenance in an uncertainty-based production system. The study revealed that optimizing the execution times of all orders, and specifically the production lines usage - their optimal load and non-use of unnecessary machines contributed to cost savings and improved efficiency of the production process and led to improving the financial performance of the companies

From the results in Table 4.7 item six, the majority (61.5%) of the respondents strongly agreed (M=4.6154 and SD=0.48839), while 38.5% agreed that there is monitoring and optimizing of performance of production lines contributing to the achievement of maximum output and minimizing downtime in food and beverage manufacturing firms. From the results in Table 4.25 item seven, the majority (65.4%) of the respondents strongly agreed (M=4.6538 and SD=0.47758), while 34.6% agreed that Food and beverage have formal capacity planning processes to achieve adequate production capabilities to achieve the expected performance level. From the results in Table 4.7, item eight, the majority (66.2%) of the respondents strongly agreed (M=4.6615 and SD=0.47502). In comparison, 33.8% agreed that food and beverage companies instituted short-term and long-term demand forecasts to determine production capacity to achieve the expected performance level. The results were similar to those of Walker and Strickler (2020). Operations management practices such as equipment layout, planning capacity, and supplier quality management positively and significantly contribute to financial performance—further studies such as Plamen, Pavel, and Ivan. (2023) opined that equipment layout, JIT delivery by supplier, Kanban, cleanliness and organization, and information and feedback are positively and significantly related to improvement in sales volumes and market share of companies.

On capacity planning, results in Table 4.7, the majority (69.2%) of the respondents strongly agreed (M=4.6923 and SD=0.46332), while 30.8% agreed that cross-functional collaboration was deployed as an enabler to foster capacity planning processes in production, sales, and supply chain teams to achieve performance. On average, respondents strongly agreed, as supported by a mean of 4.640167 and a standard deviation of 0.493094, which implies that operations management influences performance in food and beverage manufacturing firms. The results were supported by Bosire (2018), who indicated that there is a positive correlation between customer-driven strategies, product development strategies, personnel development strategies, competitive advantage strategies, and organizational performance. The study concluded that organizations used various customer strategies that attract more new customers, hence achieving a wider range of markets that improve performance and loyalty to the organization, increased product flexibility, and superior customer value delivery positively impacts organizational performance.

Table 4.7: Table of Operations Management

Statements	N	A	SA	Mean	Std. Dev.
There is minimal waste and maximum resource utilization.	0%	29.2%	70.8%	4.7077	.45658
We effectively manage inventory levels to ensure a continuous supply of raw materials for production.	0%	43.1%	56.9%	4.5692	.49710
Our quality control measures effectively ensure that our food products meet regulatory standards and customer expectations.	0%	30.0%	70.0%	4.7000	.46003
We integrate technology and automation into our operations to improve efficiency and productivity.	7.7%	32.3%	60.0%	4.5231	.63753
Our collaboration with suppliers ensures a reliable and cost-effective raw materials and ingredients supply chain.	0%	36.2%	63.8%	4.6385	.48230
We monitor and optimize the performance of our production lines to achieve maximum output and minimize downtime.	0%	38.5%	61.5%	4.6154	.48839
Our organization has a formal capacity planning process to ensure adequate production capabilities	0%	34.6%	65.4%	4.6538	.47758
We consider both short-term and long-term demand forecasts when determining production capacity	0%	33.8%	66.2%	4.6615	.47502
Cross-functional collaboration is key in our capacity planning process, involving production, sales, and supply chain teams	0%	30.8%	69.2%	4.6923	.46332
Aggregate Score				**4.640167**	**0.493094**

4.6.4 Inbound Logistics

The study sought to establish the relationship between inbound logistics and the performance of food and beverage manufacturing firms in Kenya. Effective inbound logistics is a significant predictor of performance in manufacturing firms. The result in Table 4.8 item one shows that most (55.4%) respondents strongly agreed (M=4.5538, SD=0.49902). In comparison, 44.6% agreed that food and beverage companies have well-defined processes for receiving raw materials and ingredients

from suppliers. This implied that companies would perform better through effective and efficient goods receiving and storage processes. The result in Table 4.8 item two is that the majority (70.8%) of the respondents strongly agreed (M=4.6000, SD=0.67743), and 18.4% agreed. In comparison, 10.8% were neutral, and they believed that food and beverage firms prioritize efficient unloading, inspection, and documentation of incoming shipments. Tembo and Mutono-Mwanza (2024 assessed the influence of market information, packaging, transportation, storage, processing linkage, quality, and regulations of food waste along the vegetable supply chain at Soweto Market. The study revealed that inbound logistics feted by transportation, storage, processing linkage, quality, and regulations contribute to food and beverage supply sustainability. It was also found that packaging contributed highly to reliability and internal consistency in the supply of products to the market. It revealed that processing linkage has a significant positive influence on adequate storage and control of supplies, hence improving firm performance. These findings contribute to reducing food waste along the vegetable supply chain, ultimately improving food sustainability.

The result in Table 4.8 item three, most (53.8%) of the respondents agreed (M=4.4615, SD=0.50045), 46.2% strongly agreed that involvement of cross-functional teams in receiving processes in food and beverage companies contributed to accuracy and quality products in the market. The result in Table 4.8 item four is that the majority (70.0%) of the respondents strongly agreed (M=4.7000, SD=0.46003), 30% agreed that proper storage conditions for raw materials and ingredients are maintained to foster product integrity and contribute to quality performance in food and beverage manufacturing companies. This demonstrated that promoting favorable storage conditions for products enhances product integrity and fosters the achievement of quality performance in product processing and manufacturing processes.

The result in Table 4.8, item five, (55.4%) of the respondents strongly agreed (M=4.4692, SD=0.64925), and 36.1% agreed. In comparison, 8.5% were neutral on implementing first-in-first-out (FIFO) or first-expiry-first-out (FEFO) inventory control systems adopted in food and beverage firms in Kenya. This implies that

FEFO and FIFO adoption foster the effectiveness of inbound logistics and achieve expected performance indicators, such as profitability, market share, and sales performance.

The result in Table 4. 8 items six: The majority (74.6%) of the respondents strongly agreed (M=4.7154, SD=0.51692), and 22.3% strongly agreed. In contrast, 3.1% of the respondents were neutral on whether food and beverage manufacturing firms actively monitor incoming materials' shelf life and expiration dates to prevent stockouts and waste. They demonstrate that food and beverage manufacturing firms actively promote monitoring of shelf life and expiration dates of incoming materials to prevent stockouts and waste and foster performance.

The result in Table 4. 8 item seven: The majority (60%) of the respondents agreed (M=4.4000, SD=0.49179), 40% strongly agreed, that Food and beverages maintain accurate and up-to-date inventory records using technology systems. This implies that maintaining accurate and up-to-date inventory records using technology systems fosters inbound logistics in Kenya's Food and beverage manufacturing firms.

The result in Table 4. 8 item eight: Most (55.4%) of the respondents agreed (M=4.4462, SD=0.49902), and 44.6% strongly agreed that conducting physical inventory assessments regularly enhances inventory management in the firms. This implies that conducting physical inventory counts regularly contributes to the company's performance.

The result is in Table 4.8, item nine, the majority (72.3%) of the respondents strongly agreed (M=4.7000, SD=0.50807), and 25.4% agreed. In contrast, 2.3% of the respondents were neutral on whether food and beverage manufacturing firms have experienced a reduction in stock-outs, resulting in improved on-time production and efficient inventory control. This implied that a reduction in stockouts improved on-time production and efficient inventory control, yielding performance in food and beverage manufacturing firms.

Overall, the study revealed that most respondents strongly agreed, supported by an aggregate mean of 4.5606 with a standard deviation of 0.53355, that inbound

logistics is executed to achieve performance goals in food and beverage manufacturing firms. The finding concurred with that of Sandar (2024) that inbound logistics capability contributed to firm performance in manufacturing companies in Thailand and that inbound logistics, receiving of goods, storage capacity, and inventory control contribute significantly to return on asset, reduction in cost of operations, and improved productivity.

Table 4.8: Table of Inbound Logistics

Statements	N	A	SA	Mean	Std. Dev.
Our organization has well-defined processes for receiving raw materials and ingredients from suppliers.	0%	44.6%	55.4%	4.5538	.49902
We prioritize efficient unloading, inspection, and documentation of incoming shipments.	10.8%	18.4%	70.8%	4.6000	.67743
Cross-functional teams are involved in the receiving process to ensure accuracy and quality.	0%	53.8%	46.2%	4.4615	.50045
There are proper storage conditions for raw materials and ingredients are maintained to ensure product integrity.	0%	30.0%	70.0%	4.7000	.46003
Our organization implements an inventory control system.	8.5%	36.1%	55.4%	4.4692	.64925
We actively prevent stockouts and waste	3.1%	22.3%	74.6%	4.7154	.51692
Our organization maintains accurate and up-to-date inventory records.	0%	60%	40%	4.4000	.49179
We regularly conduct physical inventory counts to reconcile system records with actual stock	0%	55.4%	44.6%	4.4462	.49902
We have experienced reduced stockouts and improved on-time production due to efficient inventory control.	2.3%	25.4%	72.3%	4.7000	.50807
Aggregate Score				4.5606	0.5335

4.6.5 Technological integration

Data on technological integration in food and beverage manufacturing firms' value chain management practices. Technological integration in value chain management practices would improve manufacturing firms' performance. The finding in Table 4.9 is that the majority (70.7%) of the respondents strongly agreed (M=4.7000 and

SD=0.47658), and 28.5% agreed. In comparison, 0.8% were neutral that food and beverage manufacturing firms invest in upgrading and maintaining technological infrastructure to support manufacturing operations.

The finding in Table 4.9 item two, the majority (57.7%) of the respondents strongly agreed, and 0.8% were neutral. In contrast, 41.5% agreed, as supported by a mean of M=4.5615 and SD=0.54280, that food and beverage manufacturing firms adopt innovative technologies to improve production efficiency and product quality. Also, the result in item three, Table 4.9, is that the majority (62.3%) of the respondents strongly agreed, and 9.2% were neutral. In contrast, 28.5% agreed, as evidenced by a mean of 4.5308 and a standard deviation of 0.66108, that food and beverage manufacturing firms updated and improved their technological systems to foster value chain management and achieve performance. The results were similar to Amy, Sithole, and Buchana's (2022) study of technological innovations on firm productivity using a sample of manufacturing.

Findings in Table 4.9 item four, most (53.8%) of the respondents strongly agreed, 14.6% were neutral, and 31.6% agreed as supported by a mean of 4.3923 with a standard deviation of 0.73132 that food and beverage manufacturing firms had adequate employees with technical skills. This implies that successful technological integration in companies would be achieved by improving staff's IT competencies. Item five results also established that most (49.2%) respondents strongly agreed, and 48.5% agreed (M=4.4692, SD=0.54543). In contrast, 2.3% of the respondents were neutral about regular employee training to equip them with technological skills. Also, in item six, table 4.9, the majority (64.6%) of respondents strongly agreed, and 35.4% agreed, as supported by a mean of 4.6462 (SD 4800), that companies achieved effectiveness in manufacturing processes due to technological capacity in food and beverage manufacturing firms. Also, most respondents strongly agreed that Automation is a key aspect of food and beverage manufacturing processes, helping us achieve higher levels of consistency and precision, as supported by a mean of 4.6308 with a standard deviation of 0.48446. In Table 4.9 item 7, most respondents strongly agreed, 63.1% agreed, and 36.9% agreed. The findings were in line with Monika et al.'s (2020) findings that demonstrated that technological change and IT

infrastructure positively and significantly impact the productivity of companies in Malaysia.

Further, Table 4.9 shows that on item eight, most (53.1%) of the respondents strongly agreed, and 40.8% agreed. In comparison, 6.1% were neutral and believed that food and beverage manufacturing firms embraced technology. Finally, in item 9 of the study, 40% strongly agreed that the utilization of technology could be monitored, while 60% agreed. The aggregate mean was 4.533 (SD 0.5583). This implies that technology integrations in value chain management could improve the firms' performance.

Table 4.9: Table of Technological Integration

Statements	**N**	**A**	**SA**	**Mean**	**Std. Dev.**
There is upgrading and maintaining technological infrastructure in operations.	0.8%	28.5%	70.7%	4.7000	.47658
We actively seek out innovative technologies in the value chain	0.8%	41.5%	57.7%	4.5615	.54280
technology and systems are improved to optimize operations	9.2%	28.5%	62.3%	4.5308	.66108
Our organization had adequate employees with technical skills	14.6%	31.6%	53.8%	4.3923	.73132
Regular training is done on employees to equip them with technical skills	2.3%	48.5%	49.2%	4.4692	.54543
I am satisfied with the effectiveness of technical capacity in our organization	0%	35.4%	64.6%	4.6462	.48003
Automation is a key aspect of our manufacturing processes, helping us achieve higher levels of consistency and precision.	0%	36.9%	63.1%	4.6308	.48446
We have embraced the use of technology in ensuring effective and efficient customer relations management	6.1%	40.8%	53.1%	4.4692	.61233
Our organization utilizes technology to monitor equipment performance and conduct predictive maintenance	0%	60%	40%	4.4000	.49172
Aggregate Score				4.533	0.5583

4.6.6 Performance of Food and Beverage Manufacturing Firms (Secondary)

The performance of food and beverage manufacturing firms was measured through market share, profitability, and sales volume. The statistics presented in this section cover a period of five years, from 2019 to 2023.

The study sought the average market share for the food and beverage manufacturing firms in Kenya for a period of 5 years, from 2019 to 2023. The firm's average market share was determined through a percentage of total revenue or sales in a market that a company's business makes up. The average market share trends revealed an upward trend and a downward trend. The firms exhibited an upward trend in market share in 2019. The market share was 11.5576%, increased to 14.3576%, and then exhibited a downward trend to 8.8584%. The market shares then increased to 12.0605% before declining to 10.8951% in 2023. This demonstrated that performance as measured using market share fluctuated in the period under the study, demonstrated the need to understand the link between value chain management and firm performance in food and beverage manufacturing sectors in Kenya

Profit margins refer to the percentage of revenue after deducting all expenses associated with running a business. Table 4.10 shows that the profitability of the food and beverage manufacturing firms was determined through returns on plan or investment by evaluating the ratio between total investments and total costs. On average, the firms reported 27.619% ROI, which increased to 33.958% in years 2020 and further increased to 41.067% in 2021. The ROI for the firms declined to 38.072% in 2022 and further declined to 36.465 % in 2023. This clearly demonstrated that the profitability of food and beverage manufacturing firms' experiences instability that could be linked to the impact of success in utilizing value chain management practices. On average, food and beverage companies can reach up to 54% profitability level as measured using ROI.

Table 4.10 shows the sales volume of food and beverage manufacturing firms in Kenya between 2019 and 2023 are shown in Table 4.10. In 2019, the sales volume of food and beverage manufacturing firms was Kshs 250.541 billion, which increased to Kshs 276.089 billion in 2020. In 2021, the sales volume was 301 billion before

increasing to 311.590 billion in the following year (2022) and finally declining to Kshs 295.714 billion in 2023. The results demonstrated sales volumes to show unstable trends in sales performance.

