

**DISTRIBUTION NETWORK ECONOMY AND LOGISTICS
PERFORMANCE OF FRESH MILK PROCESSING FIRMS IN KENYA.**

BY

CHUGI SAMUEL K.

**A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF
THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF
MASTER OF SCIENCE IN SUPPLY CHAIN MANAGEMENT BY THE
SCHOOL OF BUSINESS, THE NAIROBI UNIVERISTY**

2022

DECLARATIONS

STUDENT'S DECLARATION

I declare that my work is original and this is the first time it is being submitted to an institution of learning - the University of Nairobi.

Signature: _____  _____

Date: __6th SEPTEMBER 2022__

SAMUEL K. CHUGI

D67/10435/2018

SUPERVISOR

This is to confirm that I have approved the submission of this research project to the university in my capacity as the student's supervisor.

Signature : _____  _____

Date: __9th SEPTEMBER 2022__

DR. OBARA P. MAGUTU

SENIOR LECTURER, MANAGEMENT SCIENCE AND PROJECT PLANNING DEPARTMENT.

FACULTY OF BUSINESS AND MANAGEMENT SCIENCE.

THE UNIVERSITY OF NAIROBI.

DEDICATIONS

To Enid, Ezar and Esther

ACKNOWLEDGEMENTS

To God, the giver of life, strength and the resources to pursue the academic journey. My family, thank you for the support, patience and sacrifice as I went through this academic journey. I would also thank Dr. Magutu for the patiently guiding and mentoring me throughout the research.

TABLE OF CONTENTS

DECLARATIONS	ii
DEDICATIONS	iii
ACKNOWLEDGEMENTS	iv
LIST OF FIGURES	vii
LIST OF TABLES	viii
ABBREVIATIONS AND ACRONYMS	ix
ABSTRACT	x
CHAPTER ONE: INTRODUCTION	1
1.1 Background of the Study	1
1.2 Research Problem	5
1.3 Objectives of the Study	7
1.4 Value of the Study	8
CHAPTER TWO: LITERATURE REVIEW	9
2.1 Introduction	9
2.2 Theoretical Framework	9
2.3 Distribution Network Economy	10
2.4 Empirical Literature Review	14
2.5 Summary of Empirical Review on Distribution Network Economy and Logistics Performance	15
2.6 Conceptual Framework	16
2.7 Summary of Literature Review	17
CHAPTER THREE: RESEARCH METHODOLOGY	19
3.1 Introduction	19
3.2 Research Design	19
3.3 Target Population	19
3.4 Data Collection	19
3.5 Data Analysis	20
CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION OF FINDINGS	21

4.1 Introduction	21
4.2 Response Rate	21
4.3 General Information	21
4.4 Distribution Network Economy	23
4.4.2 Distribution Information Technology Optimization	24
4.5 Distribution Network Economy and Logistics Performance	27
4.6 Discussions and Findings	29
CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS	32
5.1 Introduction	32
5.2 Summary of the Study	32
5.3 Conclusions	33
5.4 Recommendations	33
5.5 Suggestions for Future Research	35
REFERENCES	36
APPENDIX I; QUESTIONNAIRE	40
APPENDIX II; LIST OF FRESH MILK PROCESSING FIRMS IN KENYA	44

LIST OF FIGURES

Figure 2. 1 Conceptual Framework

17

LIST OF TABLES

Table 2.1 Summary and Gaps of the Empirical Literature Study	16
Table 3.1 Summary of Data Collection and Data Analysis	20
Table 4. 1 Rate of Response	21
Table 4. 2 General Information	22
Table 4. 3 Period of Existence	22
Table 4. 4 Distribution Network Collaboration	23
Table 4. 5 Distribution Information Technology Optimization	24
Table 4. 6 Transport Management	25
Table 4. 7 Backhaul Management	25
Table 4.8 Omni-channel Distribution Management	26
Table 4.9 Logistics Performance: Regression Model Summary	27
Table 4.10: Logistics Performance: ANOVA Analysis	27
Table 4.11: Logistics performance: Regression Coefficients	28

ACRONYMS AND ABBREVIATIONS

BWE	Bullwhip Effect
CPFR	Collaborative Planning, Forecasting and Replenishment
DNE	Distribution Network Economy
EPZ	Export Processing Zones
FMCG	Fast Moving Consumer Goods
IT	Information technology
KDB	Kenya Dairy Board
KEMSA	Kenya Medical Supplies Authority
RBV	Resource Based View

ABSTRACT

The study investigated how the distribution network economy influenced the logistics performance of fresh milk processing firms in Kenya. Determining the adoption levels of distribution network economy by fresh milk processing firms in Kenya and to establishing the relationship of distribution network economy and logistics performance of fresh milk processing firms in Kenya were the study objectives. The research design applied for the study was descriptive design and the target population was all the 42 licensed milk processing firms in Kenya as listed by the Kenya Dairy Board (2021). Primary data which acquired through the application of questionnaires was used. Questionnaires were administered through electronic mail and also dropped off at respondents premises and later picked up. For data analysis, descriptive statistics was used for objective one whilst regression analysis was used for objective two. On the first objective, it was established that distribution network collaboration and transport management were adopted to a large extent while distribution information technology optimization, backhaul management and omni-channel distribution management were moderately adopted by the fresh milk processing firms in Kenya. On the other hand, with p values of less than five percent, the findings indicate that distribution network economy - distribution network collaboration, transport management, distribution information technology optimization, backhaul management and omni-channel distribution - has a positive and significant relationship on logistics performance (logistics cost and timeliness) of fresh milk processing firms in Kenya. It is recommended that distribution information technology optimization, backhaul management and omni-channel distribution management be embraced to a larger extent as they were found to be moderately adopted. Future studies should also focus on distribution network economy strategies in other sectors – pharmaceutical firms, franchise outlets, retailers or even county governments - and not limit this to milk processing firms in Kenya. The context can also be decentralized from Kenya to the county levels like Uasin Gishu, Trans-Nzoia or Nairobi counties among others.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

To be successful in the volatile and highly competitive global economy, it is critical for firms to put in place distribution networks that are information driven, cost effective, extremely flexible, and responsive to customer needs whilst remaining aligned with the firm's strategic goals and growth ambitions (Mandel & Veetil, 2021). It is imperative that firms continuously reinvent their distribution networks to allow for growth and increase their capacity to embrace changes in their operational surroundings. The distribution process has changed from an inventory holding model to an information-rich model that is reliant on quality and timely information sharing by both suppliers and customers, through data linkages (Chen, Huang, Zhang, Yu, Tang & Huang, 2019). Modern customers not only expect firm's to provide customary distribution and warehousing activities, but are keen to work with firms that offer value-adding activities like technical support, automated ordering processes, and tailor-made financial services as opined by Ma (2020).

To meet the needs of customers for quicker deliveries, firms are increasingly making significant changes to their distribution frameworks. Firms are now able to reduce their delivery costs and build customer-centric distribution channels by centralizing their logistics operations, as observed by Zhu and Luo (2021). Contemporary information technology (IT) has played a vital role in enabling the transformation to a more centralized distribution system (Yi, Xu, Zhou, Wu & Sun, 2020). Logistical efficiency relies on continuous interchange of information that is precise, prompt and responsive between both external and internal logistics partners (Li, Zhou, Li & Dong, 2020).

Kenya is one of Africa's leading milk producers. Based on the e-dairy project (2019), large dairy farmers contribute 20 percent of the total milk produced and small farmers produce 80 percent of the milk in the country. Given the economic and social importance of the milk industry, an upgrade of dairy value chain and distribution channels is required to remove inadequacies and lower costs associated with processing, handling and processing, while at the same time enhancing the quality of milk from milk farms to the end users to achieve standards that are acceptable globally as well as domestically. Milk processing firms need to embrace the use of technology and engage in proper distribution channels so as to meet the customers' demands on time and meet the milk processing

firm's strategic goals. By doing so, the milk processing firms are able to reduce the costs involved with logistics and at the same time boost their logistics performance.

Theories that will be covered in the study to support the implementation of the distribution network economy in organizations include Resource Based View and Systems Theories. According to the Resource Based View (RBV), organizational capabilities may be a key driver of improved performance and enhanced competitiveness if and when these capabilities are employed to create unique value for customers in order to outperform competitors (Ludwig & Pemberton, 2011). The resource-based perspective holds that organizations can have a competitive advantage by having a distribution network that is well managed as this can be considered as a vital corporate resource (Sarkis, Zhu & Lai, 2011). Systems theory considers an event as a whole, rather than the constituents of its separate parts. A system is made up of interconnected subsystems that rely on, affect, and are affected by each other (Steele, 2003). A distribution network economy is thus made up of various players in the distribution channel that form a single network through which all the players can interact.

1.1.1 Distribution Network Economy

Efficient logistics and distribution can be described as the managing and optimizing of the forward and reverse logistics in the value chain to reduce delivery lead times, reduce total product delivery costs whilst ensuring environmental sustainability is observed by all players in the supply chain as explained by Jabłoński and Jabłoński (2020). A distribution network is the amalgamation of storage, handling, and transportation to ensure they are focused on meeting customer needs (Chen, Huang, Zhang, Yu, Tang & Huang, 2019).