Table 4.10: Table of Organization Performance

Year	2019	2020	2021	2022	2023
Market Share (%)	11.557	14.3576	8.8584	12.0605	10.8951
Profitability, Sum Return on Investments (%)	27.619	33.958	41.067	38.072	36.465
Sales Volume (Billions)	250.541	276.089	301.617	311.590	295.714

Firms Performance Descriptive Analysis (Primary Data)

The study measured market share by the number of branches, customer base, and growth in sales achieved in food and beverage companies. The study sought the extent to which performance was achieved in food and beverage manufacturing firms in Kenya, and the results are presented in Table 4.11. From the results, 50% of the respondents agreed (M= 4.284, SD= 0.64980), 39.2% strongly agreed, while 10.8% were neutral that food and beverage manufacturing firms reported increased branches. The finding in Table 4.11, item two indicated that 46.9% of the respondents strongly agreed, 39.2% agreed, and 13.9% were neutral, and on average (M= 4.3308, SD= 0.70862) that food and beverage manufacturing firms reported an increase in several customers. This implied that there was an increase in the customer base of food and beverage manufacturing firms in Kenya. The aggregate mean of 4.2154 (SD=0.62238) showed that food and beverage manufacturing firms reported widespread and steady growth in the market as 56.9% agreed, 32.3% strongly agreed, and 10.8% remained neutral, as shown in table 4.11 in item three, the mean score was 4.2154 (SD 0.62238). The results concurred with Muwairwa (2019), who found that the sales volume of manufacturing industries with a focus drawn to Nile Breweries Limited in Njeru, Jinja district

The profitability of the companies was measured using return on assets, return on investment, and net profit margin. From the results in Table 4.11 item four, 55.4% of the respondents strongly agreed. In contrast, 34.6% agreed while 10.0% were neutral,

supported by an average (M= 4.4538 and SD=0.67182) that the companies reported regular increases in operational profit margin. This demonstrated that value chain management practices could have contributed to increased operation profit margin. From the results in Table 4.11, the majority (66.2%) of the respondents strongly agreed, and 20.0% agreed. In comparison, 13.8% were neutral, as supported by an average mean of 4.5231 (SD=0.72833), that food and beverage manufacturing firms achieved an increase in return on investment (ROI). Also, respondents (55.4%) strongly agreed, and 44.6% agreed, as supported by a mean of 4.5538 and a standard deviation of 0.49902, showing that food and beverage companies achieve an increase in gross profit margin. The findings were in line with Bhattacharya, Morgan, and Rego (2022), who found that manufacturing firms achieve high return on assets (ROA) and return on Sale (ROS) return on investment as a result of the integration of IT in marketing logistics.

The study sought to determine to what extent food and beverage manufacturing firms achieve sales performance. The results are in Table 4. 11 item seven: 44.6% of the respondents strongly agreed, 39.2% agreed, and 16.2% were neutral. This is supported by a mean (M= 4.2846, SD=0.72854) that food and beverage manufacturing firms achieve steadily improved sales performance.

The finding also revealed that 56.9% of the respondents strongly agreed, 29.3% agreed, and 13.8% were neutral, supported by a mean M=4.4308 and SD=.72538 that food and beverage companies achieved an increase in sales revenue. The results in Table 4.11 indicated that 46.9% of the respondents strongly agreed, and 53.1% agreed, supported by M= 4.4692, SD= 0.50098, that food and beverage manufacturing firms reported an increase in customer lifetime value (LTV).

The overall results mean = 4.39401 and SD = 0.64832 demonstrated that food and beverage companies achieved an increase in profitability level, increase in market share, and improvement in sales performance, which could be due to value chain management practices adopted in the manufacturing firms. The finding concurred with Ebuzoeme (2024), who posited that operations in marketing and deployment of product, price, place, and promotion strategies increase the volume of sales, market

share, and increase in number of customers in food and beverage companies in Nigeria. The finding concurred with Osio and Ehi (2023), who found that integrating technology in market strategies contributed to the sales performance of manufacturing companies in Delta State as the companies reported an increase in sales, customers, and sales revenue.

Table 4.11: Table of Performance of Food and Beverage firms

Statements	N	A	SA	Mean	Std. Dev.
The Organisation reported an increase in the number of branches	10.8%	50.0%	39.2%	4.2846	.64980
The Organisation has an increase in the number of customers	13.9%	39.2%	46.9%	4.3308	.70862
We have a popular and steady growth in the market	10.8%	56.9%	32.3%	4.2154	.62238
Regularly we have an increase in operational profit margin	10.0%	34.6%	55.4%	4.4538	.67182
There is an increase in return on investment (ROI) in the organization	13.8%	20.0%	66.2%	4.5231	.72833
The Organisation reported a yield in gross profit margin	0%	44.6%	55.4%	4.5538	.49902
The number of sales reported in the organization improved steadily	16.2%	39.2%	44.6%	4.2846	.72854
There is an increase in sales revenue in the organization	13.8%	29.3%	56.9%	4.4308	.72538
The Company reported an increase in customer lifetime value (LTV)	0.0%	53.1%	46.9%	4.4692	.50098
Aggregate Score				4.3940	0.6483

4.7 Qualitative Analysis

The respondents indicated that material management through transportation, order fulfilment, inventory control, and supplier relationship management contributed to increased sales, profitability, and market shares of companies' performance. The respondents further indicated that stock controls led to the fostering of supplier selection criteria, maintaining clear communication channels, deploying strategic sourcing processes in place to identify and select suppliers, tracking inventory levels,

and developing long-term relationships with key suppliers to enhance collaboration and value creation and achieve performance

The respondents were requested to indicate the benefits of material management in Kenya's food and beverage manufacturing firms. The respondents indicated that through demand forecasting, the firms accurately predict material based on historical data, market trends, and customer orders. Through inventory planning control, the respondents indicated that they achieved the goal of determining appropriate inventory levels based on demand forecasts, lead times, and service level objectives for food and beverage manufacturing firms in Kenya. Also, respondents indicated that material management through stock replenishment and inventory tracking production disruption that fosters timely replenishment is achieved in Kenya's food and beverage manufacturing firms.

Further respondents indicated that demand forecasting, future customer demands are determined, demand planning is done, demand and supply matching is achieved, minimizing stock outs or excess inventory, and demand collaboration is used to enhance communication and foster accurate demand forecasts**.**

The respondents indicated that effective coordination between the warehouse and outbound logistics ensures accurate inventory management that minimizes stockouts and overstocking, optimizing our inventory levels and reducing costs. Also, the importance of outbound logistics in enhancing customer service and maintaining strong relationships with retailers was emphasized. When asked for suggestions on improving outbound logistics in food manufacturing firms, respondents provided valuable insights. They emphasized the importance of technology, stating, "Investing in advanced logistics management systems and automation can streamline processes and improve efficiency." They also highlighted the significance of strategic partnerships: that is, reliable transportation providers can optimize delivery routes and ensure timely deliveries, implementing robust data analytics tools to provide valuable insights for continuous improvement, efficient inventory management was emphasized, and minimizing order processing times and preventing stockouts. The results are in line with the findings of Kinisa (2019), who opined that cost-driven

outsourcing led to improved organizational performance by reducing costs and risks while increasing operational efficiency, both in the short term and in the long term. Further, the study found that innovation-driven outsourcing improved organizational performance by enabling it to create, develop, and deliver value to the market faster than its competitors.

On how operations management influences the performance of food and beverage manufacturing firms. The respondents indicated that efficient production processes, one individual stating, streamlining our production operations, optimizing workflows, and ensuring smooth coordination among different departments have significantly improved our productivity and overall performance. They also emphasized the importance of quality control in operations management. They explained that implementing rigorous quality control measures and adhering to strict standards throughout production has helped them maintain high product quality, enhancing customer satisfaction and brand reputation. Furthermore, respondents recognized the role of inventory management in operations management.

Respondents also highlighted the significance of effective value chain management. A respondent stated, "Efficient coordination with suppliers, timely procurement of raw materials, and streamlined logistics operations have enabled us to minimize lead times, reduce stockouts, and enhance our ability to meet customer demands, ultimately improving our performance. “The importance of continuous improvement and process optimization was raised. They mentioned that regularly analyzing their processes, identifying bottlenecks, and implementing process improvements based on lean manufacturing principles have increased efficiency, reduced waste, and improved overall performance. Additionally, the role of workforce management in operations management was emphasized. A respondent stated, "Investing in training, development programs, promoting a culture of employee empowerment engagement, and ensuring a skilled and motivated workforce are crucial aspects of operations management that contribute to our performance and competitiveness. “From streamlining production processes and ensuring quality control to effective inventory management, value chain coordination, process optimization, workforce

management, and operations management plays a critical role in enhancing performance and driving success in the industry.

The respondents were requested to indicate ways of improving operations management to benefit food manufacturing firms; respondents provided valuable insights on enhancing operational efficiency and effectiveness. Respondent emphasized the importance of leveraging technology, stating that investing in advanced operations management systems and automation can streamline processes, improve data accuracy, and enhance overall operational efficiency." Another suggestion focused on optimizing value chain integration. A respondent mentioned, "Developing strong relationships with suppliers, implementing capacity planning processes, and adopting real-time communication systems can improve supply chain visibility, reduce lead times, and enhance operational performance." Respondents also highlighted the significance of continuous process improvement. They explained that implementing lean manufacturing principles, conducting regular process evaluations, and involving employees in problem-solving initiatives can drive operational excellence, reduce waste, and improve overall efficiency.

The respondents indicated that adopting quality assurance processes, conducting regular inspections, and implementing rigorous quality control measures can ensure consistent product quality, customer satisfaction, and brand reputation. Lastly, sustainability practices were mentioned as a way to improve operations management. Kuria and Kariuki (2022) and Chompunuch, Apsorn Kachonkitiya (2022) supported the results, stating that operations process optimization, product scheduling, capacity planning, and product scheduling contributed to an increase in firm market share, sale performance, and profit margin.

When asked about the other ways in which inbound logistics affect the performance of food and beverage manufacturing firms in Kenya, respondents provided various aspects of inbound logistics and their impact on overall performance. One key aspect highlighted by respondents was the importance of reliable and efficient supplier relationships. A respondent stated, "Establishing strong partnerships with suppliers can ensure timely and consistent delivery of raw materials, which is crucial for

maintaining smooth production processes and meeting customer demands." Another significant factor mentioned was the effective management of inventory and stock levels. A respondent explained, "Optimizing inventory control and implementing just-in-time practices can minimize storage costs, reduce the risk of stockouts, and improve cash flow, ultimately enhancing overall performance." Respondents also emphasized the significance of transportation and logistics infrastructure. One respondent mentioned, "Investing in well-maintained transportation fleets and leveraging efficient transportation routes can ensure timely and cost-effective delivery of finished goods to customers, contributing to customer satisfaction and repeat business."

The respondents asserted that technology integration and data analytics foster real-time tracking, enhance visibility, improve route optimization, and enable proactive decision-making, leading to more efficient inbound logistics and overall performance improvement. Further respondents indicated that IT integration contributed to streamlining communication channels, fostering collaboration, and sharing relevant information among all parties, improving coordination, reducing errors, and enhancing overall operational efficiency.

When considering the impact of technology management and the performance of food and beverage manufacturing firms in Kenya, respondents provided various ways technology influences their operations. They suggested ways to improve technology management for their benefit. Respondents highlighted the importance of embracing automation and digitization in their operations. Bolatana, Alpkan, and Zaim (2023) established that technology transfer performance has a positive and substantial impact on total quality management, but it has no significant effect on quality performance. A positive and strong relationship was determined between total quality management and quality performance. The relationship between technology transfer performance and quality performance has become significant with the mediating role of total quality management.

4.8 Hypotheses testing

The study sought to test the hypotheses. Table 4.12 indicates the results of the hypotheses, the variables that were tested, the results of the hypotheses, and the explanation of the results. The F calculated was 11.578, with PV=0.001 being far greater than F-Critical 3.9146. The condition $F_{Cal.}$ = 11.578> $F_{Cri.}$ =3.915) and PV=0.001 indicate that the null hypothesis is rejected and that there exists no significant relationship between material management and the performance of food and beverage manufacturing firms in Kenya

The ANOVA results in Table 4.12, the F calculated 92.865, with PV=0.000<0.05, was far greater than F-Critical 3.9146. The condition $F_{Cal.}$ = 92.865> $F_{Cri.}$ =3.9146 and PV=0.001<0.05 indicate that the null hypothesis is rejected and that there exists no significant relationship between outbound and performance of Food and beverage manufacturing firms in Kenya. From ANOVA results in Table 4.12, the F calculated 121.761, with PV=0.000<0.05, was far greater than F-Critical 3.9146. The condition $F_{Cal.}$ = 121.761> $F_{Cri.}$ =3.9146 and PV=0.000<0.05 indicate that the null hypothesis is rejected and that no significant relationship exists between Operations Management and the performance of Food and beverage manufacturing firms in Kenya.

From ANOVA results in Table 4.12, the F calculated 94.149, with PV=0.000<0.05, was far greater than F-Critical 3.915. The condition $F_{Cal.}$ = 94.149> $F_{Cri.}$ =3.915 and PV=0.000<0.05 indicate that the null hypothesis is rejected and that no significant relationship exists between inbound logistics and the performance of Food and beverage manufacturing firms in Kenya. From ANOVA results in Table 4.12, the F calculated 22.747, with PV=0.000<0.05, was far greater than F-Critical 2.287. The condition $F_{Cal.}$ = 22.778> $F_{Cri.}$ =2.287 and PV=0.000<0.05 indicate that the null hypothesis is rejected and that there exists no significant moderating effect of value chain management practices and the performance of Food and beverage manufacturing firms in Kenya.

Table 4.12: Results of Hypotheses Testing

Hypothesis Number	Variables	F-Statistics.		Verdict
To determine the relationship between material management and the performance of food and beverage manufacturing firms in Kenya	Material management	$F_{Cal.}$ =11.578	$F_{Cri.}$ = 3.915	Pv=0.001<0.05, Null hypothesis Rejected. There is a significant relationship between Material management and the performance of food and beverage manufacturing firms in Kenya.
To establish how outbound logistics relates to the performance of food and beverage manufacturing firms in Kenya.	outbound logistics	$F_{Cal.}$ = 92.865	$F_{Cri.}$ = 3.915	Pv=0.001<0.05 Null hypothesis Rejected There is a significant relationship between Outbound Logistics and the performance of food and beverage manufacturing firms in Kenya.
To evaluate the relationships between operations management on the performance of food and beverage manufacturing firms in Kenya	operations management	$F_{Cal.}$ = 121.761	$F_{Cri.}$ = 3.915	Pv=0.001<0.05 Null hypothesis Rejected Operations management has a significant relationship with the performance of food and beverage manufacturing firms in Kenya.
To establish the relationship between inbound logistics and the performance of food and beverage manufacturing firms in Kenya	inbound logistics	$F_{Cal.}$ = 94.149	$F_{Cri.}$ = 3.915	Pv=0.001<0.05 Null hypothesis Rejected There is a significant relationship between Inbound Logistics and the performance of food and beverage manufacturing firms in Kenya.
To assess the moderating effect of Technological Integration and the relationship between value chain practices and the performance of food and beverage manufacturing firms in Kenya	Technological Integration	$F_{Cal.}$ = 22.747 $F_{Cri.}$ = 2.287 $R^2 2 > R^2 1 = 0.634$ $R^2 2 = 0.637$		Pv=0.001<0.05Null hypothesis Rejected Technological integration has a significant moderating effect in the relationship between value chain management practices and the performance of food and beverage manufacturing firms in Kenya

4.9 Diagnostic Tests

This section presents the findings of the study's test of regression assumptions before conducting inferential statistics. The test of assumptions aims to ensure that the data is adequate for regression analysis to avoid spurious regression results. The tests conducted include normality, linearity, multicollinearity, homoscedasticity, and heteroscedasticity.

4.9.1 Test for Normality

According to Creswell (2019), the variables should be roughly normally distributed, especially if the results are to be generalized beyond the sample. The study used the Kolmogorov-Simonov and Shapiro tests of normality tests. Under the Shapiro test, the null hypothesis H_0 is generally distributed, while the H_a: Data is not normally distributed. Since the p-values for all the variables were more significant than 0.05, the null hypotheses for all the variables were not rejected, hence confirming that data was normally distributed and, therefore, fit for linear regression analysis. These findings are supported by Casteel and Bridier (2021), who argued that the variables are supposed to be roughly normally distributed, especially if the results are to be generalized beyond the sample.