A supply chain economy, according to Nargurney, Zhang and Dong (2003), is a network of interconnected activities related to manufacturing, sourcing, distributing and consumption of a single or multiple products, carried out by firms that work together towards a mutual goal. Thus, a collection of interlinked supply chains form a supply chain network economy (SCNE). A SCNE describes the environment - competitive and cooperative, in parts - of all the market-related and operation related activities of business firms, who belong to many supply chains that compete in several related markets (Nargurney et al, 2003). Understanding of this interdependence is fundamental in building a sustainable and effective distribution network.

Distribution networks assume diverse forms from trivial and simple-size networks to enormous and complicated networks of logistics operations adopted by big firms like Amazon or Apple. A distribution network is an interrelated group of warehouse facilities, transport systems and general distribution events that stores products and later delivers them to clients (Rafi & Dhal, 2020). It is an intermediary point of obtaining goods from the vendors to the end user, either directly or through retailers. It is paramount to have a reliable and fast distribution network in the contemporary competitive business environment as noted by Li, Zhou, Li and Dong (2020). A distribution network leads to lower logistics costs, customer satisfaction achieved through collaboration and transparent dealing among partners, which in turn delivers faster and sustainable growth as noted by Mandel and Veetil (2021).

Distribution network refers to the distribution system that has been put in place to supply goods and services to the customer. Distribution Network Economy (DNE) is a network of interconnected activities associated with distribution and conducted by numerous coalitions of business organizations acting together through alliances to achieve economic gains (Chen et al., 2019). In a distribution network economy, entities do not only act in isolation for their own benefit but also engage in activities that are beneficial to the other supply chain partners. Zhu and Luo (2021) state that members of a distribution network economy network jointly create and share value and that the size of the network gives rise to economies of scale. Organizations must recognize that their fate are inextricably linked to those of other members of their network. Most firms have realized that they cannot work independently and thus they need to form strategic alliances and build relationships with both the suppliers and the customers (Metelenko et al., 2021).

1.1.2 Logistics Performance

Logistics functions extend beyond the physical movement of goods to include supplier and customer relationship management. Logistics management seeks to meet customer needs through the integration and coordination of all supply chain activities. Thus, efficient logistics entails transfer of goods and services from one place to another smoothly while eliminating inefficiencies. Managing logistics is the bedrock of a distribution network economy (Schroeder, Pennington-Gray; Donohoe, 2013). According to Bhagwat and Sharma (2009) one of the major milestones firms face in today's changing business environment is having the ability to analyze and measure logistics performance.

Logistics has become the backbone of everyday business and is proving to be a key differentiator in most markets in order to meet customer needs (Bowersox & Closs 1996; Gunasekaran & Ngail, 2003). Because of the elevated level of competition, there is increased pressure to diversify products and services and to operate with lower prices as a focal point. Logistics managers can be successful in managing these aspects, which end up being a strategic tool for value creation (Melnik, Narasimhan & DeCampos, 2014).

Logistics performance entails meeting customer needs, lowering transit time, minimizing or cutting costs, differentiating products or services, and managing customer or supplier relationships. According to Neuman (2006) and Poter and Millar (1985), analysis of logistics performance is a current trend that involves planning and monitoring in order to identify links between the outcomes of the pointers and the organization. It also determines how well corporations achieve their tactical aims in order to gain a competitive edge.

Fugate, Mentzer, and Stank (2011) demonstrated that logistics performance has multiple dimensions and is dependent on the resources used in logistics in accordance with the aims and results in comparison to other players. According to the authors, logistics performance analysis should be based on evaluating a set of aspects of logistics tasks such as distinction, effectiveness, and efficiency. According to Fugate et al. (2011), the dimension of efficiency relates to how well a resource allocated to the logistics function is used, the dimension of effectiveness is the extent to which organizational objectives are met, and the dimension of differentiation is the value created by customer service elements in comparison to competitors. The higher the quality of the human resource in logistics cooperative work, planning, and implementation of customer requests, the lower the levels of redundancy, fights, and customer grievances. This, in turn, will lead to a high level of efficiency as a result of faster response, reduced waste and capital invested, and thus higher logistics efficiency and a higher likelihood of meeting targets and deadlines (Robb, Xie & Arthanari, 2008).

1.1.3 Fresh Milk Processing Firms

Dairy production and commercialization of dairy products in Kenya dates back to 1900, when colonial settlers controlled the industry. As Africans applied pressure to gain a portion of the dairy industry during that period, the sector needed to expand and accommodate the locals so as to produce and compete for market share. In the early 1940s, a committee headed by the Department

of Agriculture was formed, which resulted in the establishment of the Swynnerton plan in 1948, which endorsed the insertion of the locals in dairy farming. As whites and natives fought to control a share of a small market and enhance the quality of milk and related produce, a recommendation was made in 1955 that a body be formed to regulate milk and milk product standards in Kenya. This resulted in the establishment of the Kenya Dairy Board (KDB) in 1958 as a result of an Act of Parliament, CAP. 336 laws of Kenya. According to the Kenya Dairy Board website, there are 42 milk processing firms in Kenya (KDB, 2021). The Board's mandate is derived from this Act. KDB is in charge of developing, promoting, and regulating the dairy sector. The main functions of KDB include the enforcement of national dairy industry standards, industry training, facilitation of stakeholders' activities, the maintenance of a dairy industry database, and import regulation (EPZ, 2019).

In Kenya, the dairy value chain is a significant socioeconomic enterprise. Milk production provides a consistent and stable source of nutritious food and cash in rural locations. Value-added operations such as milk bulking, shipping, processing, marketing, and retailing provide additional socioeconomic benefits such as job generation and milk product diversity. According to a paper published by the Kenya Dairy Board (2018), milk processing enterprises have created 1.2 million jobs, both directly and indirectly, and have contributed 4% of GDP. According to the data, the dairy cattle population is 4.5 million heads, with an annual milk yield of 5.28 billion litres.

Kenya's fresh milk processing enterprises have grown through time, and the distribution network is getting increasingly difficult. Because of the perishability of their products and the fragmented nature of their clientele, this is the case. Among the challenges faced by milk processing companies is making sure that all milk and milk products are safe, fresh, and manufactured in the most efficient and ecologically responsible manner possible. These difficulties can be avoided by establishing an appropriate distribution network that is efficiently and successfully managed.

1.2 Research Problem

According to Zhu and Luo, the distribution network economy impacts the firm's ability to meet their customer requirements and value delivery (2021). This, in turn, will have an impact on the logistical performance and optimization level of the whole supply chain (Alexandre, 2008). Fresh milk processing companies deal with perishable products; therefore, they require an effective and

efficient distribution network system and channels to ensure that their clients receive their products on time and in good condition (Yigitbasioglu, 2011). In today's commercial environment, the emphasis is moving from individual firm's performance to their supply chains (SC) performance, which is a strategy taken by the whole value chain to meet customer expectations ensuring adequate product availability and responsive enough to ensure on-time delivery (Dairy Report, 2019). However, uncertainty affects the entire operations of a supply chain, resulting in the Bullwhip Effect (BWE), which contains a negative effect on the effectiveness of the supply chains (Bakos, 2009).

The fresh milk supply chain is one of the more complex supply chains in Kenya due to uncertainties at each stage of the value chain, which bring about operational inefficiencies that are exacerbated by infrastructural bottlenecks caused by poor road networks and an underdeveloped cold chain resulting in high wastage levels (Atieno & Karuti, 2008). Due to the perishability of milk, efficient distribution network selection is critical to provide downstream value through timely delivery to end users; otherwise, numerous consumer complaints and losses are expected (Saremi & Zadeh, 2014).

There have been several related studies that have been done on this topic at both locally and globally. Jaboski, Timmers and Sarkis (2020) conducted a study on the sustainability of business models in the network economy and discovered that the network economy has a large influence on a firm's sustainability and that automation and digitization of processes in a firm is critical in a network economy. Suray, Hrazhevskaya, Yakovenko, Suprunenko, Sabadosh, and Gerashchenko (2020) concentrated on transformation of public administration in a networked economy. Their study concluded that digital technologies, and use of information technology heavily influences public administration performance and can be a tool in the modernization of public administration. Schlossberger (2018) investigated the Distribution of Outcomes for a Networked Economy and discovered that networks formed through collaboration and supported by efficient technology can have a significant impact on product distribution while also aiding in the improvement of a firm's economy and performance. In their study on sustainable distribution networks, Hulthén and Gadde (2009) determined that for a distribution network to be sustainable, there must be close collaboration between suppliers, supply chain integration, effective information sharing, and investment in technology and information systems. Ustyuzhanina, Evsukov, and Komarova (2018)

regard the network economy as a new economic system, noting that its adoption and embrace at any level of the organization is bound to result in economic gains.

Locally, Muhalia, Ngugi, and Moronge (2021) investigated the impact of transportation management systems on the supply chain performance of FMCGs in Kenya, discovering that transportation management systems had an impact on the FMCGs' supply chain performance. Wamalwa, Upadhyaya, Kamau, and McCormick (2019) conducted a case study on food processing enterprises in Nairobi to establish techniques employed by successful industrial firms. The data shows that price differentiation, cost minimization through proper distribution networks, and niche marketing are the most important strategies adopted by agro-processing enterprises. On the impact of distribution techniques on the performance of Kenya Medical Supplies Authority (KEMSA), Opati (2018) observed that efficient distribution network strategies influenced KEMSA's performance. Nderitu and Njuguna (2017) investigated the impact of retail distribution tactics of Kenyan oil manufacturing enterprises, with a particular focus on Vivo Energy. According to the findings, retail distribution techniques and retail network growth have a beneficial impact on Vivo energy's competitive advantage. Maina (2016) on channel distribution strategy and customer satisfaction of Mombasa beverage distributors established that retail, depot, online and personal distribution strategies actively and directly influence customer service levels.

Based on the preceding studies, there is a need to study the distribution network economy of the fresh milk processing firms in Kenya and thus the need for the current study. The purpose of the paper will be to determine how the distribution network economy influences the logistics performance of fresh milk processing firms in Kenya. This study will seek to answer the following research questions; to what extent has the distribution network economy been adopted by fresh milk processing firms in Kenya? and what is the influence of the distribution network economy on logistics performance of fresh milk processing firms in Kenya?

1.3 Objectives of the Study

The objectives that will guide the study are:

- i. To determine the extent of distribution network economy adoption by the fresh milk processing firms in Kenya and

- ii. To establish the effect of the distribution network economy on the logistics performance of the fresh milk processing firms in Kenya.

1.4 Value of the Study

The outcome of this paper will be of assistance to the leadership and management of the milk processing firms. The findings can be used in solving the problems encountered in distribution networks and try to come up with ways through which the challenges can be mitigated. The findings are expected to benefit the dairy industry's management in designing an effective and efficient distribution network economy. It will also be useful to the policy makers in the dairy sector because it will identify the challenges facing the sector and come up with appropriate policies to optimize the fresh milk distribution networks.

The study will add onto the theory in the field of distribution network economy adoption by analyzing whether the distribution network economy in literature can be applied by fresh milk processors in Kenya. It will also help authenticate the empirical standpoints that inform distribution network implementation. Such can be used by researchers, academicians and scholars and government policy makers. The study will be a good groundwork upon which further research into other issues related to the distribution network economy can be studied.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The chapter will cover theories, a broader view of the distribution network economy, related studies and gaps, and conclude with a conceptual framework.

2.2 Theoretical Framework

Whilst several theories govern distribution network economy, the study will be anchored by two theories namely; Resource Based View (RBV) Theory and Systems Theory.

2.2.1 Resource Based View Theory

The theory argues that organizations which own strategic resources have a significant competitive advantage over those that do not. A strategic resource is one that is valuable, difficult to imitate, difficult to find, and cannot be easily substituted (Barney & Chi, 1991). A valuable resource is one that can influence an entity to develop strategies that capitalize on opportunities to beat stiff competition. This theory emphasizes the advantages a company gains from having the resources it needs to survive. Financial might, strategic locations, a dedicated and competent labor force, and technological superiority are some of the resources that a firm can capitalize on. The resources can distinguish a firm from its competitors as well as give it a competitive edge. Unique product and service offerings, capabilities as well as specialized comprehensive work practices will enhance a firm's competitiveness for resources (Prahalad & Hamel, 1999). A supply chain that is well managed and is sustainable is important in creating a competitive edge and adding value at the same time (Lambert & Cooper, 2000).

This theory is pertinent to the study because it emphasizes the importance of the entity having unique and strategic resources. Fresh milk processing companies in Kenya can turn their distribution networks into a strategic asset by implementing strategies such as omni-channel distribution, shorter lead times, and faster delivery via a managed transportation system. This will offer them an advantage over the competition. The firm may consider process automation, integration of supply chain partners, and strategic cooperation among all parties as a strategic resource.

2.2.2 Systems Theory

According to Martinelli (2001), systems theory perceives an event as a totality rather than the constituents of its distinct subsystems. A system is made up of subsystems that interact with one another, and the subsystems rely on, affect, and are influenced by each other (Steele, 2003). According to Mason, a firm is dependent on the surroundings in which it functions, which includes suppliers, competitors, and customers (2007). The idea integrates various supply chain members such as suppliers, customers, and workers of the firm, resulting in a sole supply chain network as observed by Fowler (2000). The theory is designed in a methodical manner to explain the dynamics that constitute sustainable distribution (Martinelli, 2001). For example, a firm's structure, culture, staff, IT infrastructure and connectivity of supply chain must all be factored for an efficient distribution network economy (Mason, 2007).

The systems perspective idea theory can be used to understand the distribution network economy. Since all supply chain partners and players are interdependent on one another, for it to be entirely successful and sustainable, there must be teamwork, mutual trust, and working toward the same goals by all supply chain partners and participants. Individual members of the distribution process can also be considered as subsystems that, when combined, form a complex system whose goal is to improve a firm's performance and build a distribution network economy.

Physical distribution can also be considered as a system of interconnected components that allows for the proficient transportation of goods and services. Customer service levels, warehouse and transport activities, order processing, the control and management of inventory, eco-packaging and handling of materials are the constituents used to characterize physical distribution using a system approach. Since these components are interconnected, actions taken in one area have an impact on the relative efficiency of others. According to this theory, physical distribution is viewed as a system of wholesalers, distributors, merchants, and clients regulated in one central system to achieve a distribution network economy.

2.3 Distribution Network Economy

The distribution network economy strategies that firms engage in to enhance their logistics performance and are discussed by the paper include Collaboration, Information Technology, Transport Management, Backhaul Management, and Omnichannel Distribution Networks.

2.3.1 Distribution Network Collaboration

Relationships are strengthened through collaboration. In supply chains and alliance networks, the firm, its clients, and suppliers can collaborate to add value and mutual benefit. Although supply chain collaboration has several advantages like end-to-end supply chain visibility, flexibility, and shorter lead times, achieving it may not always be achievable (Baah, Acquah & Ofori, 2021). The primary motivation for collaboration in the distribution network economy is to improve trust and synchronization, increasing synergies and achievement of higher revenues (Mofokeng & Chinomona, 2019). To be successful, it is critical that a firm collaborates with its supply chain partners. The ability of at least two self-sufficient enterprises to work well together, arranging and executing store network operations toward shared objectives is defined as joint effort in a production network (Kumar, 2020). Distribution Network optimization technologies deliver a platform for interaction with chain members and information sharing which is pertinent in critical decision making for best results.

To function properly, the distribution network economy must collect relevant information from different partners in the supply chain, necessitating the need for trust and commitment of all the members. Real-time visibility improves decision making power at both strategic and tactical levels which enhances a rapid response to network disruptions (Duong & Chong, 2020). Collaborative Planning, Forecasting, and Replenishment (CPFR) systems are adopted in the retail sector to improve coordination among retailers' supply partners along the upstream and downstream value chain, so that vendors are more informed of consumer demand, and they will be better placed to manage replenishment as well as control inventory with their associated costs (Dubey et al., 2021). There is also a requirement for systems such as Customer Relationship Management (CRM) and Supplier Relationship Management (SRM) to improve collaboration between the firm and its clients and suppliers (Kotzé, Botes, & Niemann, 2017).

2.3.2 Distribution Information Technology Optimization

For the empowerment of the supply chain members, the firm is required to deliver real-time data on events, customer needs, capacity information and other relevant information (Yu, Huo & Zhang, 2021)). Therefore, organizations need to employ technological tools and innovations that will optimize their distribution processes by increasing network visibility and provide network modeling capabilities (Yeniyurt, Wu, Kim & Cavusgil, 2019). Network optimization technologies

offer a podium that enables collaboration and information critical for scenario analysis for better decision modelling and enhanced integration along the value chain. Information technology optimization enhances visibility along the chain as well as enhancing tactical decision-making and enables firms to react and respond promptly to interruptions within the network (Han, Wang & Naim, 2017).

To remain relevant and competitive, stakeholders in the value chain network depend on prompt information sharing for quick decision-making. This information can only be made available to the key players by the use of information systems through system integration across the supply chain (Gu, Yang & Huo, 2021). Information technology in the supply chain within and across organizations enables the timely flow of information as and when it is required among the supply chain partners and players. For example, it is critical for a company to have a corporate portal that suppliers and customers may use. Suppliers and customers can easily gain access to databases, necessary workflows, and application systems via this portal (Vanpoucke, Vereecke & Muylle, 2017). Depending on the sector, these portals should be adapted to appropriate distribution channels. Thus, information technology emerges as one of the fundamental components of good information management in the distribution network economy (Afshan, Chatterjee & Chhetri, 2018).

2.3.3 Transportation Management

Transportation is a key component of distribution since it facilitates the transfer of products, services and people from one location to another (Hasan, 2013). Transportation aids in the delivery of time utility to products and ensures that the products are available to customers at the appropriate time and location so that they can be consumed (Murphy, 2012). Transportation management is critical in the distribution network economy because it connects the various nodes in the supply chain. Al-Odeh and Smallwood (2012) list several factors to consider when developing an effective and efficient transportation system, including transportation modes, operational practices, infrastructure, and fuel. According to Amemba et al. (2013), businesses can use railways, which are more efficient in large load transportation. Entities can also create distribution facilities near delivery points or form cooperation and alliances with other companies and distributors to lessen the distance traveled (Al-Odeh & Smallwood, 2012). This will improve logistical performance by reducing waste in the supply chain.

Route planning and scheduling is also another aspect of transport management that is vital in enhancing logistics performance. Route planning enables firms to ascertain the routes that are most efficient when moving products from one supply chain node to another. Transport innovations play a vital role in ensuring that the distribution network economy is achieved by improving the efficiency of fuel engines, implementation of intelligent management systems of transportation like using robots within the warehouse and having automatic guided vehicles and ensuring that vehicle load is fully utilized (Murphy, 2012).