Table 4.13: Table of Normality Test

Variable	Kolmogorov- Smirnov			Shapiro Wilk		
	Statistics	Df	Sig	Statistic	Df	Sig
Material management	0.875	130	0.120	0.982	130	0.453
Outbound logistics	0.941	130	0.098	0.988	130	0.528
Operations management	0.971	130	0.067	0.986	130	0.632
Inbound logistics	0.831	130	0.077	0.984	130	0.196
Technological integration	0.971	130	0.193	0.987	130	0.249
Performance of food and beverage manufacturing firms	0.904	130	0.109	0.985	130	0.378

Normal QQ plots

To support normality results as presented by the skewness and kurtosis results, the graphical analysis results were carried out to indicate that the line representing the actual data distribution closely follows the diagonal in the normal Q-Q plot, as shown in Figure 4.1. The quantile-quantile (q-q plot) plot is a graphical method for determining if a dataset follows a specific probability distribution or whether two data samples came from the same population. Q-Q plots are particularly useful for assessing whether a dataset is normally distributed or if it follows some other known distribution

The graphical results reveal a normal distribution of data. In the q-q plot, or the normal probability plot, the observed value for each score is plotted against the expected value from the normal distribution, where a sensibly straight line suggests a normal distribution (Pallant, 2007). If the points in a q-q plot depart from a straight line, the assumed distribution is called into question (Aas & Haff, 2006). From the q-q plot's output results, the data points are close to the diagonal line, indicating that the data is usually distributed.

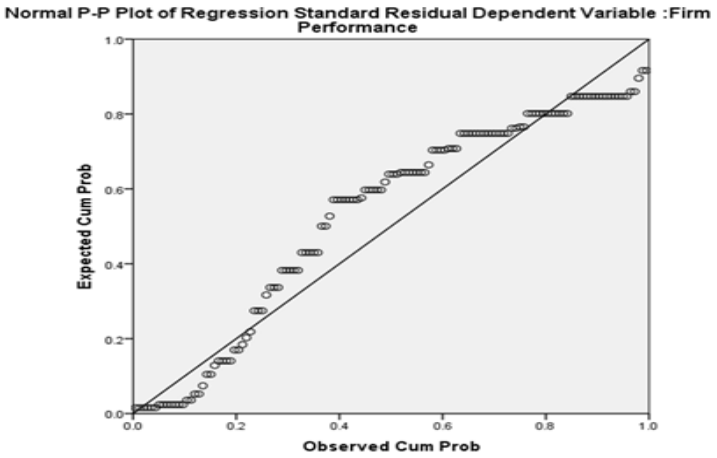

Figure 4.1: Normal Q-Q Plots for Value Chain Management and Performance of Food and Beverage Manufacturing Firms

4.9.2 Test for Linearity

As a test for linearity in Table 4. 14, the Goodness of Fit test was applied. This summarizes the discrepancy between the observed and expected values under a statistical model. One can also compute or develop an Analysis of variance (ANOVA) table for any pair of variables' linear and nonlinear components. If the F significance value for the nonlinear component is below the critical value (ex., < .05), then there is significant nonlinearity (Bhattacherjee, 2018). Since the p-value of f-statistics was less than 0.05 in Table 4.14, the study rejected the null hypothesis of significant nonlinearity and concluded that the variable adhered to linearity assumptions.

Table 4.14: Table of Linearity Test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	71.146	4	17.786	202.113	.000[b]
	Residual	11.002	125	.088		
	Total	82.148	129			

a. Dependent Variable: Performance of Food and Beverage Manufacturing firms
b. Predictors: (Constant), Inbound Logistics, Material Management, Outbound Logistics, Operations Management

4.9.3 Multicollinearity

Multicollinearity is a statistical phenomenon in which a perfect or exact relationship exists between the predictor variables, making it challenging to obtain reliable estimates of their coefficients (Shrestha, 2020). A VIF more significant than 10 indicates a high correlation that may be problematic and would require the researcher to remove highly correlated predictors from the model. The study adopted VIF to test for multicollinearity.

The findings in Table 4.15 revealed that material management had a VIF of 5.214, outbound logistics had a VIF of 8.399, and operations management had a VIF of 3.361. In contrast, inbound logistics had a VIF of 3.566. These results indicated that the VIF values of the variables were within the threshold of 10. This indicated that there was no significant threat of multicollinearity. Therefore, the study could

include all the variables in linear regression analysis because there was no independent variable with a strong linear relationship with any other independent variable. According to Mohyaldeen and Alhassawy (2022), if the multicollinearity assumption is not satisfied and the independent variables are thus multicollinearity, the result is that the individual regression Coefficients for each variable are not identifiable: in fact, the closer the linear correlation between the independent variables, the less the certainty with which these coefficients may be identified. The occurrence of high standard errors generally reveals this imprecision in the estimate of the regression coefficients.

Table 4.15: Table of Multicollinearity Test

	Collinearity Statistics	
Variable	**Tolerance**	**VIF**
Material management	0.192	5.214
Outbound logistics	0.119	8.399
Operations management	0.298	3.361
Inbound logistics	0.280	3.566

A dependent Organization's performance

4.9.4 Test for Homoscedasticity

Violation of homoscedasticity tends to inhibit critical evaluation of forecast errors of standard deviation, which often leads to confidence intervals that are incredibly narrow or extremely wide (Kothari, 2018). Homoscedasticity in this study was assessed using the Breusch-Pagan test. The null hypothesis for this test was that the error variances were equal and were a multiple function of variables. Homoscedasticity occurs when the chi-square value exceeds the significance level (0.05). As indicated in Table 4.16, the chi-square value was 0.3274, more significant than the significance level of 0.05. This implies that there was homoscedasticity in the regression model.

Table 4.16: Table of Homoscedasticity Test

Ho: Constant variance **Variables: Performance of food and beverage manufacturing firms**	
Chi2 (1)	0.96
Prob>chi2	0.3274

4.9.5 Test for Heteroscedasticity

The occurrence of variance of errors that varies across observations in a study would indicate the existence of heteroscedasticity. Breusch-Pagan was used to test the null hypothesis, which indicates that the error of variance is all equal relative to alternatives and that the error variance is a multiplicative model of one or more variables. The Breusch-Pagan test the null hypothesis that heteroscedasticity is absent, implying that homoscedasticity exists. The threshold for acceptance is if the P-value is less than 0.05, the null hypothesis is rejected. A considerable Chi-Square value greater than 9.22 would indicate the presence of heteroscedasticity (Kothari, 2018). From the results in Table 4.17 the Chi-Square values resulting from each regression where every independent variable is considered singly were 5.86914, 6.62149, 7.10325, and 8.18759, revealing that heteroscedasticity did not exist. The null hypothesis tested was that variance is constant versus the alternative that variation was not constant for material management, outbound Logistics, Operations Management, and inbound Logistics. In summary, the Chi-Square value of 6.01597 resulting from overall regression exhibits that heteroscedasticity did not exist; hence, the variance of errors was constant.

Table 4.17: Table of Breusch-Pagan Test for Heteroscedasticity

H_0	Variable	Chis2(1)	Prove>Chi2
Constant Variance	Material Management	5.86914	0.00165
Constant Variance	Outbound Logistics	6.62149	0.12047
Constant Variance	Operation Management	7.10325	0.01826
Constant Variance	Inbound Logistics	8.18759	0.31735
Constant Variance	Technological Integration	6.08941	0.29573

Breusch-Pagan for Heteroscedasticity

H_0	Variable	Chis2(1)	Prov>Chi2
Constant Variable	Material Management Outbound Logistics Operation Management Inbound Logistics	6.01597	0.001594

To corroborate the Breusch-Pagan results for heteroscedasticity, further scatter plots (Figure 4.2) created using residual results were utilized to assess the presence of heteroscedasticity. The scatter plots for value chain management practices and firm performance in the food and beverage manufacturing sectors displayed an approximate linear relationship, where the plots spread initially. Then, they converged before showing constant variations, indicating that heteroscedasticity did not exist and that the variance of errors remained constant.

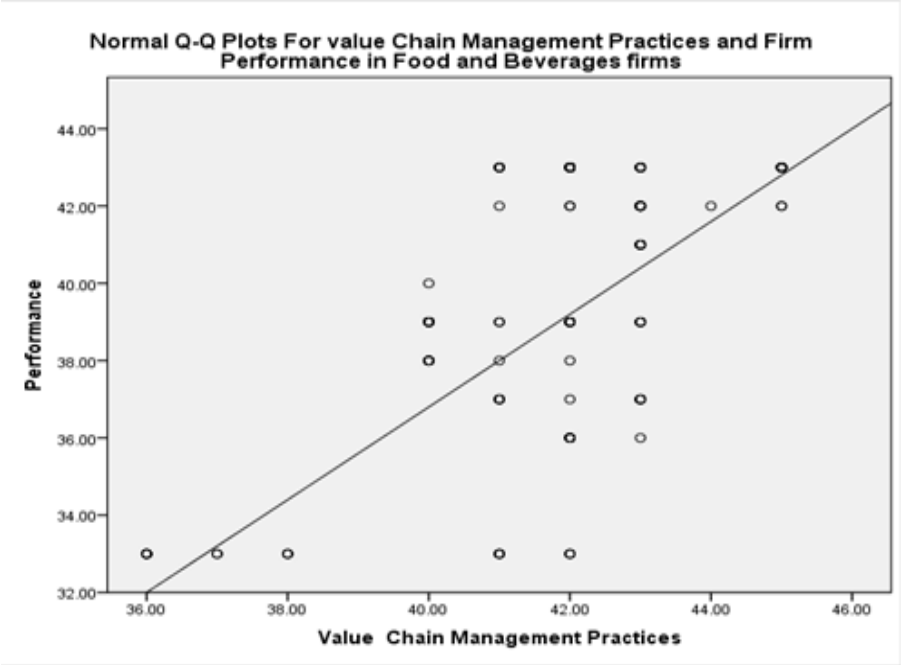

Figure 4.2: Normal P-P Plots Test for Heteroscedasticity

4.10 Inferential Statistics Analysis

Pearson correlation coefficient and regression analysis were used to undertake inferential data analysis for statistical exploration. The study established the relationship between variables using correlation analysis and regression models. The inferential analysis sought to establish the relationship between the independent and dependent variables.

4.10.1 Correlation Analysis

Correlation analysis measures the strength and direction of the linear relationship between two variables. The Pearson correlation coefficient was used to test associations between the independent and the dependent variables. If the correlation values are r = ±0.1 to ±0.29, then the relationship between the two variables is weak; if it is r = ±0.3 to ±0.49, the relationship is moderate; and when r= ±0.7 and above, there is a strong correlation between the two variables under consideration.

4.10.2 Correlation Between Value Chain Management and Performance

From the correlation results in Table 4.36, there existed a substantial, significant, and positive correlation between material management and the performance of food and beverage manufacturing firms in Kenya, as indicated by the correlation factor, r=0.809, PV=0.001<0.01. Material management predicts a strong and positive relationship with the performance of food and beverage manufacturing firms in Kenya. The findings demonstrated that Material management strongly predict performance, as measured using market share, profitability, and sales volume in Kenya's food and beverage manufacturing firms. Ifeyinwa (2022) also found that material procurement strategy has a significant positive relationship with organizational productivity in plastic manufacturing companies in Anambra State and that material management has a significant positive relationship with organizational productivity.

The correlation results in Table 4.18 established that there exists a strong, positive, and significant correlation between outbound logistics and the performance of food and beverage manufacturing firms. This is evidenced as correlation factors were r=0.898, PV=000<0.05. This clearly implied that outbound logistics predict a strong, positive, and significant relationship with the performance of food and beverage manufacturing firms in Kenya. The results implied that outbound logistics is a strong predictor of performance as measured using market share, profitability, and sales volume in the performance of food and beverage manufacturing firms in Kenya. Ihunwo and Ikegwuru (2023) opined that outbound logistic outsourcing correlates to performance as companies reported increased sales volumes, increased customer base, and improved company profitability levels.

The correlation findings in Table 4.18 revealed that there exists a strong, significant, and positive correlation (r=0.821, PV=0.000<0.01) between operations management and the performance of food and beverage manufacturing firms in Kenya. The findings predict a strong, positive, and significant relationship between operations management and the performance of food and beverage manufacturing firms in Kenya. The findings implied that operations management would contribute

significantly to achieving performance as measured using market share, profitability, and sales volume in the performance of food and beverage manufacturing firms in Kenya. Gadwe and Sangode (2019) found that there existed a positive and significant correlation between processing time/speed, work scheduling, staff scheduling, responsiveness, on-time delivery, quality control, maintenance, resource capacity planning, just-in-time, and procurement purchasing are highly implemented operations management activities and company's performance.

The correlation findings in Table 4.18 establish that there exists a strong, significant, and positive correlation ($r=0.778$, $PV=0.000<0.01$) between inbound logistics and the performance of food and beverage manufacturing firms in Kenya. The findings predict a strong, positive, and significant relationship between inbound logistics and the performance of food and beverage manufacturing firms in Kenya. The findings implied that inbound logistics would contribute significantly to achieving performance as measured using market share, profitability, and sales volume in the performance of food and beverage manufacturing firms in Kenya.

These findings are consistent with existing empirical literature. For instance, Thi *et al.* (2022) argues that efficient inbound logistics enhances supply chain responsiveness and reduces operational costs, which ultimately improves organizational performance. Similarly, Rahman and Naresuan (2019) note that effective management of inbound logistics, including supplier coordination, inventory control, and timely delivery of raw materials, plays a critical role in enhancing firm competitiveness and overall performance.

In addition, a study by Chami (2019) found that inbound logistics practices such as supplier relationship management, inventory optimization, and procurement efficiency have a significant positive effect on firm performance. Likewise, Tembo and Mutono-Mwanza (2024) established that inbound logistics capabilities significantly influence operational efficiency and customer satisfaction, which in turn drive organizational performance.

Table 4.18: Correlation Between Value Chain Management and Performance

		Firm Performance	Material Management	Outbound Logistics	Operations Management	Inbound Logistics
Firm Performance	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	130				
Material management	Pearson Correlation	.809**	1			
	Sig. (2-tailed)	.001				
	N	130	130			
Outbound logistics	Pearson Correlation	.898*	.183	1		
	Sig. (2-tailed)	.000	.320			
	N	130	130	130		
Operations management	Pearson Correlation	.821**	.297**	.193**	1	
	Sig. (2-tailed)	.000	.072	.080		
	N	130	130	130	130	
Inbound logistics	Pearson Correlation	.778**	.412**	.236**	.187**	1
	Sig. (2-tailed)	.000	.061	.070	.072	
	N	130	130	130	130	130

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

4.11 Statistical Modelling

Statistical modelling is a research approach that uses mathematical representations to analyse relationships between variables, test hypotheses, and make predictions under uncertainty. It combines theory, data, and statistical techniques to estimate parameters and explain patterns, with advanced methods such as structural equation modelling and Bayesian inference enabling analysis of complex data. Recent studies

emphasize model validation, data quality, and alignment with research objectives (Koković et al., 2024; Popovic, 2024; Saltelli & Di Fiore, 2023).

4.11.1 Simple Linear Regression

The study examined the relationship between value chain management practices and the performance of food and beverage manufacturing firms in Kenya. Multiple regression analysis. Multiple regression analysis also guided the study in testing the research hypothesis. The model's predictive power was based on R2, while the F-statistic was used to determine the model's fitness at P -P-value < 0.05. The significance of the study variables was also based on P-values at a 0.05 significance level. The following null hypotheses were tested:

4.11.2 Simple Linear Regression for Material Management

The study's first objective was to determine the relationship between material management and the performance of food and beverage manufacturing firms in Kenya.

From this, the first hypothesis of the study was drawn:

H_{O1}: Material management has no significant relationship with the performance of Kenya's food and beverage manufacturing firms.