2.3.4 Backhaul Management

Backhaul is defined by Zhang and Zheng (2011) as the practice of having the vehicle take something back to its destination after making a delivery rather than going back empty. Backhaul management makes economic sense because the truck consumes nearly the same amount of gasoline and takes nearly the same amount of time to return to the focal organization (Murphy, 2012). According to Muma et al. (2014), Walmart has been able to use this as a tactic, allowing them to gain a competitive advantage and minimize shipping costs. Backhaul management assists an entity in optimizing truck loading by avoiding empty trips back to the destination, hence making the distribution network economically feasible (Hasan, 2013)

Empty backhaul is a significant issue that impacts and impedes the distribution network economy, particularly in transportation. Empty backhaul occurs when a truck delivers a product to its destination and then returns to the enterprise empty (Zhang & Zheng, 2011). This makes improving logistics performance challenging because it adds to the total business expenses. Companies have been forced to develop alliances and agreements with other distributors and entities to manage and curb empty backhaul problems and positively influence their logistics performance (Murphy, 2012). Empty backhaul generates a large number of non-value-adding trips, wasted energy, and significantly contributes to air and noise pollution (Hasan, 2013). Poor planning and a lack of coordination with the eventual recipients, primarily retailers or customers, result in empty backhaul (Amemba et al., 2013). The remedy for empty backhaul is collaboration and information sharing, combined with adequate planning. This will assist in reducing unnecessary travel, saving energy and money, and reducing both air and noise pollution (Amemba et al., 2013).

2.3.5 Omni-channel Distribution Network

An Omni-channel distribution network where the firm is able to provide services and products to their clients wherever the clients want them to as noted by Hole, Pawar and Khedkar (2019). The clients can receive the product at their convenience whilst affording the firm a chance to manage their logistics efficiently. The firm provides an array of options in that the client can order a product virtually or electronically and decide where they want the product to be delivered whether at selected stores or at the convenience of their homes (Cai & Lo, 2020). It is a combination of the traditional brick-and-mortar outlets and the evolving electronic commerce product offering.

The contemporary omni-channel shopper has forever altered the retail distribution industry. Empowered, agile and information savvy omni-channel buyers use multiple channels whilst anticipating exceptional customer service and experience that encompasses both in-store and online shopping advantages as observed by Ishfaq, Defee, Gibson and Raja (2016). Meeting client's expectations in an omni-channel distribution is a challenging task and firms that successfully achieve this feat stand a high chance of enhancing their revenue through retaining key client bases as pointed out by Melacini, Perotti, Rasini and Tappia (2018).

Omni-channel distribution grants the need to capitalize on client's feedback to be able to move from the traditional distribution channels to the contemporary omni-channel distribution offering (Ishfaq, Defee, Gibson and Raja, 2016) due to ever changing client's preferences which can no longer be solved by the traditional distribution strategies. Therefore, there is a need to clearly comprehend the needed service of a distinctive omni-channel consumers.

2.4 Empirical Literature Review

A number of researchers have conducted studies on the distribution network economy and related topics. This section contains studies on distribution network and logistics performance that are connected. It also identifies the gaps that the study intends to fill. Jaboski et al. (2020) established that the network economy influences sustainability of a firm and that automation and digitalization of operations in a firm are critical in a network economy. The methodology used for this paper was a systematic literature review. The general network economy was the focus, not the distribution network economy. Suray et al. (2020) concentrated on Public Administration Transformation in a Network Economy. It was established that adoption of both digital and

information technologies are both a tool for implementing a modernization strategy for public administration and also heavily influences the direction of change. The sector covered was not milk processing firms, but public administration.

Schlossberger (2018) investigated the distribution of outcomes for a networked economy and discovered that networks formed through collaboration and supported by efficient technology can have a significant impact on product distribution while also aiding in the improvement of a company's economy and performance. Ustyuzhanina et al. (2018), in their paper on network economy as a new economic system, found that the adoption and embracing of a network economy at any level of the organization is bound to result in economic gains. The study used a systematic literature review and secondary data rather than primary data.

Muhalia et al. (2021) investigated the impact of transportation management systems on FMCG supply chain performance in Kenya. Using a descriptive research design, the study conducted a census of all FMCG firms in Nairobi. Transport management systems were discovered to have an impact on the performance of supply chains of Kenyan-based FMCG firms. Focus was on transport management systems and not the distribution network economy. Opati (2018) examined the influence of distribution strategies on performance of the Kenya Medical Supplies Authority (KEMSA) and observed that efficient distribution network strategies influenced the performance of KEMSA. The approach employed for this study was a descriptive case study and it focused on the general distribution tactics, and not the distribution network economy. Nderitu and Njuguna (2017) conducted a study on retail network expansion and competitiveness of Kenyan oil marketers. The descriptive study design was performed with a population of all 111 Vivo Energy employees working at the headquarters. The study included both primary and secondary data, and it was discovered that retail network growth substantially impacted Vivo energy's competitiveness. The metric was based on competitive advantage rather than logistics performance.

2.5 Summary of Empirical Review on Distribution Network Economy and Logistics Performance

Empirical review is summarized based on the author, the area of focus, the methodology adopted, the key findings, and the gap of the study. The summary is presented in Table 2.1

Table 2.1 Empirical Literature Study: Summary of Gaps

Author(s)	Focus of the Study	Methodology	Study Findings	Research Gap
Jabłoński et al. (2020)	Sustainability and Network Economy	Systematic Literature Review	Sustainability is influenced by the network economy	Focused on general network economy and not distribution network economy
Suray et al. (2020)	Transformation of Public Administration in a Network Economy	Descriptive Design	Digital technology and ICT in vital in a network economy	Focused on public administration and not milk processing firms
Schlossberger (2018)	Distribution Outcomes for a Networked Economy	Descriptive Research Design	Collaboration and ICT enhances Distribution Network Economy	Logistics performance was not covered
Ustyuzhanska et al. (2018)	Network economy as a new economic system	Systematic Literature Review	Network economy enhances economic gains of a firm	Secondary data was employed and not primary data
Muhalia et al. (2021)	Transport Management and Supply Chain Performance	Descriptive Design	Transport management influences supply chain performance	Focus on transport management and not distribution network economy
Muhalia et al. (2019)	Strategies of Kenyan Firms	Descriptive Design	Proper distribution network enhances cost reduction and performance	Study on food processing firms and not fresh milk processing firms
Opati (2018)	Distribution Strategies and Performance at KEMSA	Case study	Distribution strategies influenced performance	Adopted a case study and not a census
Nderitu and Njuguna (2017)	Retail Network Expansion and Competitive Advantage	Descriptive Design	Retail network expansion enhances competitive advantage	Measured influence on competitive advantage and not logistics performance

Source: Research Data (2021)

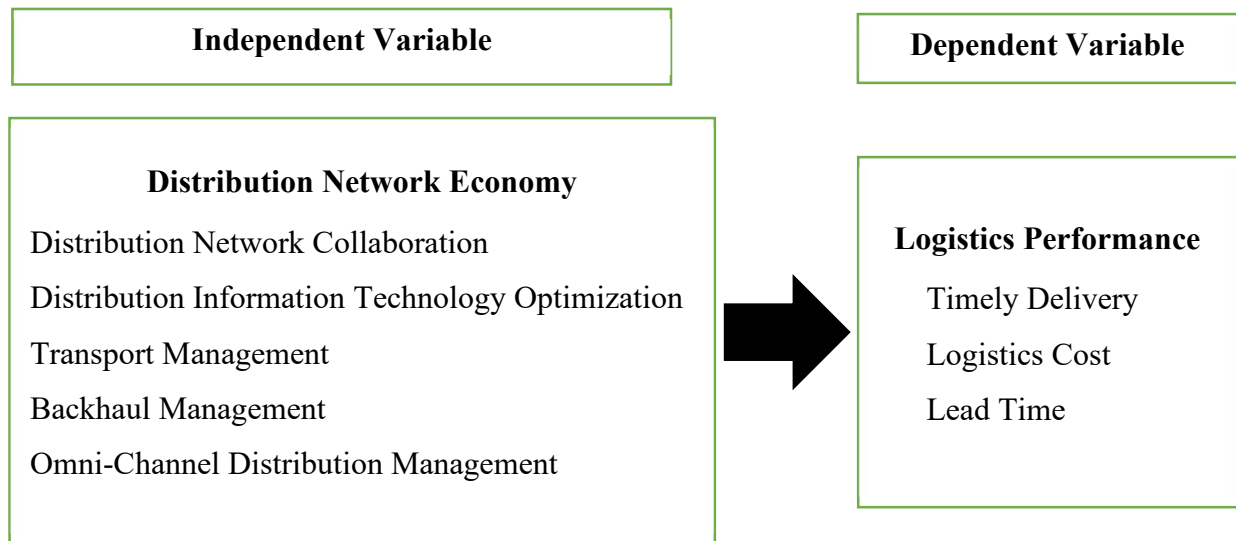
2.6 Conceptual Framework

Conceptual framework is a schematic presentation of variables under study to be able to realize order set objectives (Akhtar, 2016). It is the diagrammatic representation of the variables under study and shows the correlation amongst the independent and the dependent variables as defined

by Robson and McCartan (2016). Independent variables are concepts that can be manipulated by the researcher to ascertain its impact on another concept as noted by Cooper and Schindler (2003).

The independent variable of this study is the distribution network economy, which is characterized by distribution network collaboration, distribution information technology optimization, transport management, backhaul management and omni-channel distribution management. The dependent variable is logistics performance which is operationalized by delivery time, distribution cost and lead time. It is hypothesized that the distribution network economy positively influences logistics performance of fresh milk processing firms in Kenya.