This was tested using a simple linear regression model;

$$\mathbf{Y = \beta_0 + \beta_1 X_1 + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \{i\}}$$

The model summary in Table 4.19 indicates the R-squared is 0.083, indicating that there exists a variation between material management and performance of food and beverage manufacturing firms in Kenya. The model summary finding indicates R^2 =0.083, Std Error 3.33049, revealing that material management contributes to a significant variation at 8.3% of market share, profitability, and sale performance in food and beverage manufacturing firms in Kenya. The ANOVA results in Table 4.19 indicate that the F-calculated was 11.578 with a PV 0.001< 0.05. The F-calculated is

greater than f-critical; this clearly demonstrated that the simple regression model $Y = \beta 0 + \beta 1X_1 + \varepsilon$ adopted by the study had significant goodness of fit as Fcal=11.578 far exceeds the Fcri= 0.09 and PV=0.001<0.05. The F calculated was 11.578, with PV=0.001 being far greater than F-Critical 3.9146. The condition $F_{Cal.} = 11.578 > F_{Cri.} = 3.9146$) and PV=0.001 indicate that the null hypothesis is rejected. The alternative hypothesis is accepted that a significant relationship exists between material management and the performance of food and beverage manufacturing firms in Kenya.

The result of a simple linear regression model took the form.

$Y=14.721+0.592X_1+ę.$

The regression results revealed that material management had a significant and positive relationship with the performance of food and beverage manufacturing firms in Kenya as $\beta_1 = 0.592$, PV=0.001<0.05, t= 3.403. The finding demonstrates that a unit increase in material management would lead to an increase of 0.592 in the performance of food and beverage manufacturing firms in Kenya. This finding is supported by prior empirical studies. For instance, Thuku and Kombo (2019) argue that effective material management enhances operational efficiency by ensuring timely availability of raw materials, minimizing production disruptions, and reducing inventory holding costs, which ultimately improves organizational performance. Similarly, Essel (2021) assert that strategic material management practices, including procurement planning, supplier selection, and inventory control, significantly contribute to improved firm productivity and profitability. The condition of null hypothesis where $\beta_1 \neq 0$, PV-0.001<0.05 is rejected, and the alternative hypothesis is accepted. Therefore, material management has a significant and positive relationship with the performance of food and beverage manufacturing firms in Kenya.

Table 4.19: Material Management

Model Summary

	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.288[a]	.083	.076	3.33049

ANOVA

Sum of Squares	Sum of Squares	df	Mean Square	F	Sig.
Regression	128.426	1	128.426	11.578	.001[b]
Residual	1419.797	128	11.092		
Total	1548.223	129			

Coefficients

		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	14.721	7.302		2.016	.046
	Material management	.592	.174	.288	3.403	.001

a. Predictors: (Constant), material management

b. Dependent Variable: performance of food and beverage manufacturing firms

4.11.3 Simple Linear Regression for Outbound Logistics

The study's second objective was to assess the relationship between outbound logistics and the performance of food and beverage manufacturing firms in Kenya. In seeking to achieve the objective, the study tested the second null hypothesis,

H_{O2}: Outbound Logistics has no significant relationship with the performance of Kenya's food and beverage manufacturing firms.

This was tested using a simple linear regression model;

$$\mathbf{Y = \beta_0 + \beta_2 X_2 + \varepsilon} \quad \textbf{……(ii)}$$

The model summary in Table 4.20 indicates the R-squared is 0.420, indicating that there exists a variation between outbound logistics and the performance of food and beverage manufacturing firms in Kenya. The model summary finding indicates R^2 =420, Std Error= 2.64761 revealed that outbound contributes to a significant variation at 42.0% of performance as indicated by market share, profitability, and sale performance in food and beverage manufacturing firms in Kenya. The ANOVA results in Table 4.38 indicate that the F-calculated was 92.865 with a PV 0.000< 0.05. This clearly demonstrated that the simple regression model $Y = \beta_0 + \beta_2 X_2 + \varepsilon$ adopted by the study had significant goodness of fit as Fcal=92.865 far exceeds the Fcri= 3.915 and PV=0.001<0.05.

The resultant simple regression model took the form:

$Y=14.721+0.750X_2+ę.$

The regression results revealed that outbound logistics had a significant and positive relationship with the performance of food and beverage manufacturing firms in Kenya as β_2 = 0. 750, PV=0.000<0.05, t= 9.637. The finding demonstrates that a unit increase in outbound logistics would lead to an increase of 0.750 in the performance of food and beverage manufacturing firms in Kenya. The condition of null hypothesis where $\beta_2 \neq 0$, PV=0.000<0.05 is rejected, and the alternative hypothesis is accepted. Therefore, outbound logistics has a significant and positive relationship with the performance of food and beverage manufacturing firms in Kenya. These findings agree with Helo and Shamsuzzoha (2020), who found that results, material handling, order processing, automation, and optimization contributed significantly to increasing profitability, improving sales, and attracting more customers.

Table 4.20: Outbound Logistics

Model Summary

	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.648[a]	.420	.416	2.64761

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	650.965	1	650.965	92.865	.000[b]
Residual	897.258	128	7.010		
Total	1548.223	129			

Coefficients

		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.817	2.783		4.605	.000
	Outbound Logistics	.750	.078	.648	9.637	.000

a. Predictors: (Constant), Outbound Logistics

b. Dependent Variable: Performance of Food and Beverage Manufacturing Companies

4.11.4 Simple Linear Regression for Operations Management

The study's third objective focused on establishing a relationship between operations management and the performance of food and beverage manufacturing firms in Kenya. In seeking to achieve the objective, the study tested the third null hypothesis,

H_{O3}: Operations Management has no significant relationship with the performance of food and beverage manufacturing firms in Kenya.

This was tested using a simple linear regression model;

$$\mathbf{Y = \beta_0 + \beta_3 X_3 + \varepsilon} \text{ ..... (iii)}$$

The model summary in Table 4.21 indicates that the R-squared is 0.487, indicating that there exists a variation between operations management and the performance of food and beverage manufacturing firms in Kenya. The model summary finding

indicates R^2 =0.487, Std Error= 2.48974, revealing that operations management contributes significant variation at 48.7% of performance as indicated by market share, profitability, and sale performance in food and beverage manufacturing firms in Kenya. The ANOVA results in Table indicate that the F-calculated was 94.149 with a PV 0.000< 0.05. This clearly demonstrated that the simple regression model $Y = \beta_0 + \beta_3 X_3 + \varepsilon$ adopted by the study to study the relationship between operations management and performance of the food and beverage companies had a significant goodness of fit as F=94.149 at PV=0.000<0.05.

The resultant simple regression model took the form: **$Y=6.591+0.111X_3+ę$.**

The regression results revealed that operations management had a significant and positive relationship with the performance of food and beverage manufacturing firms in Kenya as β_3 = 0. 111, PV=0.000<0.05, t= 11.035. The finding demonstrates that a unit increase in operations management would lead to an increase of 0.111 in the performance of food and beverage manufacturing firms in Kenya. The condition of the alternative hypothesis where $\beta\ 3 \neq 0$, PV=0.000<0.05 is accepted, and the null hypothesis is rejected. Therefore, operations management has a significant and positive relationship with the performance of food and beverage manufacturing firms in Kenya. Plamen, Pavel, and Ivan supported the results. (2023) carried out a study on an optimization model for production scheduling, taking into account preventive maintenance in an uncertainty-based production system, contributing to cost savings and improved efficiency of the production process and leading to improving the financial performance of the firms.

Table 4.21: Operation Management

Model Summary

	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.698[a]	.487	.484	2.48974

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	754.774	1	754.774	94.149	.000[b]
Residual	793.449	128	6.199		
Total	1548.223	129			

Coefficients

		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.591	4.4760		2.176	.031
	Operation Management	0.111	.0109	.098	9.703	.000

a. Predictors: (Constant), Operations Management

b. Dependent Variable: Performance of Food and Beverage Manufacturing Companies

4.11.5 Simple Linear Regression for Inbound Logistics

The study's fourth objective explored establishing a relationship between inbound logistics and the performance of food and beverage manufacturing firms in Kenya. The study sought to test the fourth null hypothesis,

H_{O4}: Inbound Logistics has no significant relationship with the performance of Kenya's food and beverage manufacturing firms.

This was tested using a simple linear regression model;

$$\mathbf{Y = \beta_0 + \beta_4 X_4 + \varepsilon \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (iv)}$$

The model summary in Table 4.22 indicates the R-squared is 0.424. This revealed a variation between inbound logistics and the performance of food and beverage

manufacturing firms in Kenya. The model summary finding indicates R^2 =0.424, Std Error= 2.63994 revealed that inbound logistics contribute significant variation at 42.4% of performance as indicated by market share, profitability, and sale performance in food and beverage manufacturing firms in Kenya. The ANOVA results in Table indicate that the F-calculated was 121.761 with a PV 0.0169< 0.05. This clearly demonstrated that the simple regression model $Y = \beta_0 + \beta_4 X_4 + \varepsilon$ adopted to study the relationship between inbound logistics and the performance of the food and beverage companies had a significant goodness of fit as F=121.761 at PV=0.000<0.05.

The resultant simple regression model took the form:

$Y=6.591+0.121X_4+ę$.

The regression results in Table 4.22 revealed that inbound logistics had a significant and positive relationship with the performance of food and beverage manufacturing firms in Kenya as β_4 = 0. 121, PV=0.0169<0.05, t= 11.035. The finding demonstrates that a unit increase in inbound logistics would lead to an increase of 0.121 in the performance of food and beverage manufacturing firms in Kenya. The condition of the alternative hypothesis where $\beta\ 4 \neq 0$, PV=0.0169<0.05 is accepted, and the null hypothesis is rejected. Therefore, inbound logistics has a significant and positive relationship with the performance of food and beverage manufacturing firms in Kenya.

Table 4.22: Inbound Logistics

Model Summary

	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.651[a]	.424	.420	2.63994

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	656.155	1	656.155	121.761	.000[b]
Residual	892.068	128	6.969		
Total	1548.223	129			

Coefficients

		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.729	4.760		1.384	.0169
	Inbound Logistics	0.121	.0114	.651	9.703	.000

a. Predictors: (Constant), Inbound Logistics

b. Dependent Variable: Performance of Food and Beverage Manufacturing Companies

4.12 Multiple Linear Regression Analysis

The study conducted multiple regression analyses to determine whether combined total sum variables predict dependent variables. The study conducted multiple regression analysis because it involved more than one independent variable. The multiple models considered all the variables, material management, outbound logistics, operations management, and inbound logistics, as predictors of the performance of food and beverage manufacturing firms in Kenya.

4.12.1 Multiple Linear Regression Analysis (Unmoderated)

From the model summary results, the R-squared was 0.635. This revealed that significant variation existed between value chain management practices, material management, outbound logistics, operations management, and inbound logistics, as

well as the performance of food and beverage manufacturing firms. From the model summary in Table 4.23, the value of R^2 is 0.635, implying that there was a significant variation of 63.5% of food and beverage manufacturing firms due to changes in material management, outbound logistics, operations management, and inbound logistics. The finding demonstrated that combined material management, outbound logistics, operations management, and inbound logistics as value chain management practices explain up to 63.5% variation in the performance of food and beverage manufacturing firms in Kenya.

The ANOVA results test whether there is a goodness of fit of the model. ANOVA results indicated a total variance of 54.247 as the difference in the variance, which can be explained by value chain management practices, and the variance, which was not explained by the independent variables. The multiple models of the study tested for the goodness of fit were fitted

$$\mathbf{Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon.}$$

The F-calculated of 54.247 reported at 0.000< 0.05 was more significant than the F-Critical of 0.5761, clearly revealing that multiple model $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$ attained goodness of fit and therefore suitable further analysis to explain the relationship between value chain management practices and performance of food and beverage manufacturing firms in Kenya.

The beta coefficient analysis in Table 4.23 shows that the constant value in the regression model was α=33.541. This revealed that holding value chain management constant, the performance of food and beverage firms would be at 33.541, as contributed by other predictors of performance not explained by value chain management practices.

Multiple regression results revealed that material management has a positive and significant relationship with the performance of food and beverage firms as indicated by B_1 =0.142, PV=0.001>0.05, t=11.040). This clearly indicated that a unit increase in material management would lead to a significant increase in the performance of food and beverage companies by B_1=0.142. The results were supported by Nyongesa

and Shale (2019). The basic functionality of materials management includes various factors, such as supply, material pricing, and usage, that contribute to firm performance in large manufacturing companies in Kenya.

Regression results revealed that outbound logistics had a significant and positive relationship with the performance of food and beverage companies (B_2= 0. 131, PV = .002<0.05, t=9.340). The results revealed that a unit increase in outbound logistics would significantly increase the performance of food and beverage manufacturing firms in Kenya by regression factor B_2= 0. 131. The findings concurred with Hura et al. (2024) that material handling, order processing, automation, and optimization contributed significantly to increasing profitability, improving sales, and attracting more customers.

The beta coefficient results show a significant and positive relationship between operations management and the performance of food and beverage manufacturing firms in Kenya, as indicated by (B_3= 0.754, PV = .000<0.05, t=6.869). The results demonstrated that a unit increase in operations management would significantly increase food and beverage manufacturing firms' performance by regression factor B_3= 0. 754. The results were supported by Walker and Strickler (2020), who conducted a study on the impact of operations management practices on firm performance and found that operations practices contributed to improving performance and gaining competitive advantages.

The finding in Table 4.23 also revealed that inbound logistics contribute significantly and positively to an increase in the performance of food and beverage manufacturing firms in Kenya as indicated by regression factor B_4= 0.981, PV = .000<0.05, t=5.356). The finding implied that a unit increase in inbound logistics would contribute to a significant increase in the performance of food and beverage manufacturing firms in Kenya by regression factor 0.981. The results concurred with Chami (2019) that a sufficient transportation fleet, followed by cost-cutting, affects competitive performance and a significant amount of productive results, cost savings, customer satisfaction, and quick replies (JIT). Also, Rahman and Naresuan (2019) revealed that inbound logistics, receiving of goods, storage capacity, and inventory

control contribute significantly to return on asset, reduction in cost of operations, and improved productivity. The resultant multiple regression analysis is;

$$\mathbf{Y = 33.541 + 0.981X_1 + 0.754X_2 + 0.142X_3 + 0.131X_4 + \varepsilon}$$

Table 4.23: Multiple Linear Regression Analysis (Unmoderated)

Model Summary

	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.797[a]	.635	.623	2.12770

ANOVA

		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	982.334	4	245.584	54.247	.000[b]
	Residual	565.889	125	4.527		
	Total	1548.223	129			

Coefficients

		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	33.541	7.417		4.522	.000
	Material Management	.142	.0129	.069	11.040	.001
	Outbound Logistics	.131	.0140	.113	9.340	.002
	Operations Management	.754	.110	.444	6.869	.000
	Inbound Logistics	.981	.0183	.571	5.356	.000

Predictors: (Constant), Material Management, Outbound Logistics, Operations Management, and Inbound Logistics

b. Dependent: Performance of Food and Beverage Manufacturing Companies

4.12.2 Multiple Linear Regression Analysis (Moderated)

The study tested the moderating effect of technological integration on the relationship between value chain management practices and the performance of food and beverage manufacturing firms in Kenya. Using the model as follows;

$$\mathbf{Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5Z_5 + \varepsilon.}$$

The condition $R^2 2 > R^2 1$ and the differences in R squared being 0.003 due to the difference between $R2^2=0.637$ and $R2^1=0.635$ in Table 4.24 indicate that the alternative hypothesis is supported. This suggests that technology integration has a significant and positive moderating effect on the relationship between value chain management practices and the performance of food and beverage manufacturing firms. The beta coefficient of the interacting variable was significant, PV=0.0011<0.05, demonstrating that technological integration significantly contributes to value chain management practices to enhance the performance of food and beverage manufacturing firms in Kenya.

Table 4.24: Multiple Linear Regression Analysis (Moderated)

Overall Model Summary

	R	R Square	Adjusted R Square	Std. Error of the Estimate	Sig
2	.798[a]	.637	.628	2.13462	0.000

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
2	Regression	983.205	5	196.641	43.155	.000[b]
	Residual	565.018	124	4.557		
	Total	1548.223	129			

Coefficients

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
2	(Constant)	33.867	7.478		4.529	.000
	Material Management	.140	.0129	.128	10.860	.001
	Outbound Logistics	.114	.0146	.099	7.831	.003
	Operations Management	.752	.110	.443	6.818	.000
	Inbound Logistics	.994	.186	.578	5.346	.000
	Value chain Management practices* Tech integration	.0083	.0019	.031	4.370	.0011

a. Predictors: (Constant), Material Management, Outbound Logistics, Operations Management and Inbound Logistics

b. Predictors: (Constant), Material Management, Outbound Logistics, Operations Management and Inbound Logistics, Value chain Management practices* Technological Integration

c. Dependent: Performance of Food and Beverage Manufacturing Companies.

4.13 Optimal Model

The study examined the moderating effect of technology integration on the relationship between value chain management practices and the performance of food and beverage manufacturing firms in Kenya. Multiple regression models were used to test the fifth hypothesis, which stated that technology integration had no significant moderating effect on the relationship between value chain management practices and the performance of food and beverage manufacturing firms in Kenya. The regression equation is expressed as;

$$\mathbf{Y= \beta_0+ \beta_1X_1+\beta_2X_2+ \beta_3X_3+ \beta_4X_4+ \beta_5Z_+e}$$

$$\mathbf{Y= 33.541 + 0.981X_1+ 0.754X_2 + 0.142X_3 + 0.131X_4 + (Unmoderated)}$$

$$\mathbf{Y =33.867+ 0.994\ X_1 + 0.752\ X_2+0.140X_3 + 0.114X_4 + 0.\ 0083Z_+ (Moderated)}$$

Where ;

$\mathbf{X_1}$ -Inbound logistics

$\mathbf{X_2}$ -Operations Management

$\mathbf{X_3}$ -Material Management

$\mathbf{X_4}$ -Outbound Logistics

Z – Technological integration

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the study's summary, conclusion, and recommendations, as per the study hypothesis. The main focus of this study was to establish the relationship between value chain management practices and the performance of food and beverage manufacturing firms in Kenya.

5.2 Summary of Findings

The study provides a summary of findings based on the specific objectives of the research. The study was guided by the following specific objectives: to determine the relationship between material management and the performance of food and beverage manufacturing firms in Kenya, to establish how outbound logistics relates to the performance of food and beverage manufacturing firms in Kenya, to assess the relationships between operations management on the performance of food and beverage manufacturing firms in Kenya, to establish the relationship between inbound logistics and the performance of food and beverage manufacturing firms in Kenya, to assess the moderating effect of Technological Integration and the relationship between value chain practices and the performance of food and beverage manufacturing firms in Kenya

5.2.1 Material Management

The study's first objective was to determine the relationship between material management and the performance of food and beverage manufacturing firms in Kenya. The study revealed there exists a strong, significant, and positive correlation between material management and performance as measured through market share, profitability, and sale performance of food and beverage manufacturing firms in Kenya. For every change in the performance of food and beverage manufacturing firms,8.3% is attributable to material with a gradient material management of 0.592 in the curve. The findings asserted that value chain capabilities, strategic sourcing,

and material planning predict a significant increase in net profit margin, increase in return on assets, and increase in operation profit margin in food and beverage manufacturing firms in Kenya. The findings asserted that value chain capabilities, strategic sourcing, and material planning predict significant increases in sales volumes, sales revenues, customer lifetime value, and customer retention in food and beverage manufacturing firms in Kenya. The study established that technological integration enhances material management, increasing market share, profitability, and sales performance in food and beverage manufacturing firms in Kenya.

The respondents agreed that their organization has a formal strategic sourcing process to identify and select suppliers. They further agreed that supplier performance evaluations are conducted regularly to ensure compliance with established standards. Respondents also agreed that they actively seek to develop long-term relationships with key suppliers to enhance collaboration and value creation.

Regarding material requirement planning, the respondents agreed that the system ensures that material is available for production and products are available for delivery to customers. The respondents also agreed that improving material flow, shortening lead times, and reducing stocks increase efficiency in the whole operating range. Further, it was found that organizations simulate complex material flows for modelling and verification purposes.

5.2.2 Outbound Logistics

The study's second objective was to establish the relationship between outbound logistics and the performance of food and beverage manufacturing firms in Kenya. The study established a strong, significant, and positive correlation between outbound logistics and the performance of food and beverage manufacturing firms in Kenya. Correlation results affirmed that outbound logistics, order processing, dispatching, and packaging predict a significant increase in net profit margin, increase in return on assets, and increase in operation profit margin in food and beverage manufacturing firms in Kenya. Also, outbound logistics activities through order processing, dispatching, and packaging predict a significant increase in sales

volumes, sales revenues, customer lifetime value, and customer retention in food and beverage manufacturing firms in Kenya. For every change in the performance of food and beverage manufacturing firms,42% is attributable to outbound logistics with a gradient of 0.750 in the curve. Through regression results, the study affirmed that technological integration boosts outbound logistics, contributing to the achievement of expected performance as indicated by market share, profitability, and sale performance in food and beverage manufacturing firms in Kenya.

From the results, the respondents agreed that their company has an order processing system to capture order data from customer service employees or customers directly. In addition, they agreed that they use an order processing system to store the data in a central database and send order information to the accounting departments. Further, the respondents agreed that their company has carriers who fulfill the process of handling the goods to the customers' specified locations

Regarding dispatching, the respondents agreed that their dispatch system ensures the timely delivery of goods/services. In addition, the respondents agreed that dispatched items reach their destination within the expected timeframe. Further, the respondents agreed that the dispatch process is streamlined and minimizes delays. The study also revealed that the outbound logistics systems that the firms have embraced have provided advanced visibility and a broader overview of shipment distribution. The respondents also agreed that their company uses logistics data to support the marketing team in planning digital marketing and advertising campaigns. Regarding packaging, the respondents agreed that the outbound logistics systems that their company has embraced have provided advanced visibility and a broader overview of shipment distribution. They also agreed that their company uses logistics data to support the marketing team in planning digital marketing and advertising campaigns.

5.2.3 Operations Management

The third objective of the study was to evaluate the relationship between operations management and the performance of food and beverage manufacturing firms in Kenya. The study established a strong, significant, and positive correlation between operations management and the performance of food and beverage manufacturing

firms in Kenya. From the regression analysis, for every change in operation management, there is a 0.111 change in the performance of food and beverage manufacturing firms in Kenya. The study asserted that operations management activities process optimization, production scheduling, and capacity planning significantly and positively predict significant increases in net market share, profit margin, increase in return on assets increase in operation profit margin and increase in sale performance for food and beverage manufacturing firms in Kenya. The study found that operations management has a positive and significant influence and the performance of food and beverage manufacturing firms in Kenya. For every change in the performance of food and beverage manufacturing firms,48.7% is attributable to operations management with a gradient of 0.111 in the curve. From the results, the respondents agreed that the efficiency of their production processes enables us to minimize waste and maximize resource utilization. In addition, the respondents agreed that they effectively manage inventory levels to ensure a continuous supply of raw materials for production. Further, the respondents agreed that their quality control measures effectively ensure that our food products meet regulatory standards and customer expectations.

Regarding production scheduling, the respondents agreed that they integrate technology and automation into our operations to improve efficiency and productivity. Further, the respondents agreed that supplier collaboration ensures a reliable and cost-effective supply chain for raw materials and ingredients. Further, the respondents agreed that they monitor and optimize the performance of our production lines to achieve maximum output and minimize downtime. The respondents further indicated that their organization has a formal capacity planning process to ensure adequate production capabilities. In addition, it was revealed that manufacturing firms consider both short-term and long-term demand forecasts when determining production capacity. The respondents also agreed that cross-functional collaboration is key in their capacity planning process, involving production, sales, and supply chain teams

5.2.4 Inbound Logistics

The fourth objective of the study was to establish the relationship between inbound logistics and the performance of food and beverage manufacturing firms in Kenya. The study also revealed a strong, significant, and positive correlation between inbound logistics activities and the performance of food and beverage manufacturing firms in Kenya. The findings affirmed that inbound logistics through receiving, storage, and inventory control predict a significant increase in profitability, market share and sales volumes, sales revenues and customer lifetime value, and customer retention in food and beverage manufacturing firms in Kenya. For every change in the performance of food and beverage manufacturing firms,42.4% is attributable to inbound logistics with a gradient of 0.121 in the curve. Regression results confirmed that introducing technological integration in inbound logistics contributed to a significant and positive increase in market share, profitability, and sale volume in the performance of food and beverage manufacturing firms in Kenya. The study found that inbound logistics has a positive and significant influence and the performance of food and beverage manufacturing firms in Kenya. From the results, the respondents agreed that their organization has well-defined processes for receiving raw materials and ingredients from suppliers. In addition, the respondents agreed that they prioritize efficient unloading, inspection, and documentation of incoming shipments. Further, it was found that cross-functional teams are involved in the receiving process to ensure accuracy and quality.

From the results, the respondents revealed that proper storage conditions for raw materials and ingredients are maintained to ensure product integrity. In addition, the respondents agreed that their organization implements a first-in-first-out (FIFO) or a first-expiry-first-out (FEFO) inventory control system. Further, it was found that they actively monitor the shelf life and expiration dates of incoming materials to prevent stockouts and waste. Concerning inventory control, the respondents agreed that their organization maintains accurate and up-to-date inventory records using technology systems. Further, the respondents agreed they regularly conduct physical inventory counts to reconcile system records with actual stock. The respondents also agreed

that they had experienced reduced stockouts and improved on-time production due to efficient inventory control.

5.2.5 Technological Integration

The fifth objective of the study was to assess the moderating effect of Technological integration and the relationship between value chain practices and the performance of food and beverage manufacturing firms in Kenya. After introducing technological integration, the regression results revealed that operations management had a significant and positive relationship with the performance of food and beverage manufacturing firms in Kenya. The finding demonstrates that integrating technology in operations management would increase the performance of food and beverage manufacturing firms in Kenya. Upon introduction of technological integration, for every change in the performance of food and beverage manufacturing firms, 62.8% is attributable to value chain management practices with a gradient of 0.0083 in the curve. This further demonstrated that integrating technology in operations management, order processing, dispatching, and packaging increases the performance of food and beverage manufacturing firms in Kenya.

The results showed that the respondents agree that their organization invests in upgrading and maintaining technological infrastructure to support manufacturing operations. They also actively seek innovative technologies to improve production efficiency and product quality. The respondents also agreed that their organization updates and improves its technology and systems to ensure they are the latest and most efficient.

From the results, the respondents agreed that their organization had adequate employees with technical skills. The findings further showed that regular training is done on employees to equip them with technical skills. Also, findings revealed that they are satisfied with the effectiveness of technical capacity in their organization. Findings revealed that Automation is a key aspect of our manufacturing processes, helping us achieve higher levels of consistency and precision. The respondents agreed that they have embraced technology to ensure effective and efficient customer

relations management. The respondents indicated that their organization utilizes technology to monitor equipment performance and conduct predictive maintenance.

5.3 Conclusions

The study concluded a substantial, significant, and positive correlation exists between material management and performance as measured through market share, profitability, and sale performance of food and beverage manufacturing firms in Kenya. In conclusion, value chain capabilities, strategic sourcing, and material planning predict a significant increase in net profit margin, return on assets, and operation profit margin in Kenya's food and beverage manufacturing firms. The findings asserted that value chain capabilities, strategic sourcing, and material planning predict significant increases in sales volumes, sales revenues, customer lifetime value, and customer retention in food and beverage manufacturing firms in Kenya. The study established that technological integration enhances material management, increasing market share, profitability, and sales performance in food and beverage manufacturing firms in Kenya, which has contributed to improving performance and gaining competitive advantages.

The study concluded a strong, positive, and significant correlation exists between outbound logistics and the performance of food and beverage manufacturing firms. Outbound logistics is a strong predictor of performance as measured using market share, profitability, and sales volume in the performance of food and beverage manufacturing firms in Kenya. Outbound logistics such as outsourcing correlate to performance as companies reported increased sales volumes, increased customer base, and improved company profitability.

The study concluded that operations management and performance of food and beverage manufacturing firms in Kenya. The findings predict a strong, positive, and significant relationship between operations management and the performance of food and beverage manufacturing firms in Kenya. The findings implied that operations management would contribute significantly to achieving performance as measured using market share, profitability, and sales volume in the performance of food and beverage manufacturing firms in Kenya. The study concluded that order processing

time/speed, work scheduling, staff scheduling, responsiveness, on-time delivery, quality control, maintenance, resource capacity planning, just-in-time, and procurement purchasing are highly implemented operations management activities and a company's performance.

The study also concluded a strong, significant, and positive correlation exists between inbound logistics and the performance of food and beverage manufacturing firms in Kenya. The results affirm a strong, positive, and significant relationship between inbound logistics and the performance of food and beverage manufacturing firms in Kenya. Inbound logistics, receiving of goods, storage capacity, and inventory control contribute significantly to return on asset, reduction in cost of operations, and improved productivity. Inbound logistics would contribute significantly to performance as measured using market share, profitability, and sales volume in the performance of food and beverage manufacturing firms in Kenya.

The fifth research hypothesis tested was that 'Technological integration has no moderating effect on the relationship between value chain practices and performance of food and beverage manufacturing firms in Kenya. The study concluded that technological integration in value chain management practices contributes to performance in food and beverage manufacturing firms. Technological integration in value chain management practices would contribute to performance in manufacturing firms. The study concluded that food and beverage manufacturing firms adopt innovative technologies to improve production efficiency and product quality, update and improve their technological systems, foster value chain management, and achieve performance.

The study concluded that introducing technological integration in value chain management activities enhances the performance of food and beverage manufacturing firms. This conclusion is supported by the results that adequate employees with technical skills, regular training on employees to equip them with technological skills, effectiveness in manufacturing processes due to technological capacity, technological change, and IT infrastructure positively and significantly impact the organization's productivity companies in Kenya

5.4 Recommendations

Based on the findings and conclusions, the study provides the following recommendations to food and beverage manufacturing firms, policymakers, scholars, and academicians. The study established that technological integration enhances value chain management activities, enabling high-performance achievements in Kenya food and beverage manufacturing firms. Management in the manufacturing sector, particularly in the food and beverages industry, should prioritize technological integration to improve operational efficiency, profitability, and competitiveness.

The execution of material management, outbound logistics, operations management, and inbound logistics ensures the firm achieves the expected performance of food and beverage firms in Kenya. This was asserted by the results that demonstrated that technological integration enhances material management, contributing to the achievement of expected performance as indicated by market share, profitability, and sale volume in the performance of food and beverage manufacturing firms in Kenya. The management in manufacturing should embrace the findings of the study as it provided insight into the impact of the integration of technology in strategic sourcing, supply chain capability, and material requirement planning, increasing the performance of food and beverage manufacturing firms in Kenya.

The technological capability would significantly and positively foster manufacturing performance and help understand the influences of differences in firm size and industry characteristics. To achieve a considerable market share, the management of manufacturing companies should invest in integrating technology in outbound logistics, contributing to the achievement of expected performance in food and beverage manufacturing firms in Kenya.

The impact of technology adoption on organizational productivity, technological change, and IT infrastructure positively and significantly impacts the organization's productivity. At the same time, IT knowledge management has a significant but negative impact on organizational performance; top management in the manufacturing sector should be committed to supporting the application of

technology in value chain management, especially operations management. Introducing IT in product or process innovations significantly positively affects manufacturing firms' productivity. The study's findings have demonstrated that integrating technology in operations management, order processing, dispatching, and packaging increases market share, profitability, and sale volume in the performance of food and beverage manufacturing firms in Kenya.

Based on the findings of this study, it is recommended that manufacturing firms in Kenya should invest in advanced inventory management systems and software that can help them track and manage inventory levels in real time. This can prevent overstocking or understocking raw materials and finished products, ensuring a smoother production process. In addition, the firms should strengthen their relationships with suppliers. They should collaborate closely with suppliers to establish reliable and efficient supply chains. Negotiate favorable terms, monitor quality, and ensure timely deliveries of raw materials.

Manufacturing firms should develop a more efficient distribution network to ensure timely and cost-effective delivery of products to customers. The firms should utilize route planning software to determine the most efficient delivery routes, minimizing travel time and fuel consumption. This reduces transportation costs and improves delivery speed. In addition, the firms should evaluate whether a centralized or decentralized distribution model is more appropriate for their business. Centralized distribution centers can offer economies of scale, while decentralized centers may reduce transportation distances and improve responsiveness.