Figure 2.1 Conceptual Framework



Source: Researcher (2021)

2.7 Summary of Literature Review

This chapter has reviewed the adopted theories which are related to the study. Resource based view is pertinent to the study as it emphasizes the importance of milk processing firms in Kenya having unique and strategic resources which they can turn their distribution networks into a strategic asset by implementing strategies such as omni-channel distribution, shorter lead times, and faster delivery via a managed transportation system. Systems theory is also vital as physical distribution can be considered as a system of interconnected components that allows for the proficient transportation of items by the milk processing firms in Kenya.

The distribution network economy strategies which have been covered by the study entails distribution network collaboration, distribution information technology optimization, transport management, backhaul management and omni-channel distribution management. These practices are hypothesized to positively influence logistics performance through timely delivery and minimizing of logistics cost as illustrated by the conceptual framework.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

Methodology is a set of stages, procedures, and strategies for acquiring and interpreting information in a research project (Bryman & Cramer, 2012). This chapter entails the method that will be adopted by the paper to collect and analyze data. The chapter includes design, study population, data collection and analysis methods.

3.2 Research Design

A descriptive research design will be used by the study. Descriptive research entails gathering information about a phenomenon's current state to aid in describing "what exists" relative to concepts in a phenomenon (Greener, 2008). This approach is appropriate since it allows for a feasible assessment of the findings. Furthermore, it provides the comprehensive and inclusive investigation essential in research studies. Furthermore, a descriptive design will be used as it is capable of collecting precise data and providing a clear picture of the subject under investigation.

3.3 Target Population

The study's target population will be all 42 Licensed Milk Processing Firms in Kenya as listed by the Kenya Dairy Board (2021) and shown in APPENDIX II. A population is the entire set of elements from which the researcher is required to draw conclusions as observed by Cooper and Schindler (2003). Given the small and manageable population, a census will be conducted.

3.4 Data Collection

Primary data sources will be utilized to collect the relevant data for this study with the aid of a structured questionnaire. Since the study will be conducted in the midst of a pandemic, electronic mail and online platforms - Google forms and Survey Monkey - will be the mode of administering the questionnaire. A single questionnaire will be administered to the logistics and warehousing managers in the 42 fresh milk processing firms in Kenya. The managers have been chosen as they are directly involved in the distribution process and respondents are knowledgeable in the subject under study. The questionnaire will be categorized into three sections based on the study objectives. Section A will consist of biographic information, section B will be made up of

distribution network economy strategies while section C will consist of logistics performance measures based on the adoption of distribution network economy.

3.5 Data Analysis

Gathered data will be analyzed through descriptive statistics and regression analysis. Questionnaires will be scrutinized to make sure that the data is complete and accurate. Objective one (Extent of adoption of Distribution Network Economy) will be analyzed using descriptive statistics (Standard Deviation & Means) while objective two (Correlation between Logistics Performance and Distribution Network Economy) will be analyzed using regression analysis. SPSS will be used as the analysis tool. Regression model that the study will use is:

$$Y = \beta_0 + \beta_1X_1+ \beta_2X_2+ \beta_3X_3+ \beta_4X_4+ \beta_5X_5 + e$$

Where;

Y = Logistics Performance

X₁ to X₅ is Distribution Network Economy

e = error term

β₀ = constant

Table 3.1 Data Collection and Analysis Summary

Objectives	Data to be collected	Data collection tool	Analysis needed
General Information	SECTION A	Structured Questionnaire	Descriptive Statistics (percentages)
The extent of adopting the Distribution Network Economy by Milk Processing Firms in Kenya.	SECTION B	Structured Questionnaire	Descriptive Statistics (Mean and Standard Deviation)
The correlation between Distribution Network Economy and Logistics Performance of Milk Processing Firms in Kenya.	SECTION C	Questionnaire	Regression analysis

Source: Researcher (2021)

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND REVIEW OF FINDINGS

4.1 Introduction

The research aimed at establishing the influence of the distribution network economy on logistics performance of fresh milk processing firms in Kenya. This chapter focuses on analysis of the data collected from the respondents, tabulation of the results, reviews and discusses the findings guided by the research objectives.

4.2 Response Rate

The study sought to cover all 42 fresh milk processing firms in Kenya. The researcher managed to collect 34 filled questionnaires which presented a response rate of 80.95% which was considered to be sufficient for data analysis. Table 4.1 breaks down the outcome of the data collection.

Table 4.1 Response Rate

Metric	Count	Rate
Questionnaires Returned	34	80.95
Questionnaires not Returned	8	19.05
Total	42	100

Source: Study Data (2021)

4.3 General Information

The general information collected from the fresh milk processing firms in Kenya to better understand the respondents as well as the manufacturing firms themselves. The details covered included positions that the respondents occupied in the processing firms and their tenure in the fresh milk processing firms, of which the results were discussed subsequently.

Table 4.2 illustrates that 32.35% of the respondents were supply chain managers, 26.47% were operations managers and 41.18 were logistics or distribution managers. This is an indication that all the respondents were at a managerial position and were best placed in answering the questions under study due to their vast knowledge.

On how long the managers had worked for the fresh milk processing firms in Kenya, 8.82% of the respondents had worked for less than two years, 23.53% had worked for periods between three to five years while 35.29% had worked for six to ten years. 32.35% of the respondents had worked

for over ten years in their respective firms. As per the outcome, 67.64% of the managers had worked for more than six years in the fresh milk processing firms and hence were experienced and knowledgeable enough to answer the questionnaires

Table 4.2 General Information

Position Held	Count	Percent (%)
Operations Manager	9	29.47
Supply Chain Manager	11	32.35
Logistics/Distribution Officer	14	41.18
Length of service		
Below 2 years	3	8.82
3 -5 years	8	23.53
6 -10 years	12	35.29
Over 10 years	11	32.35
Total	34	100

Source: Research Data (2021)

4.3.2 Period of Existence

The respondents had to answer the period in which their fresh milk processing firms had operated in Kenya and table 4.3 shows the responses.

Table 4. 3 Period of Existence

Period of Existence (years)	Frequency	Percentage (%)
Below 5 years	4	11.76
5 – 10 years	8	23.53
Over 10 years	22	64.71
Total	34	100

Source: Research Data (2021)

Table 4.3 indicates that 11.76% of the fresh milk processing firms had operated in the country for less than five years while 23.53 % have been operational for periods ranging from five to ten years, whilst the other 64.71% have been operated for 10 years and above. This points out that majority of the fresh milk processing firms represented by 88.24% have been operational for more than five years which is a substantial period of time for them to be knowledgeable on distribution network economy and its impact on various performance.

4.4 Distribution Network Economy

Objective one of this study sought to determine the extent of adoption of the distribution network economy by fresh milk processing firms in Kenya. The distribution network economy strategies covered include distribution network collaboration, distribution information technology optimization, transport management, backhaul management and omni-channel distribution management and the findings are presented below.

4.4.1 Distribution Network Collaboration

The study sought to determine the extent that fresh milk processing firms in Kenya had adopted distribution network collaboration and the outcome are presented in the table 4.4 below.

Table 4. 4 Distribution Network Collaboration

Factor	Mean	Std. Dev
The firm collaborates with strategic suppliers	3.91	1.029
The firm collaborates with key customers	3.54	1.464
The firm practice interdepartmental collaboration	3.62	1.381
The firm has improved coordination and trust amongst all supply chain partners	3.57	1.467
The firm shares best practices with our supply chain partners	3.42	0.529
General Score	3.59	1.369

Source: Study Data (2021)

From table 4.4, firms collaborating with strategic suppliers (M=3.91, SD=1.03), the firms collaborating with key client's (M=3.54, SD=1.46) and the firms practicing interdepartmental collaboration (M=3.62, SD=1.38) indicate that distribution network collaboration practices were all adopted to a large extent by the fresh milk processing firms in Kenya. Improved coordination and trust amongst all supply chain partners was adopted to a large extent by the mean of 3.57 and standard deviation of 0.5 with sharing best practices with strategic supply chain partners being adopted to a moderate extent by the fresh milk processing firms with the mean of 3.42 and standard deviation of 0.53. Generally, the fresh milk processing firms have adopted distribution network collaboration to a large extent, an indication that more focus has been given to the strategy because of its benefits.

4.4.2 Distribution Information Technology Optimization

The study sought to determine the extent of adoption of distribution information technology optimization by fresh milk processing firms in Kenya and the outcome are presented below.

Table 4. 5 Distribution Information Technology Optimization

Factor	Mean	Std. Dev
The firm has invested heavily on information technology	3.45	1.65
The firm seamlessly shares vital information through network technologies	3.42	1.71
The firm stores vital information with the aid of Information Technology.	3.31	1.78
Information Technology is used to integrate all supply chain partners to form a distribution network	3.38	1.76
The firm has competent information technology personnel	3.29	1.87
General score	3.37	1.68

Source: Study Data (2021)

Table 4.5 shows that investing heavily on information technology was adopted by the firms to a medium extent, with a mean value of 3.45 and SD of 1.65. The practice of seamlessly sharing vital information through network technologies was also adopted to a medium extent by the firms, with the mean of 3.42 and SD of 1.71. Storage of vital information with the aid of information technology periods (M=3.31, SD=1.78), use of information technology to integrate all supply chain partners to form a distribution network (Mean=3.38; SD=1.76), and the milk processing firms having competent information technology personnel (Mean=3.29; SD=1.87), showed adoption of distribution information technology to a moderate extent as derived from their means and deviations. Generally, adoption of distribution information technology optimization by fresh milk processing firms in Kenya were adopted to a moderate extent (Mean=3; SD=1.68).