Manufacturing firms should reduce excess inventory by implementing just-in-time (JIT) inventory systems. This minimizes carrying costs, reduces the risk of waste due to product expiration, and optimizes working capital. In addition, the firms should develop standardized work procedures and ensure that all employees follow these procedures rigorously. This would lead to consistent product quality and efficient production processes

The study found that inbound logistics has a positive and significant influence and the performance of food and beverage manufacturing firms in Kenya. Therefore, this

study recommends that manufacturing firms establish strong and collaborative relationships with multiple suppliers. This approach provides a safety net in case of disruptions, enhances negotiation power, and creates opportunities for cost reduction and quality improvement. In addition, firms should ensure that the warehouse facilities are strategically located to minimize transportation costs and reduce lead times. Implementation of advanced warehouse management systems to streamline operations, minimize errors, and enhance the speed at which materials are received and stored.

The study found that technological integration has a positive and significant moderating effect on the relationship between value chain practices and the performance of food and beverage manufacturing firms in Kenya. Technological integration has been found to play a critical role in managing value chain activities in Kenya's food and beverage manufacturing sub-sector. It has been found to foster innovative performance and production efficiency and contribute to producing quality products.

It has been demonstrated that with technological integration in managing the value chain, food and beverage manufacturing firms overcome uncertainties and disruptions and achieve better performance. Despite the majority of the food and beverage firms adopting technology in managing value chain activities and its significant contribution to enhancing value chain management, numerous companies are reporting a decline in market share, a decline in profitability, and low sale volumes. This raises a critical need to develop a policy framework to support external knowledge and capacity to foster innovativeness in value chain activities.

This would, together with developed technology infrastructure, automation of value chain operations, and technical capacity, influence the achievement of superior performance in food and beverage firms in Kenya. This includes implementing advanced software solutions for supply chain management, production processes, and quality control. By embracing automation, data analytics, and the Internet of Things (IoT), the firms streamlined their operations, reduced errors, and enhanced overall efficiency.

5.5Areas for Further Studies

Based on the findings and limitations of the current study, several areas could be explored in further research. This study focused on food and beverage manufacturing firms in Kenya. Future studies could examine the impact of material management, outbound logistics, operations management, inbound logistics, and technological integration on the performance of firms in other sectors and regions. The current study focused on the immediate impact of the variables on the performance of food and beverage manufacturing firms in Kenya. Further research could investigate the long-term effect of these variables on firm performance and outcomes.

The study did not explore the mediating variables that could influence the relationship between the variables and firm performance. Future studies could examine the mediating variables affecting firm performance, such as organizational culture and structure. The study examined the moderating effect of Technological integration. Future studies could explore other moderating variables that affect firm performance, such as organizational culture

The study found that the independent variables (material management, outbound logistics, operations management, and inbound logistics) could only explain 63.4% of the performance of food and beverage manufacturing firms in Kenya. This study, therefore, suggests research on other value chain management practices not considered in the study on the performance of food and beverage manufacturing firms in Kenya.

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APPENDICES

Appendix I: JKUAT Research Letter

JOMO KENYATTA UNIVERSITY
OF
AGRICULTURE AND TECHNOLOGY

NAIROBI CBD CAMPUS
Department of Entrepreneurship and Procurement

P.O. Box 62000
NAIROBI – 00200
KENYA

TE: 0705950712
Email: epdncbd@jkuat.ac.ke

Ref: *JKU/6/3/17a*

Date: *18th July 2024*

TO WHOM IT MAY CONCERN

SUBJECT: MBUGUA ANNEVELYN NJOKI– HDE423- C004- 1334/2018

This is to introduce to you **Ms. Mbugua Annevelyn Njoki** who is a student pursuing her Doctor of Philosophy in Supply Chain Management at Jomo Kenyatta University of Agriculture and Technology, Nairobi CBD Campus. The student is currently undertaking research thesis entitled ***"Value Chain Management Practices and Performance of Food and Beverage Manufacturing Enterprises in Kenya"*** in partial fulfillment of the requirement for the degree program.

The purpose of this letter is to request you to give the student the necessary support and assistance to enable her obtain necessary data for the thesis. Please note that the information given is purely for academic purpose and will be treated with strict confidence.

Yours faithfully,

JKUAT NAIROBI CBD CAMPUS
www.jkuat.ac.ke
P.O. Box 62000 - 00200, NAIROBI
18 JUL 2024
ACOD, EPD DEPARTMENT

DR. SAMSON NYANG'AU (Ph.D)
AG. ASSOCIATE CHAIRPERSON, EPD

Appendix II: Questionnaire

Section A : Démographique information

1. For how long has your firm been in operation?

   0-15 years [ ] 16-30 years [ ]

   Above 30 years

2. **Indicate the ownership of the company**

   Local owned [ ]

   Foreign-owned [ ]

   Regional owned [ ]

Section B: Material Management.

Indicate the extent to which you agree or disagree with the following statements relating to the effect of material management and the performance of food and beverage manufacturing firms in Kenya. Use the scale 5-Strongly Agree, 4-Agree, 3-Moderate, 2-Disagree,1- strongly disagree)

Statements	**1**	**2**	**3**	**4**	**5**
Value Chain Capabilities					
Our organization has a well-defined supply chain strategy aligned with overall business goals					
We regularly assess and update our supplier selection criteria to ensure quality and reliability					
Our organization maintains clear communication channels with key suppliers for efficient information flow.					
Strategic Sourcing					
Our organization has a formal strategic sourcing process in place to identify and select suppliers					
Supplier performance evaluations are conducted regularly to ensure compliance with established standards					

Statements	1	2	3	4	5
We actively seek to develop long-term relationships with key suppliers to enhance collaboration and value creation					
Material Requirement Planning					
Material requirement planning system ensures material is available for production and products are available for delivery to customers					
The increasing efficiency in the whole operating range is achieved through improvements in material flow, shortened lead times, and reduced stocks					
Organizations simulate complex material flows for modeling and verification purposes					

What are some other ways in which material management affects the performance of food and beverage manufacturing firms in Kenya?

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……..

Suggests ways of improving material management to the benefit of food manufacturing firms

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Section C: Outbound Logistics

Indicate the extent to which you agree or disagree with the following statements relating to the effect of Outbound Logistics and the performance of food and beverage manufacturing firms in Kenya. Use the scale 5-Strongly Agree, 4-Agree, 3-Moderate, 2-Disagree,1- strongly disagree)

Statements	1	2	3	4	5
Order processing					
Our company has an order processing system to capture order data from customer service employees or customers directly					
We use an order processing system to store the data in a central database and send order information to the accounting departments					
Our company has carriers who fulfill the process of handling the goods to the customers' specified locations					
Dispatch					
Our dispatch system ensures the timely delivery of goods/services.					
Dispatched items reach their destination within the expected timeframe.					
The dispatch process is streamlined and minimizes delays.					
Packaging					
The outbound logistics systems that our company has embraced have provided advanced visibility and a broader overview of shipment distribution					
Our company uses logistics data to support the marketing team in planning digital marketing and advertising campaigns					

What are some other ways in which outbound logistics affect the performance of food and beverage manufacturing firms in Kenya?

……

……..……

……..

Suggests ways of improving outbound logistics to the benefit of food manufacturing firms

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……..……

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Section D: Operations Management

Indicate the extent to which you agree or disagree with the following statements relating to the effect of operations management and the performance of food and beverage manufacturing firms in Kenya. Use the scale 5-Strongly Agree, 4-Agree, 3-Moderate, 2-Disagree,1- strongly disagree)

Statements	**1**	**2**	**3**	**4**	**5**
Process Optimization					
The efficiency of our production processes enables us to minimize waste and maximize resource utilization.					
We effectively manage inventory levels to ensure a continuous supply of raw materials for production.					
Our quality control measures effectively ensure that our food products meet regulatory standards and customer expectations.					
Production Scheduling					
We integrate technology and automation into our operations to improve efficiency and productivity.					
Our collaboration with suppliers ensures a reliable and cost-effective supply chain for raw materials and ingredients.					
We monitor and optimize the performance of our production lines to achieve maximum output and minimize downtime.					
Capacity Planning					
Our organization has a formal capacity planning process to ensure adequate production capabilities					
We consider both short-term and long-term demand forecasts when determining production capacity					
Cross-functional collaboration is key in our capacity planning process, involving production, sales, and supply chain teams					

What are some other ways in which operations management affect performance of food and beverage manufacturing firms in Kenya?

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……..……
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Suggests ways of improving operations management to the benefit of food manufacturing firms

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Section E: Inbound Logistics

Indicate the extent to which you agree or disagree with the following statements relating to the effect of the inbound logistics performance of food and beverage manufacturing firms in Kenya. Use the scale 5-Strongly Agree, 4-Agree, 3-Moderate, 2-Disagree,1- strongly disagree)

Statements	**1**	**2**	**3**	**4**	**5**
Receiving					
Our organization has well-defined processes for receiving raw materials and ingredients from suppliers.					
We prioritize efficient unloading, inspection, and documentation of incoming shipments.					
Cross-functional teams are involved in the receiving process to ensure accuracy and quality.					
Storage					
Proper storage conditions for raw materials and ingredients are maintained to ensure product integrity.					

Statements	1	2	3	4	5
Our organization implements a first-in-first-out (FIFO) or a first-expiry-first-out (FEFO) inventory control system.					
We actively monitor the shelf life and expiration dates of incoming materials to prevent stockouts and waste					
Inventory control					
Our organization maintains accurate and up-to-date inventory records using technology systems.					
We regularly conduct physical inventory counts to reconcile system records with actual stock					
We have experienced reduced stockouts and improved on-time production due to efficient inventory control.					

What are some other ways in which inbound logistics affect the performance of food and beverage manufacturing firms in Kenya?

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Suggests ways of improving inbound logistics to the benefit of food manufacturing firms

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Section F: Technological integration

Indicate the extent to which you agree or disagree with the following statements relating to the moderating effect of Technological integration on the relationship between value chain practices and the performance of food and beverage manufacturing firms in Kenya. Use the scale 5-Strongly Agree, 4-Agree, 3-Moderate, 2-Disagree,1- strongly disagree)

Statements	**1**	**2**	**3**	**4**	**5**
Infrastructure					
Our organization invests in upgrading and maintaining technological infrastructure to support manufacturing operations.					
We actively seek out innovative technologies to improve production efficiency and product quality.					
Our organization updates and improves its technology and systems to ensure they are the latest and most efficient					
Technical Capacity					
Our organization had adequate employees with technical skills					
Regular training is done on employees to equip them with technical skills					
I am satisfied with the effectiveness of technical capacity in our organization					
Automation of Operations					
Automation is a key aspect of our manufacturing processes, helping us achieve higher levels of consistency and precision.					
We have embraced the use of technology in ensuring effective and efficient customer relations management					
Our organization utilizes technology to monitor equipment performance and conduct predictive maintenance					

What are some other ways in which technology management affects the performance of food and beverage manufacturing firms in Kenya?

……

Suggests ways of improving technology management to the benefit of food manufacturing firms

……..……

……..……

Section G: Performance of Food and Beverage Manufacturing Firms in Kenya

	2019	2020	2021	2022	2023
Market Share					
Profitability					
Sale Volume					

Performance

Indicate the extent to which you agree or disagree with the following statements relating to the company achieving the following performance indicator of food manufacturing firms in Kenya. Use the scale 5-Strongly Agree, 4-Agree, 3-Moderate, 2-Disagree,1- strongly disagree)

Statements	**1**	**2**	**3**	**4**	**5**
The Organisation reported an increase in the number of branches					
The Organisation has an increase in the number of customers					
We have a popular and steady growth in the market					
Regularly, we have an increase in operational profit margin					
There is an increase in return on investment (ROI) in the organization					
The Organisation reported a yield in gross profit margin					
The number of sales reported in the organization improved steadily					
There is an increase in sales revenue in the organization					
The Company reported an increase in customer lifetime value (LTV)					

THANK YOU FOR PARTICIPATING

Appendix III: List of Food and Beverage Manufacturing Firms in Kenya

S/ No.	Name	Telephone	Email	Location
1.	Acee Limited	+254721275480/ +254734888111	bija@aceelimited.co.ke jinal@aceelimited.co.ke	Godown No B10 Graylands Business
2.	Afribon (K) Limited		contact@afribon.com	43 Apple Cross Road, Lovington
3.	African Coffee Roasters (EPZ) Limited	+254721116477	info@acr.co.ke accounts@acr.co.ke	Twiga Crescent, Off Simba Road
4.	Afrimac Nut Company	+254(020)233855 7/8	info@afrimac.co.ke	15thShivachi Road Parklands
5.	Agri pro-Pak Ltd	+254773422670 +254770772346	sudhir@fruit-dale.com info@fruits-dale.com	Muguga Along Nairobi-Naivasha Highway
6.	Agriscope (Africa) Limited	+254(020)652101-4 +254722207747 +254734333161	info@easeed.com	G.P.O Dakar Road Industrial Area, Nairobi
7.	Agrochemical & Food Co.	+254(020)233402 0/1 +254722205447/8	admin@acfc.co.ke marketing@acf.co.ke	Go down Nyithindo Location Oregon 18
8.	Al- Noor Feisal & Co Ltd	+254722524876	montychai@gmail.com	Nairobi
9.	Alicia Bakers & Confectioners Limited	+254727342873 +254727480589	info@lakelandloaf.com	Usenge-OsiekeRoad, Opposite Got Agulu Hospital
11.	Al-Mahra Industries Ltd	+254786588288 +254712588288	AlmahraindLtd@yahoo.com	Nairobi
12.	Al-Mahra Industries Ltd	254786588288 +254712588288	AlmahraindLtd@yahoo.com	Nairobi
13.	Almasi beverage's	+254709903000	info@almasibeverages.co.ke	4th Floor Delta Corner, Choro
14.	Alpine Coolers Ltd	+254(020)353430 0/1/2 +254722739853	info@Aalphineone.com	Ectoville Estate, Road A' Off firms Road
15.	Amki Kenya Limited	+254721447843 +254702442606	amkikenyaltd@gmail.com	Off North Airport Road

16.	Ankole Grill Limited	+254710202020	admin@ankole.co.ke grace@ankole.co.ke	Kilimanisenteni Plaza ground floor
17.	APT Commodities Ltd	+254790009040	peter@appteas.com	Nkrumah Road, Mombasa
18.	Aquamist Limited	+254710850850 +254(020)4447244/4113	info@aquamistwater.com	Sigona Off Nairobi-Nakuru Highway
19.	Arax Mills Ltd	+254722701139	araxmills@yahoo.com	Nanyuki Road. Nairobi
20.	Azaavi Collections	+254722278205	info@azaavifoods.com	Nyayo Embakasi
21.	Bakemark Ltd	+254733788318	info@bakemark.co.ke	LungaLungaRoad, Opp Shell Petrol Station
22.	Bakers Corner Ltd	+254700049811 +254(020)2323453	Bakerscorner2011@yahoo.com	Kings Go-Down (No.5) Road C Off firms Rd
23.	Bakex Millers Ltd	+254731459868 +254717080024	info@bakex.co.ke	Thika-Garissa Road Off Garissa Road
24.	Baraka Bakers Limited	+254751218088 +254770793189	bbltd@gmail.com	Kenya Industrial Estates Opposite Soni Technical
25.	Bdelo Ltd	+254705154157 +2547070311140	info@bdelo.com	Hiwi Court, Gr Flr, Ngong Rd
26.	Beecare Apiaries International Limited	+254726349853	info@beecareapiaries.com	Garissa Road Weema Stage
27.	Beta Bakers Limited	+254791938865	info@betabakers.co.ke	Matuu Town
28.	Belfast Millers Ltd	+254 735100499	info@belmill.com	BamburiRoad Industrial Area
29.	Bidco Africa Ltd	+254(067)2821000 +254733655777	happyhealthliving@bidco-oil.com exports@bidcorafrica.com	General KagoRoad, Off Garissa Rd.
30.	Bidco Africa Limited	+254722278777 +254733365577	customercare@bidcoroafrica.com	Bidco Industrial Park Kiambu Road
31.	Bio Food Products Ltd	+254(020)3503595/6/7/8 +254722203081	info@biofoods.co.ke	Road C, Off firms Road

32.	BlocfirmsLtd	+254(020)2603837	bloc firms s@gmail.com	Veteran House Ground Floor
33.	Blue Plastics and Water Co. Ltd	+254722464528 +254720760997	Info.blueplastics@gmail.com	Kyangombe, Off Mombasa Road
34.	Bravo Food Industries Ltd	+254727600200 +524715641326	inf@bravofood.co.ke	Lukenya Athi River, Machakos County
35.	Britania Food Limited	+254(020)6533861	admin@britania.co, ke	Kampala Road, Industrial Area
37.	Broadway Bakery Ltd	+2544(020)3596210/1 +254720504309	broadways@africaonline.co.ke	Factory Road, Thika
38.	Brookside Dairy Ltd	+254722130000 +254(020)3542480/1/2	maziwa@broakside.co.ke	Ruiru, Kenya
39.	Buffalo Millers	+254 720953350	evanskilly@yahoo.com	Kisumu off peris Road
40.	Burton and Bamburi Limited	+254729828820	sweetunda@burtonandbamber.com	Thika
41.	Butali Sugar Mills Ltd	+524(020)2631169 +254771767676	info@butalissugar.co.ke	Butali Village Off Kakamega- Webuye Road
42.	C Dormans SEZ Limited	+254(067)5863000	sales@dormanscoffee.com	Tatu Industrial Park Ruiru
43.	C.Czarnikow Sugar (EA)Ltd	+254(020)2710312/314	jtaylor@czarnikw.com	I&M Bank House, 2nd Ngong Avenue
44.	Candy Kenya Ltd.	+254(020)557234 +254734630780	Sales@candykenya.com	Nyayo Stadium Off Mombasa Road
45.	Capel Food Ingridients	+254711045000 +254732167000	Info@capel.co.ke	Osho Complex plot No.11
46.	Capwell Industries Ltd	+254(020)2055422 +254736237000	admin@capwell.co.ke	Off Garissa Road, Thika
47.	CarojimCookery firms	+254725387149 +254788294803	caterinabakery@gmail.com	Kangema
48.	Centrofood Industries Ltd	+254700113104 +254(020)2051455	info@cfkenya.com	MaldeGodowns Kenyatta Highway

49.	Chai Trading Company Limited	+254(020)2048431 +254722203423	ctcmsa@miritini.ktdateas.com	KTDA Miritini Complex
50.	Coastal Bottlers Ltd	+254(041)2000198 +254729403692	coke.msa@coastalbottlers.co.ke	Mombasa- Malindi Road
51.	Coca-Cola Central East and West Africa Ltd	+254(020)3253000 +254734109260	ewaita@coca-cola.com	The Coca-Cola Plaza Kilimani
52.	Coff Tea Agencies	+254(041)2227584 +254(020)2039632	mombasa@cOfftea.net	MwinyiMpate Street Off Voi Street
53.	Confini Ltd	+254718263390	sales@confiniLtd.com	Baba Dogo Road Ruaraka
54.	Convex Commodity Merchants Limited	+254707288277	dkamau@convexcommodity.co.ke	Convex HQ Kirichwa Road Off Ngong Road
55.	Cornbelt Flour Mill	+254796397888	pmucuna@gmail.com	Along Moisbridge Kitale Road
56.	Crofts Ltd	+254 702692129 +254734929711	info@croiftsLtd.com	Thika
57.	Crystal World Agencies Ltd	+254722862358	crystalworldagenciesltd@gmail.com	Ruaraka Baba Dogo
58.	Crywanfirmslimited	+254722260928 +254722819800	info@crywan.com	Athi River Business Park
59.	Danone Baby Nutrition Africa and Overseas	+254(020)4442149 +254725801546	info@danone.co.ke	Kenyrail Westlands Ring Rd
60.	Del Monte Kenya Ltd	+254 (067)21601 +254(067)24026/7/8/9	nanasi@freshdelmonte.com	Oloi Tip Road, Thika
61.	DevkanfirmsLimited	+254(020)2525600	Infobakerslandkenya.com	Off Baba Dogo Road Smiley Complex
62.	Devyani Foods Industries	+254(020)8016161	info@sall.co.ke	49Riverside Drive, Westlands

	(Kenya) Limited	+254-020-2385757		
63.	Deylin Ultimate Springs Ltd	+254727843054	Jasper.mbaka@gmail.com	Naivasha
64.	Diamond Industrial Ltd	+254773491600 +254724242009	info@dilpanga.com	Mwangeka Road, Mombasa
65.	DPL Festive Ltd	+254(020)2467474	admin@festivalbrands.co.ke	LungaLunga Road, Industrial Area
66.	Eagles Bread	+254724436309	csolomonkipruto@yahoo.com	Kapcherop
67.	East Africa Breweries Ltd	+254(020)8644000	Gabriel.kitenga@eablk.com	Tusker House, Off Thika Road
68.	East Africa Sea Food Ltd	+254711018000 +254722203156 +254736500001	seafood@alpakenya.com	Road A, Off firms Road
69.	Eastern Produce Kenya Ltd (Kakuzi)	+254722205342 +254733600931	info@lintopark.co.ke	3rd Floor New Rehema House
70.	Eco Living International Limited	+254717719213	e.migigo.bake@gmail.com	Trio Estate Gigiir off Limuru Road
71.	Edible Oil Products Ltd	+254710700638	info@nrb.mmm.co.ke	Road C Industrial Area Nairobi
72.	Eldoret Grains Ltd	+254(053)2032718/2032925	infoEldoretgrains.com	Behind Kipchoge Keino Stadium
73.	Elekea Ltd	+254(020)3740036	amisha@elekea.co.ke	Wambugu Close, Parklands
74.	Europack Industrial Limited	+254(020)2300038/39/40	europack@chemrawea.com	Nyahera Rd, Off LungaLunga RD
75.	Excel Chemicals Ltd	+254(020)8233306/7/9	suresh@excel.co.ke	Old Mombasa Road, Embakasi
76.	Farmers Choice Ltd	+254722331706	sausages@farmerschoice.co.ke	Kahawa West, Off Kamiti Road
77.	Frigoken Ltd	+254721383551	Frogoken@frigoken.com	Baba Dogo Road, Ruaraka, Nairobi
78.	FRM EA Parkers Ltd	+254721614898	frmpackers@gmail.com	Mlolongo, Emerald Business Park
79.	Giloil Company Ltd	+254721406421	Gillgroupnbi.ispkenya.com	ViwandaniGilgil Road, Nairobi
80.	Githunguri Dairy Farmers	+254707141414	freshdairy@fresha.co.ke	Githunguri, Along Kiambu Road

	Co-operative Society			
81.	Glacier Food Industries Ltd	+254748611110	rox@glacier.co.ke	Solian 3 Road, Msa-mid Mtwapa
82.	Glacier products Ltd	+254722202089	dipam@dairyland.co.ke	Road A, Off firms Road, Industrial Area
83.	Global Mark Foods Limited	+254700095337	globalmarkfoods@gmail.com	Abacus Park Baba Dogo Road Nairobi
84.	Global Tea& Commodities(K) Ltd	+254(014)3404/05/21	mmail@globaltea.co.ke	Chai Street, High Level, Shima
85	Gold Crown beveragesLtd	+254(014)2223404 +254724257222	goldcrown@africaonline.co.ke	Chai Street, Shimanzi
86.	Gold Crown Foods (EPZ) Ltd	+254(014)2223404/5	goldcrown@africaonline.co.ke	Chao Street Shimanzi
87.	Golden Africa Kenya Ltd	+254732902908	omar@gakl.co.ke	Lukenya Mombasa Highway, Kitengela
88.	Gonas Best Ltd	+254716431077	gonabest@yahoo.com	Off Lusinget Road, Next to Kenya Industrial Estate (KIE Industrial Area)
89.	Grain Industries Ltd	+2547208100999	Mnr.thabit@gmail.com	Beira Street Mozambique Road
90.	Grainnuts Craft Limited	+254722412664	info@grainutscraft.com	Munyu Near Githimu Shopping Center
91.	Green Forest Foods Ltd	+254722704823	info@greenforest.co.ke	EmayianGodownsGodown No. 9
92.	Halisi Maize Millers Ltd	+254737411568	halisimaizemills@gmail.com	Mombasa
93.	Happy Cow Ltd	+254727352101	info@happycowkenya.com	Along Nakuru Highway
94.	Health U Two Thousand Ltd	+254752799499	info@healthy-u2000.com	Park Abacus Lane, Babadogo Road
95.	Hephzibah International Limited	+254722954013	info@hephzibahinternational.co.ke	Buru Road Phase 2
96.	Heritage Foods Kenya Ltd	+254701200362	Info2heritagefoods.co.ke	Ambassador Godown No 3 Athi River
97.	Highlands Mineral Water Company Ltd	+254721931057	highlands@highlandsske.com	HMWCL Building Ihururu Road Nyeri
98.	Honey Care Africa	+254735574448	info@honeycareafrica.com	Muringa Avenue, Jamuhuri Park
99.	Hope Tasty	+254722362789	Tastybread2021@gmail.	Nairobi

	Cake Baker Limited		com	
100.	Isinya Feeds Ltd	+254711473592	info@isinyafeeds.co.ke	Athi River, Off Mombasa Road
101.	Italian Gelati &Food Products Ltd	+254733902799	Italian.gelati@gmail.com	TaibAdbulla Nasir Road, Liwatoni
102	James Finlay Kenya Ltd	+254705572073	info@finalys.co.ke	Kericho JFK Inlet Road
103.	Jetlak Foods Ltd	+254722754181	admin@jetlak.com	Off Kiambu Road, Factory Road, Ruiru, Kenya
104.	Jiira Trading Ltd	+254721380953	adenshil@gmail.com	Jamia Plaza Banda Street
105	Jjasm Mini-Distillery	+254721848581	Jjasm.consult@gmail.com	Shanjetso Sub-location Kakamega
106	Jungle Group Holdings Ltd	+254720888456	Info@junglenuts.co.ke	Light Industries Makongeni, Thika
107.	Kabianga Dairy Ltd	+254722661555	carrier@swan.co.ke	Off Kericho-Sotik Road
108.	Kalabashi Investment Limited	+254722233888	kalabashilimited@gmail.com	Tangaza University College Business Center
109	Kalabashi Investment Limited	+2547222333888	kalabashilimited@gmail.com	Tangaza University College Business Center
110.	Kamarich Empowerment Tea Factory Limited	+254727464547	kamarich@sireetoep.co.ke	KapsabetKaptumo Road
111.	Kamili Packers Ltd	+254705065306	info@kamilipackers.com	Off firms Road Homabay Road
112.	Kappa Oil Refineries Ltd	+254722465172	info@kapa-oil.com	Main Mombasa Road, Nairobi
113.	Karirana Estate Ltd	+254714061924	info@karirana.co.ke	Limuru
114.	Kay Salt Ltd	+254721530102	info@kaysalt.com	KAY COMPLEX. Embakasi Mombasa, Nairobi
115.	Kenafric Bakery	+254733614530	kabl@kenfric.com	Along Nairobi Thika Super Highway
116.	Kenafric Industries Ltd	+254733631360	admin@kenafricind.com	Off Baba Dogo Road, Ruaraka
117.	Kenblest Ltd	+254721490800	info@kenblestgroup.com	Off Garissa Road Industrial Area, Thika
118	Kenblest	+254721490800	info@kenblestgroup.co	Off Garissa Road

.	Limited		m	Industrial Area, Thika
119 .	Kenblest Processors Limited	+254721490800	info@kenblestgroup.com	Off Garissa Road Industrial Area, Thika
120 .	Kenchic Ltd	+254722202163	info@kenchic.com	Exsan House Firms Road
121 .	Kentaste Products Limited	+254722848743	info@kenstate.com	Nairobi/Mombasa Highway
122 .	Kenya Highlands Seed Co. Ltd	+254725549997	info@khs.co.ke	Sanam Building, Road C offfirms Road Industrial Area.
123 .	Kenya Nut Company Ltd	+254(020)444812 3/448365/6	info@kenyanut.com	Volvo House Opp Barclays Plaza
124 .	Kenya Sweets Ltd	+254725575575	info@kenyasweets.com	Old Airport Road, Off Mombasa
125 .	Kenya Tea Development Agency	+254(020)222144/ 4	info@ktdateas.com	Farmers Building, Moi Avenue
126 .	Kenya Tea Packers Ltd (KETEPA)	+254726555554	info@ketepa.com	Kericho Municipality on Kericho
127 .	Kenya Wine Agencies Ltd	+254733637733	info@kwal.com	Firms Rd, Industrial Area
128 .	Kevian Kenya Ltd	+25473394483	info@keviankenya.com	Ngong Road, Opposite War Cemetery
129 .	Khetia Drapers Limited	+254733400071	info@khetia.com	KDL Business Park, Mumia HW
130 .	Kibos Dairy & Farm Produce	+254722267533	kibosdairyfarmproduce @gmail.com	Kisumu
131 .	Kibos Distillers Limited	+254736157777	headoffice@kibosugar.com	Kibos Road Near Kibos Prison
132	Kibos Sugar & Allied Industries	+254736157777	headoffice@kibosugar.com	Nehru Road- Milimani, Kisumu
133 .	Kigelia Fresh Produce Ltd	+254713093663	mary@kigeliagroup.com	580 Runda Meadows, Runda Estate
134 .	KijaniAgro Products Limited	+254783402220	kijanigropro@gmail.com	Nairobi
135 .	KIJatafirmsLimited	+254705257745	kijatasales@gmail.com	Shedi KIE Meru
136 .	Kilimanjaro Biscuits Ltd	+254780606031	kilimanjarobiscuits@gmail.com	Colfax Industrial Park, Bonje
137 .	Kina Loaf Bakery Ltd	+254720405189		Migori

138.	Kinangop Dairy Ltd	+254707561990/1	info@kinangopdairy.co.ke	Ndunyu Njeru
139.	Kirinyaga Flour Mills	+254731241212	Info.kfm@gmail.com	Tom Mboya Street, Lords House
140.	Kitui Flour Mills	+254(041)2496004/5	info@kituiflourmills.com	Mombasa
141.	Koba Waters Ltd	+254720946475	admin@broomhillsprings.com	2nd Floor, Mpaka House Westlands
142.	KrishCommodietis Ltd	+254720794178	krish@ikenya.com	Mashundu Street Shimanzi
143.	Kwale International Sugar Company Limited	+254729234567	info@kwale-group.com	Unifresh Building Baba Dogo, Nairobi
144.	L.A.B International Kenya Limited	+254733227989	trading@LABkenya.com	C Opposite Ufanisi Freighters K Ltd
145.	Lactacare Kenya limited	+254797555411	lactacarekenya@gmail.com	ArgwingsKodhek Road
146.	Lesere Kenya Limited	+254718881122	isaacyego@yahoo.com	Sun Plaza building Along Nakuru Eldoret Road
147.	Mace Foods Limited	+254720391290	macefoods@gmail.com	Kambi Somali Road oppditmann Construction
148.	Mafuko Industries Ltd	+254722872315	info@mafuko.com	Meru- Maua Road Kaaga Area, Meru
149.	Maisha Flour Mills Limited	+254722655211	Info@maisha.com	Plot 12875 Chaka Kiganjo, Off Nyeri-Nanyuki Highway
150.	Malachite Ltd	+254744888888	contactus@mayers.co.ke	Mayers Farm Mai Mahiu
151.	Mama millers Ltd	+254728095305	mamamillers@yahoo.com	Kakuzi, Road BAT Area
152.	Mamaz Spices Limited	+254700932801	rita@nggroup.co.ke	84 Riverside Drive
153.	Mamboleo Distillers Ltd	+254722167853	kenlabsuppliers@yahoo.com	MamboleoMiwani Road Kisumu
154.	Manji Food Industries Ltd	+254722203626	sales@dawda.net	Junction of Likoni and LungaLunga Road
155.	Marakiqana Limited	+254722209905	makeda@marakiqana.com	Muthithi Road Westlands Mitsumi Business Park 9th Floor
156.	Mars Wringley Confectionery Kenya	+254730998071	Infokenya@wrigley.com	Off Mombasa Road plot No. 1046/263 Athi River
157	Massatech	+2547256011/7/28	info@hibisco.co.ke	Nairobi