4.4.3 Transport Management

The study wanted to determine the level of adoption of transport management by the fresh milk processing firms in Kenya and the results are presented in table 4.6.

Table 4. 6 Transport Management

Factor	Mean	Std. Dev
The firm practices route planning and scheduling	3.91	1.09
The firm tracks its fleets	3.43	1.55
The firm has distribution centers near the customers to reduce distance of transportation	3.62	1.16
The firm practices reverse logistics	3.54	1.09
The firm frequently service the trucks	3.41	1.99
General score	3.58	1.57

Source: Study Data (2021)

From table 4.6, the firms practicing route planning and scheduling (Mean=3.91; SD=1.09), the firms having distribution centers near the customers to reduce distance of transportation (Mean=3.62; SD=1.16) and those practicing reverse logistics (M=3.54. SD=1.09) indicates that the practices were largely adopted given their mean scores. Tracking of trucks (Mean=3.43; SD=1.55) and frequent servicing of the trucks (Mean=3.41; SD=1.99) were adopted to a medium extent considering the standard deviation and mean scores. The general score indicates that transport management was adopted to a large extent by the fresh milk processing firms in Kenya. This means that the fresh milk processors value transport management with high and it is critical for their performance and hence the level of investment in this area.

4.4.4 Backhaul Management

The study sought to establish the level of backhaul management adoption by the fresh milk processing firms in Kenya and outcome are as displayed in table 4.7.

Table 4. 7 Backhaul Management

Factors	Mean	Std. Dev
The firm's trucks always carry something back after delivery	3.31	1.68
The firm optimizes truck loading upon deliveries	3.50	1.49
The firm collaborates with other firms for efficient transportation	3.43	1.61
The firm collaborates with customers for efficient delivery and returns	3.51	1.49
Aggregate score	3.44	1.62

Source: Study Data (2021)

Table 4.7 indicates that the firm’s trucks always carrying something back after delivery had a mean of 3.31 and standard deviation of 1.68 and the firms collaborating with other firms for efficient transportation recorded a mean score of 3.43 and a standard deviation of 1.61, indicating that both practices were moderately adopted by the fresh milk processing firms in Kenya. Optimization of truck loading upon deliveries (Mean=3.50; SD=1.49) and collaborating with customers for efficient delivery and returns (Mean=3.51; SD=1.49) were both adopted to a large extent by fresh milk processing firms in Kenya. General score indicates that backhaul management was adopted to a moderate extent by the milk processing firms in Kenya.

4.4.5 Omni-channel Distribution Management

The study sought to determine the level of adoption of Omni-channel distribution management by fresh milk processing firms in Kenya and results are as shown in table 4.8.

Table 4.8 Omni-channel Distribution Management

Factors	Mean	Std. Dev
The firm offers a variety of distribution channels	3.33	1.65
The firm has a platform and portal that customers can access products and services	3.52	1.49
The firm delivers products where and when the customers need them.	3.38	1.64
The firm offers a seamless customer experience	3.43	1.56
General score	3.42	1.57

Source: Study Data (2021)

Table 4.8 indicates that offering a variety of distribution channels (Mean=3.33; SD=1.65), delivering of products where and when the customers need them (M=3.38, SD=1.64) and offering of a seamless customer experience (Mean=3.43; SD=1.56) were all adopted to a medium extent as shown by their mean scores and standard deviations. The firm having a platform and portal that customers can access products and services was adopted to a large extent by the milk processing firms in Kenya with a mean of 3.52 and standard deviation of 1.49. The general score shows that omni-channel distribution management was moderately adopted (Mean=3.43; SD=1.57) an indication that the fresh milk processing firms in Kenya did not lay much emphasis on omni-channel distribution management.

4.5 Distribution Network Economy and Logistics Performance

Objective two sought to establish the relationship between distribution network economy and logistics performance of fresh milk processing firms in Kenya. A regression analysis was run and the outcome are presented in the tables below:

Table 4.9 Logistics Performance: Summary of Regression Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.791 ^a	.746	.721	.52124	.746	8.776	5	28	.000

a. Predictors: (Constant), Distribution Network Economy

Source: Study data (2021)

Table 4.9 indicates that R square is 0.746 which when translated is 75% an inference that 75% of the variation in logistics performances of fresh milk processing firms in Kenya is directly accredited to distribution network economy strategies. Analysis of variance is presented in table 4.10.

Table 4.10: Logistics Performance: ANOVA Analysis

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	11.922	5	2.384	8.776	.000 ^b
Residual	7.607	28	.272		
Total	19.529	33			

a. Dependent Variable: Logistics Performance

b. Predictors: (Constant), Distribution Network Economy

Source: Research data (2021)

The results in table 4.10 affirms that there exists a substantial relationship between distribution network economy and logistics performance as evidenced by $0.00 < 0.05$. thus, basing on the level of significance and the p value of 0.03 at 5% significance level, it can be concluded that distribution network collaboration, distribution information technology optimization, transport management, backhaul management and omni-channel distribution management influences logistics performance in terms of timeliness and logistics cost. Regression coefficient outcome is tabulated in below table 4.11.

Table 4.11: Logistics performance: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	5.541	.154		3.312	.000
DN Collaboration	.469	.194	.150	3.126	.039
DIT Optimization	.514	.112	.208	2.471	.014
1 Transport Management	.638	.147	.247	2.582	.001
Backhaul Management	.609	.182	.120	5.075	.032
Omni-Channel Management	.329	.232	.071	4.633	.021

a. Dependent Variable: Logistics Performance

Source: Study data (2021)

The established linear regression equation becomes:

$$Y = 5.541 + 0.469X_1 + 0.514X_2 + 0.638X_3 + 0.609X_4 + 0.329X_5$$

Where;

Y = Logistics Performance

X1= Distribution network collaboration

X2= Distribution information technology optimization

X3= Transport management

X4= Backhaul management

X5=Omni-channel distribution management

From table 4.11, distribution network economy (distribution network collaboration (t=3.126, P<0.05), distribution information technology optimization (t=2.471, P<0.05), transport management (t=2.582, P<0.05) backhaul management (t=5.075, P<0.05) and omni-channel distribution management (t=4.633, P<0.05) all have a positive and significant relationship with logistics performance. The model shows that when all variables (distribution network collaboration, distribution information technology optimization, transport management, backhaul management and omni-channel distribution management) are held at constant, the value of logistics performance would be 5.54.

A unit increase in distribution network collaboration, distribution information technology optimization, transport management, backhaul management and omni-channel distribution management will lead to an increase in logistics performance of fresh milk processing firms in Kenya by 0.469, 0.514, 0.638, 0.609 and 0.329 respectively.

From the above findings, distribution network economy strategies (distribution network collaboration, distribution information technology optimization, transport management, backhaul management and omni-channel distribution management) were found to have statistically significant relationships with logistics performance (logistics cost and timeliness) of fresh milk processing firms in Kenya.

4.6 Discussions and Findings

The study had two objectives; to determine the level of adoption of distribution network economy by fresh milk processing firms in Kenya and; to establish the relationship between distribution network economy and logistics performance of fresh milk processing firms in Kenya. Both objectives of the study were achieved.

On the first objective, it was found that distribution network collaboration was adopted to a large extent by the fresh milk processing firms in Kenya with the mean of 3.61 and standard deviation of 1.37. This outcome aligns with the findings by Schlossberger (2018) who determined that networks formed through collaboration and supported by efficient technology can have a significant impact on product distribution while also aiding in the improvement of a firm's economy and performance. Hulthén and Gadde (2009) determined that for a distribution network to be sustainable, there must be close collaboration between suppliers, supply chain integration, effective information sharing, and investment in technology and information systems.

The outcome indicates that distribution information technology optimization by fresh milk processing firms in Kenya was adopted to a moderate extent (Mean=3.37; SD=1.68). This result contradicts that of Yi et al. (2020) who noted that network optimization technologies offer a podium that makes it possible to collaborate and share information and analyze scenarios which can be capitalized to come up with better decisions and enhanced integration along the chain. Han et al. (2017) adds that information technology optimization enhances visibility along the chain as well as enhancing tactical decision-making and enables firms to react and respond promptly to

interruptions within the network. Li et al. (2020) notes that quick information technological developments has enhanced the obtainability of vital information and as well as the opportunity for information sharing amongst diverse units internally and externally. Hrazhevskaja et al. (2020) demonstrated that digital technologies and the use of information technology heavily influences performance of public administration.

Transport management was adopted to a large extent by the fresh milk processing firms in Kenya. This finding aligns with that of Muhalia et al. (2021) who discovered that transportation management systems had an impact on the supply chain performance of FMCGs. Murphy (2012), notes that transportation management aids in the delivery of time utility to products and ensures that the products are available to customers at the appropriate time and location so that they can be consumed. Baah et al. (2021), opined that transport innovations are crucial in achieving distribution network economy by improving the efficiency of fuel engines, implementing intelligent transportation management systems such as using robots within the warehouse and having automatic guided vehicles, and ensuring that vehicle load is fully utilized.