.	Kenya Limited	9/447		
158.	Max Grains Limited	+254721490800	info@maxgrains.com	Off Garissa Road Industrial Area Thika
159.	Mayfair Holdings Limited	+254773458850	ggm@sunblest.co.ke	Makasembo Road
160.	Mayfeeds Kenya Ltd	+254722740550	admin@mayfeeds.com	Thika Off Garissa
161.	Melvin Marsh International	+254733708627	sales@melvinstea.com	Funzi Road, Industrial Area
162.	Menengai Oil Refineries Ltd	+254774331698	info@menengaigroup.com	Nakuru Eldoret Highway
163.	MHS Bakers Limited	+254718111333	mhsbakerslimited@gmail.com	Unit II Kenbelt Business Park, Nairobi
164.	Midrow Kenya Ltd	+254722643847	Wilson.mwangi@midrowkenya.com	Kiserian
165.	Milly Fruit Processors Ltd	+254722572640	ca@millyfruits.com	Mombasa-Malindi Road
166.	Mini Bakeries (Nbi) Ltd	+254731999905/6	info@minibake.com	Kagundo Road, Off Outering Road
167.	Mjengo Ltd	+254(020)2055510/11	admin@mjengo.com	Off General Kago Road Behind B
168.	Mombasa Maize Millers	+254722273388	info@msa.mmm.co.ke	MMM Building, Mwangeka Street
169.	Morani Ltd	+254733621426	constarLtd@gmail.com	Plot No. 49, Kalalu Laikipia
170.	Mvita Oils Limited	+254740040034	admin@mvitooils.com	Kikambala
171.	Mwachaka Group Ltd	+254702153117	trulyorganicfoods@gmail.com	KalroMugugaCenter Physics Lab Room 65
172.	Mwakawa Investment	+254758025222	info@mavolonigranite.co.ke	Nairobi
173.	Mwananchi Bakery	+254718677685	info@mwananchibakery.co.ke	Leisure off Mombasa Malindi Road
174.	Mypasta Limited	+254722309984	krish@ikenya.com	Kikambala, Kilifi
175.	Mzuri Sweets Ltd	+254722674022	Info@mzurisweets.com	Along Mombasa-Malindi Road
176.	Nagaad Company Limited	+254110004051	info@nagaadgums.com	Ruai, Embakasi
177.	Nairobi Bottlers Ltd	+254(020)6998210	nairobibottlers@ke.ccsabco.com	Airport North Road Embakasi
178.	Nairobi Flour Mills Ltd	+2547275311000	nfm@jimbi.co.ke	Homa Bay Road, Industrial Area
179.	Nairobi Java House Ltd	+254703566842	admin@javahouseafrica.com	ABC Place Off WaiyakiWay Westlands
180	Nesfoods	+254722848090	info@nesfoodltd.com	Archbishop Macario

.	Industries Ltd			Road Block
181.	Nestle Foods Kenya Ltd	+254(020)3990312	Henry.kungu@ke.nestle.com	Pate Road, Industrial Area
182	Njoro Canning Factory (Kenya) Ltd	+254724253050	info@njorocanning.co.ke	Njoro, Nakuru- Mau Narok Road
183.	Norda Industries	+254732402786	faraz@norda.biz	Mombasa Road, Next to Renault
184.	OkerioNyngau Bakery	+254724901716	okeironyangau@gmail.com	Ukunda
185.	Olenguruone Natural Water Ltd	+254716054109	surloafcustomer@gmail.com	Olenguruone
186.	OlivadoEpz Limited	+254710535303	okl@olivado.com	Mirira/LOC 20/5419, Muranga
187.	Orchard Juice Ltd	+254728699965	pauline@orchardjuice.com	Junction Off Waiyaki Way
188.	Palmhouse Diaries Ltd	+2540722945236	eric@palmhousedairies.com	Moi Road Githunguri
189.	Patco Industries Ltd	+254733600796	patco@patcoindustriesLtd.com	LungaLunga Road Off Rangwe Road
190.	Patiala Distillers Ltd	+254715528540	sales@patialadistillerskenya.co.ke	Rongai Business Hub Rongai Town
191.	Pearly LLP	+254738935696	pearlyllp@outlook.com	Gideon Rimba Road Plot No. XIX
192.	Pembe Flour Mills Ltd	+254733880303	info@pembe.co.ke	LungaLunga Road Industrial Area Nairobi
193.	Peshwoodfirms Ltd	+254798947766	peter@peshwood.com	Nkurumah Road Mombasa
194.	Pradipfirms(E. A) Ltd	+254711045000	kunal@pei-ea.co.ke	Plot No. 11, Sasio Road Off LungaLunga Industrial Area
195.	Premier Food Industries Ltd	+254722440461	pfill@peptang.com	Baba Dogo Road, Ruaraka, Nairobi
196.	Pride Industries Ltd	+254722520920	info@pridedrinks.com	Along Mombasa Mid Highway Kika
197.	Promasidor Kenya Ltd	+254720600599	info@promasidor.co.ke	Athi River EPZ, Off Namanga Road
198.	Propack Kenya Ltd	254722235444	info@propack-kenya.com	Nairobi
199.	Pwani Oil Products Ltd	+2540722207886	info@pwani.net	Wahunzi Street, Mombasa
200.	Rafiki Millers Ltd	+254733515448	info@rafikimillers.com	Next to Inland Container Depot
201.	Ramm Millers Ltd	+254722232392	rammillers@gmail.com	KapsereMalel Farm Eldoret
202.	RAZCO Ltd	+254722786146	info@lyonsmaid.com	Baba Dogo Road Ruaraka

203.	Re-Suns Spices Ltd	+254732556067	Sach-shah@yahoo.com.au	Gil Road Industrial Area
204.	Royal Swiss Bakery Ltd	+254721227775	royalswissbakery@gmail.com	Ragwe Road, Nairobi
205.	Salim Wazarani Kenya Company Ltd	+254734412525	info@sawake.co.ke	Kampala Road
206.	Salwa Kenya Limited	+254703166166	info@salwa.co.ke	KikambalaBado off Road Kilifi
207.	Sasini PLC	+254733/0734200706	info@sasini.co.ke	Rivaan Centre, 3rd Floor Brookside Grove, Muguga Green Westlands
208.	Savannah Brands Company	+254715254718	alex@savannahbrandsco.com	Tilisi, Limuru
209.	SBC Kenya Ltd	+254703208277	sales@sbckenya.com	Nairobi
210.	Scrumptios Eats Ltd	+254713419092	info@scrumptioseats.co.ke	Westlands Commercial Center
211.	Selecta Kenya Gmbh& Co. KG	+254723872786	Info@selectakenya.com	JujaKalimoni Off Thika Super Highway
212.	Shake & Cream	+254722354080	jackquiemenye@gmail.com	TaitaStreet opposite Crown Paints
213.	Shake & Cream	+254722354080	jackquiemenye@gmail.com	TaitaStreet opposite Crown Paints
214.	Sigma Feeds Limited	+254721560246	sales@sigmakenya.com	Nairobi
215.	Sima grains Ltd	+254736544999	simagrainslimited@gmail.com	Next to RivatexOpp, Pyramid Packaging
216.	Simply Foods Ltd	+254726746759	nira@simpliyfoodslimited.com	Off Firms Road, OppAven
246.	Sky Foods Ltd	+254704050168	bnjoroge@skyfoods.co.ke	Juja Town Along Thika Superhighway
218.	Sky House of Cakes	+254714135904	lifetylesholdingsltd@gmail.com	Barngetuny Plaza Eldoret
219.	Slikridge Ltd	+254720347268	slikridge@gmail.com	Nakuru Industrial Area
220.	Spice World Ltd	+254734633000	info@spiceworldLtd.co.ke	Nanyuki Road Industrial Area
221.	Stockfeedfirms(K) Ltd	+254729209000	Stockfeed15@gmail.com	Nairobi
222.	Suguna Poultry (Kenya) Limited	+254780800500	leo@suguna.co.ke	Westlands
223	Sunbakefirms	+254720253555	sunbakeLtd@gmail.com	Obote Road, Kisumu

.	Ltd			
224.	Sunny Processors Ltd	+254733637090	sunny@dmblgroup.com	Office 12A Vishnu Indusrial Park
225.	Suntory Beverage & Food Kenya Limited	+254709068000	information@suntory.com	LaibonCenter 1st Floor, Lenana Road Kilimani
226.	Supa Snacks Ltd	+254(020)6539574	amigoskenya@gmail.com	Plot No. 209/726924 Bamburi Road Industrial Area
227.	Supa Sweets Ltd	+254736535831	supasweetslimited@gmail.com	Godown No. 6, George Moraa Avenue
228.	Tapioca Limited	+254731244000	accounts@tapiocakenya.com	Mazera Mombasa
229.	The Chocolate Bar Limited	+254702391111	info@chocolatebar.co.ke	Warehouse Premier Industrial Park Baba Dogo
230.	The Harvester Eco Farm Limited	+254700929766	makana@harvesrser.co.ke	Othaya Road, Lavington
231.	Top Food (EA) Ltd	+254702807776	info@topfoodea.co.ke	Road A Off firms Road Industrial Area
232.	Transmara Sugar Company Ltd	+254627200/1/2	info@transmarasugar.co.ke	EnooseanTransmara West Sub-County
233.	Trisquare Products Ltd	+254722751499	Skmbugua48@gmail.com	LR No. Dagoretti/Kangemi 742 Off Thiongo Road
234.	Tropical Heat Ltd	+254780888710	info@tropicalheat.co.ke	Munyaka Road Off Limuru Road
235.	Tropical Lush Ltd	+254 772250037	Adarsh84@gmail.com	Ngao Road
236.	Trufoods Ltd	+2547333767022	info@trufoods.biz	Jogoo Road, Opposite Church Army
237.	Umoja Flour Millers Ltd	+254724209544	info@umojamaintainance.co.ke	Garissa Road, Makongeni Area P
238.	Unga Group Ltd	+2547222205353	information@unga.com	Commercial Steet, Industrial Area
239.	Unipack Investment Limited	+254794855676	unipackinvestment@gmail.com	Central Business Park, Road C off firms Road GoDown 54
240.	United Millers Ltd	+254724303831	info@united.co.ke	Obote Road Industrial Area Kisumu
241.	Upfield Kenya Limited	+254719666742	info@summitrecruitment-search.com	Blixen Court Karen Road
242.	Valley Confectionery	+254722206555	bread@tosti.co.ke	Nakuru- Nairobi Highway, Lanet

	Ltd			
243.	Victory Farms Ltd	+254727481099	olgao@victoryfarmskenya.com	106 Thigiri Lane
244.	Wanji Food Industries Ltd	+254(020)650954/6	sales@wanjis.com	Nyahera Rd
245.	Weetabix East Africa	+254700330831	info@weetabixea.com	Lusingeti Road Off Likoni Road
246.	West Kenya Sugar Company Ltd	+254722786408	info@raisugar.com	Plot no. 548 south kabras, kakamega

Sources:(2022). Nairobi: KAM.

Appendix IV: Rotated Component Matrix

Item	Component											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1. Our organization has a well-defined supply chain strategy aligned with overall business goals	.796											
2. We regularly assess and update our supplier selection criteria to ensure quality and reliability	.765											
3. Our organization maintains clear communication channels with key suppliers for efficient information flow.	.759											
4. Our organization has a formal strategic sourcing process in place to identify and select suppliers	.746											
5. Supplier performance evaluations are conducted regularly to ensure compliance with established standards	.730											

Item	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
6. We actively seek to develop long-term relationships with key suppliers to enhance collaboration and value creation	.722											
7. Material requirement planning system ensures material is available for production and products are available for delivery to customers	-.688											
8. The increasing efficiency in the whole operating range done through improvements in material flow and so, shortened lead times, and reduced stocks	-.615											
9. Organisation simulates complex material flows for modelling and verification purposes	-.599											
10. Our company has an order processing system to capture order data from customer service employees or customers directly	.545											

Item	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
11. We use an order processing system to store the data in a central database and send order information to the accounting departments		.541										
12. Our company has carriers who fulfill the process of handling the goods to the customers' specified locations		.517										
13. Outsourcing of Warehousing Logistics has had an impact on the competitive advantage of our company		.670										
14. Our company has adopted various warehousing technology decisions to improve performance	.541											
15. Our company has embraced the use of route optimization software to support route planning for different delivery models		.517										

Item	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
16. The outbound logistics systems that have been embraced by our company have provided advanced visibility and a broader overview of shipment distribution			.642									
17. Our company uses logistics data to support the marketing team in planning digital marketing and advertising campaigns			.613									
18. The efficiency of our production processes enables us to minimize waste and maximize resource utilization.			-.523									
19. We effectively manage inventory levels to ensure a continuous supply of raw materials for production.			.484									
20. Our quality control measures effectively ensure that our food products meet regulatory standards and customer expectations.			.642									

Item	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
21. We integrate technology and automation into our operations to improve efficiency and productivity.			.613									
22. Our collaboration with suppliers ensures a reliable and cost-effective supply chain for raw materials and ingredients.				.628								
23. We monitor and optimize the performance of our production lines to achieve maximum output and minimize downtime.				-.587								
24. Our organization has a formal capacity planning process to ensure adequate production capabilities				.572								
25. We consider both short-term and long-term demand forecasts when determining production capacity				.628								

Item	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
26. Cross-functional collaboration is key in our capacity planning process, involving production, sales, and supply chain teams				-.587								
27. Our organization has well-defined processes for receiving raw materials and ingredients from suppliers.					.545							
28. We prioritize efficient unloading, inspection, and documentation of incoming shipments.						-.611						
29. Cross-functional teams are involved in the receiving process to ensure accuracy and quality.						-.606						
30. Proper storage conditions for raw materials and ingredients are maintained to ensure product integrity.						-.611						

Item	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
31. Our organization implements a first-in-first-out (FIFO) or a first-expiry-first-out (FEFO) inventory control system.						-.606						
32. We actively monitor the shelf life and expiration dates of incoming materials to prevent stockouts and waste							-.553					
33. Our organization maintains accurate and up-to-date inventory records using technology systems.							.433					
34. We regularly conduct physical inventory counts to reconcile system records with actual stock							-.553					
35. We have experienced reduced stockouts and improved on-time production due to efficient inventory control.							.642					

Item	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
36. Our organization has well-defined processes for receiving raw materials and ingredients from suppliers.							.613					
37. Our organization invests in upgrading and maintaining technological infrastructure to support manufacturing operations.								.642				
38. We actively seek out innovative technologies to improve production efficiency and product quality.								.613				
39. Our organization updates and improves its technology and systems to ensure they are the latest and most efficient								-.523				
40. Our organization had adequate employees with technical skills								.484				
41. Regular training is done on employees to equip them with technical skills								.642				

Item	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
42. Am satisfied with the effectiveness of technical capacity in our organization									.642			
43. Automation is a key aspect of our manufacturing processes, helping us achieve higher levels of consistency and precision.									.613			
44. We have embraced the use of technology in ensuring effective and efficient customer relations management									-.523			
45. Our organization utilizes technology to monitor equipment performance and conduct predictive maintenance									.484			
46. Our organization invests in upgrading and maintaining technological infrastructure to support manufacturing operations.										-.700		

Extraction Method: Principal Component Analysis.
a. 12 components extracted.

Appendix V: Research Permit NACOSTI

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **792734**

Date of Issue: **24/July/2024**

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License No: **NACOSTI/P/24/38306**

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