Backhaul management was adopted to a moderate extent by fresh milk processing firms in Kenya. This outcome contradicts that of Muma et al. (2014) who found that backhaul management allows firms to gain a competitive advantage and minimize shipping costs. Hasan, (2013) notes that backhaul management assists an entity in optimizing truck loading by avoiding empty trips back to the destination, hence making the distribution network economically feasible. Amemba et al., (2013) adds to the argument by saying that backhaul management, enhanced through collaboration and information sharing, combined with adequate planning will assist in reducing unnecessary travel, saving energy and money, and reducing both air and noise pollution.

Lastly, the findings indicate that omni-channel distribution management was moderately adopted (Mean=3.43; SD=1.57) by fresh milk processing firms in Kenya. These findings do not align with Hole, et al. (2019) who found that clients are able to receive the product at their convenience whilst affording the firm a chance to manage their logistics efficiently through an omni-channel distribution management system. Ishfaq et al. (2016) add that omni-channel consumers interchange channels and anticipate a smooth service and better customer experience that entails both in-store and online shopping through a well-managed Omni-channel distribution system.

From the second objective, the findings show that distribution network economy strategies (distribution network collaboration, distribution information technology optimization, transport management, backhaul management and omni-channel distribution management) were found to have statistically significant relationships with logistics performance (logistics cost and timeliness) of fresh milk processing firms in Kenya. These findings are concurrent with those of Baah et al. (2021) who found that the distribution network economy has several advantages such as more visibility, flexibility, and shorter lead times. Mandel and Veetil (2021) listed some gains of a distribution network as minimized costs, enhanced firms growth, loyal and satisfied client base and collaborative alliances with key partners. Opati (2018) observed that efficient distribution network strategies influenced KEMSA's performance. Ustyuzhanina et al. (2018) established that the adoption and embracing of network economy at any level of the organization is bound to result in economic gains. To succeed in the modern global economy, it is essential to have a distribution network that is rich with information, extremely flexible, customer driven and cost effective (Mandel & Veetil, 2021). These new distribution channel structures have been found to improve service delivery, save on cost and enhance customer satisfaction as observed by Zhu and Luo (2021). Proficient logistics and distribution is the optimization and managing of forward and reverse logistics in a chain so as to save time, minimize costs of delivering product as well as to minimize transport impacts on the ecosystem from vendors to the storage facility as concluded by Jabłoński and Jabłoński (2020).

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes the key findings of the study, conclusions based on the findings, recommendations and suggestions for further research.

5.2 Summary of the Study

The study sought to investigate how the distribution network economy impact logistics performance of fresh milk processing firms in Kenya. The objectives were to ascertain the level of adoption of distribution network economy by the fresh milk processing firms in Kenya and to establish the relationship between distribution network economy and logistics performance of fresh milk processing firms in Kenya.

On the first objective, it was established that distribution network collaboration and transport management were adopted to a large extent while distribution information technology optimization, backhaul management and omni-channel distribution management were adopted to a moderate extent by the fresh milk processing firms in Kenya. Distribution network collaboration was largely adopted extent by collaborating with strategic suppliers and key client's, having interdepartmental collaboration, improved coordination and trust amongst all supply chain partners and sharing of best practices with strategic supply chain partners Distribution information technology optimization was adopted to a moderate extent through heavily investing on information technology, seamlessly sharing vital information through network technologies, storing vital information with the aid of information technology, using information technology to integrate all supply chain partners to form a distribution network and having a competent information technology personnel.

Transport management was adopted to a large extent by the milk processing firms in Kenya through route planning and scheduling, having distribution centers near the customers to reduce distance of transportation, engaging in reverse logistics, tracking of trucks and frequently servicing the trucks. Backhaul management was adopted to a moderate extent by fresh milk processing firms, ensuring that trucks always carried something back after delivery, collaborating with other firms for efficient transportation, optimization of truck loading upon deliveries and collaborating with customers for efficient delivery. Omni-channel distribution management was moderately

adopted by offering a variety of distribution channels, delivering of products where and when the customers need them, offering of a seamless customer experience and by having a platform and portal that customers can access products and services.

From the second objective, the findings shows that distribution network economy strategies (distribution network collaboration, distribution information technology optimization, transport management, backhaul management and omni-channel distribution management) were found to have statistically significant relationships with logistics performance (logistics cost and timeliness) of fresh milk processing firms in Kenya given the p value of below 0.05.

5.3 Conclusions

The results of study indicate that distribution network economy significantly and positively influences fresh milk processing firm's logistics performance through minimized logistics costs and enhanced timely service deliveries. It therefore concluded that fresh milk processing firms should adopt distribution network economy strategies (distribution network collaboration, transport management, distribution information technology optimization, backhaul management and omni-channel distribution) if they are to enhance their logistics performance through minimized logistics cost and enhanced timeliness.

Distribution network economy (distribution network collaboration, transport management, distribution information technology optimization, backhaul management and omni-channel distribution) were adopted to different extent levels by the fresh milk processing firms in Kenya. Distribution network collaboration and transport management were adopted to a large extent while distribution information technology optimization, backhaul management and omni-channel distribution was moderately adopted. However, the adoption of distribution network economy, the extent of which was different across the firms, was found to have a positive and significant relationship on logistics performance of fresh milk processing firms in Kenya as shown by their p values which were less than five percent. It is thus concluded that firms which adopt a distribution network economy are bound to enhance their logistics performance.

5.4 Recommendations

It is recommended that fresh milk processing firms should adopt distribution network collaboration as it has been discovered that networks formed through collaboration and supported by efficient

technology can have a significant impact on product distribution while also aiding in the improvement of a firm's economy and performance. Distribution information technology optimization should also be adopted by fresh milk processing firms in Kenya to a larger extent as it has been determined as having been adopted mostly to a moderate extent. This is because network optimization technologies offer a podium that makes it possible to collaborate and share information and analyze scenarios which can be capitalized to come up with better decisions and enhanced integration along the value chain. Information technology optimization also enhances visibility along the chain as well as enhancing tactical decision-making and enables firms to react and respond promptly to interruptions within the network. Managers should also adopt transport management to a very large extent as transportation management aids in the delivery of time utility to products and ensures that the products are available to customers at the appropriate time and location so that they can be consumed.

The study recommends that backhaul management should be largely adopted as it was adopted to a moderate extent by the milk processing firms in Kenya. This is due to the literature that backhaul management allows firms to gain a competitive advantage and minimize shipping costs. As well as assists an entity in optimizing truck loading by avoiding empty trips back to the destination, hence making the distribution network economically feasible. Omni-channel distribution management also needs to be adopted to a large extent by the fresh milk processing firms in Kenya as it has been found that clients are able to receive the product at their convenience whilst affording the firm a chance to manage their logistics efficiently through an omni-channel distribution management system as well as the delivery of smooth service and better customer experience that entails both in-store and online shopping.

Lastly, the study recommends the adoption of distribution network economy strategies (distribution network collaboration, distribution information technology optimization, transport management, backhaul management and omni-channel distribution management) as they have been found to have statistically significant relationships with logistics performance (logistics cost and timeliness).

5.5 Suggestions for Future Research

Future studies should explore reasons as to why some distribution network economy strategies are largely adopted and others adopted moderately. Other distribution network economy strategies that were not covered in this study should also be considered and how they influence the logistics performance established.

Other studies should look into the distribution network economy strategies and their influence on other performance metrics like operations, network design, supply chain agility, supply chain responsiveness or even client satisfaction.

Additional studies should focus on distribution network economy strategies in other sectors – pharmaceutical firms, franchise outlets, retailers or even county governments - and not limit this to milk processing firms in Kenya. The context can also be decentralized from Kenya to the county levels like Uasin Gishu, Trans-Nzoia or Nairobi counties among others.

Drivers or barriers of distribution network economy strategies can also be explored for possible studies.

REFERENCES

- Afshan, N., Chatterjee, S., & Chhetri, P. (2018). Impact of information technology and relational aspects on supply chain collaboration leading to financial performance: A study in Indian context. *Benchmarking: An International Journal*.
- Baah, C., Acquah, I. S. K., & Ofori, D. (2021). Exploring the influence of supply chain collaboration on supply chain visibility, stakeholder trust, environmental and financial performances: a partial least square approach. *Benchmarking: An International Journal*.
- Birachi, E., (2008). Determinants of Coordination and Supply Chain Performance: The Case of Fresh Milk Supply Chains in Kenya. 2006.
- Cai, Y. J., & Lo, C. K. (2020). Omni-channel management in the new retailing era: A systematic review and future research agenda. *International Journal of Production Economics*, 229, 107729.
- Chen, H., Huang, Y., Zhang, S., Yu, H., Tang, C., & Huang, L. (2019). Research on Coordination Planning of Reliability and Economy of Distribution Networks with PV Energy Integration. In *2019 IEEE Sustainable Power and Energy Conference (iSPEC)* (pp. 1268-1272).
- Dubey, R., Bryde, D. J., Foropon, C., Tiwari, M., Dwivedi, Y., & Schiffling, S. (2021). An investigation of information alignment and collaboration as complements to supply chain agility in the humanitarian supply chain. *International Journal of Production Research*, 59(5), 1586-1605.
- Duong, L. N. K., & Chong, J. (2020). Supply chain collaboration in the presence of disruptions: a literature review. *International Journal of Production Research*, 58(11), 3488-3507.
- Durach C., Wieland A., and Straube F. (2014). Trends and strategies in global logistics and supply chain management. <https://www.researchgate.net/publication/288664946> *Economics* 112: 683-699.
- Ferguson, M., Ketzenberg, M.E (2006).: *Information sharing to improve retail product freshness of perishables*, *Production and Operations Management*. 15 (1). 57-73
- Fugate, B. S., Mentzer, J. T. & Stank, T. P. (2011). Logistics Performance: Efficiency, Effectiveness, and Differentiation. *Journal of Business Logistics* 31, 43-61.

- Gu, M., Yang, L., & Huo, B. (2021). The impact of information technology usage on supply chain resilience and performance: An ambidextrous view. *International Journal of Production Economics*, 232, 107956.
- Han, J. H., Wang, Y., & Naim, M. (2017). Reconceptualization of information technology flexibility for supply chain management: An empirical study. *International Journal of Production Economics*, 187, 196-215.
- Hole, Y., Pawar, M. S., & Khedkar, E. B. (2019, November). Omni Channel Retailing: An Opportunity and Challenges in the Indian Market. In *Journal of Physics: Conference Series* (Vol. 1362, No. 1, p. 012121). IOP Publishing.
- Jabłoński, A., & Jabłoński, M. (2020). Creating Sustainability Business Models in the Digital and Network Economy. In *Social Business Models in the Digital Economy* (pp. 139-147). Palgrave Macmillan, Cham.
- Jabłoński, M., Timmers, P., & Sarkis, J. (2020). Sustainability in business models in the network economy. *Electronic Markets*, 30(4), 675-678.
- Kantemirova, M., Dzakoev, Z., Alikova, Z., Chedgemov, S., & Soskiewa, Z. (2018). Percolation approach to simulation of a sustainable network economy structure. *Entrepreneurship and Sustainability Issues*, 5(3), 502-513.
- Kotzé, T., Botes, A., & Niemann, W. (2017). Buyer-supplier collaboration and supply chain resilience: A case study in the petrochemical industry. *South African Journal of Industrial Engineering*, 28(4), 183-199.
- Kumar, G. (2020). Collaboration between supply chain partners: when does it matter? Evidence from collaborative profiles. *Journal of Business & Industrial Marketing*
- Li, C., Zhou, H., Li, J., & Dong, Z. (2020). Economic dispatching strategy of distributed energy storage for deferring substation expansion in the distribution network with distributed generation and electric vehicles. *Journal of Cleaner Production*, 253, 119862.
- Ma, Y. (2020). Financial Sustainable Growth of SUNING Based on the Network Economy Service Platform. In *International Conference on Application of Intelligent Systems in Multi-modal Information Analytics* (pp. 169-174).
- Mandel, A., & Veetil, V. P. (2021). Monetary dynamics in a network economy. *Journal of Economic Dynamics and Control*, 125, 104084.

- Melacini, M., Perotti, S., Rasini, M., & Tappia, E. (2018). E-fulfilment and distribution in omni-channel retailing: a systematic literature review. *International Journal of Physical Distribution & Logistics Management*.
- Metelenko, N., Pashko, L., Grynychuk, N., Vakulenko, V., Babenko, O., & Protsak, K. (2021). Transformation of the System of Public Administration in a Network Economy. *Studies of Applied Economics*, 39(3).
- Mofokeng, T. M., & Chinomona, R. (2019). Supply chain partnership, supply chain collaboration and supply chain integration as the antecedents of supply chain performance. *South African Journal of Business Management*, 50(1), 1-10.
- Monique Murfield, Christopher A. Boone, Paige Rutner, Rodney Thomas, (2017) "Investigating logistics service quality in omni-channel retailing", *International Journal of Physical Distribution & Logistics Management*, Vol. 47 Issue: 4, pp.263-296
- Muhalia, E., Ngugi, P., & Moronge, M. (2021). Effect of Transportation Management Systems on Supply Chain Performance of FMCG In Kenya. *American Journal of Supply Chain Management*, 6(1), 1-12.
- Nderitu, D. M., & Njuguna, R. K. (2017). The influence of retail network expansion on the competitive advantage of oil marketing firms in Kenya: case of Vivo Energy. *International Journal of Sales, Retailing and Marketing*, 6(2), 3-16.
- Ng'ethe, H. W. (2017). *Effects of counterfeits on sales and distribution of pharmaceutical products in Nairobi County, Kenya* (Doctoral dissertation, University of Nairobi).
- Rafi, V., & Dhal, P. K. (2020). Maximization of economy in distribution networks with most favorable placement of distributed generators along with reorganization using hybrid optimization algorithms. *Materials Today: Proceedings*.
- Saghiri, S., Wilding, R., Mena, C., & Bourlakis, M. (2017). Toward a three-dimensional framework for omni-channel. *Journal of Business Research*, 77, 53-67.
- Suray, I., Hrazhevskaya, N., Yakovenko, L., Suprunenko, S., Sabadosh, H., & Gerashchenko, V. (2020). Transformation of public administration in a network economy. *International Journal of Management*, 11(5).
- Ustyuzhanina, E., Evsukov, S., & Komarova, I. (2018). Network economy as a new economic system.

- Vanpoucke, E., Vereecke, A., & Muylle, S. (2017). Leveraging the impact of supply chain integration through information technology. *International Journal of Operations & Production Management*.
- Wamalwa, H., Upadhyaya, R., Kamau, P. and McCormick, D. (2019), "Strategies of Kenyan firms: a case study of food processing firms in Nairobi", *African Journal of Economic and Management Studies*, 10 (4), 507-520.
- Yeniyurt, S., Wu, F., Kim, D., & Cavusgil, S. T. (2019). Information technology resources, innovativeness, and supply chain capabilities as drivers of business performance: A retrospective and future research directions. *Industrial Marketing Management*, 79, 46-52.
- Yi, Z., Xu, Y., Zhou, J., Wu, W., & Sun, H. (2020). Bi-level programming for optimal operation of an active distribution network with multiple virtual power plants. *IEEE Transactions on Sustainable Energy*, 11(4), 2855-2869.
- Yu, Y., Huo, B., & Zhang, Z. J. (2021). Impact of information technology on supply chain integration and company performance: evidence from cross-border e-commerce companies in China. *Journal of Enterprise Information Management*.
- Zhu, X., & Luo, S. (2021). The influence of computer network technology on national income distribution under the background of social economy. *Computer Communications*.
- Zhang, D., Dong, J. & Nagurney, A, (2021). A supply Chain Network Economy: Modeling and Qualitative Analysis. *Innovations in Financial and Economic Networks*

APPENDIX I; QUESTIONNAIRE

Introduction

This questionnaire has been designed for the sole purpose of collecting data on the effect of the Distribution Network Economy on Logistics Performance among Fresh Milk Processing firms in Kenya. The data collected will be treated with a very high degree of confidentiality and it is meant for academic purposes only.

SECTION A: Biographic Information

1. Please state the name of the Fresh Milk Processing firm

.....
.....

2. Please state your job title:

Head of Supply Chain { }
Head of Procurement { }
Head of Operations { }
Head of Logistics and Warehousing { }

3. How long have you worked for your organization?

1 – 2 years { }
3 – 5 years { }
5 -10 years { }
Over 10 years { }

4. For how long has this Fresh Milk Processing firm operated in Kenya?

Less than 5 years { }
5 – 10 years { }
Over 10 years { }

5. Do you collaborate with external partners in your distribution activities?

YES { } NO { }

SECTION B: EXTENT OF ADOPTION OF DISTRIBUTION NETWORK ECONOMY AMONG FRESH MILK PROCESSING FIRMS IN KENYA

6. Please indicate the extent to which you agree with the following statements on the extent of adoption of the Distribution Network Economy in Milk Processing Firms. The scale below will be applicable:

Please rate on a scale of 1 to 5, (where: 1= strongly disagree, 2= disagree, 3= not sure, 4= agree, 5= strongly agree). Tick as appropriate.

Distribution Network Economy Strategy	Rating				
	1	2	3	4	5
COLLABORATION					
We collaborate with our suppliers					
We collaborate with our customers					
We practice interdepartmental collaboration					
We have coordination and trust amongst all supply chain partners					
We share best practices with our supply chain partners					
Collaboration fosters real-time visibility amongst partners					
INFORMATION SYSTEM AND TECHNOLOGY	1	2	3	4	5
We have invested heavily in information technology					
We share vital information through network technologies					
We store vital information with the aid of Information Technology					
Information Technology is used to integrate all supply chain partners to form a distribution network					
TRANSPORT MANAGEMENT	1	2	3	4	5
We practice route planning and scheduling					
We track our fleets					
We have distribution centers near the customers to reduce the distance of transportation					
We practice reverse logistics					
We frequently service our tracks					
We ensure our trucks loads are optimized during deliveries					
BACKHAUL MANAGEMENT	1	2	3	4	5
Our trucks always carry something back after delivery					
We optimize our truck loading					
We collaborate with other firms for efficient transportation					
We collaborate with our customers for efficient delivery and returns					

OMNI-CHANNEL DISTRIBUTION	1	2	3	4	5
We offer a variety of distribution channels					
We have an online platform that customers can access our products					
We deliver products where and when the customers need them					
We offer a seamless customer experience					
OTHERS (Please Specify):					

SECTION C: PERFORMANCE OUTCOMES OF IMPLEMENTING DISTRIBUTION NETWORK ECONOMY

7. The following are some of the Logistics performance outcomes which are experienced by organizations that have implemented the Distribution Network Economy. Please indicate the extent to which the following outcomes are experienced in your organization.

Please rate on a scale of 1 to 5, (where: 1= strongly disagree, 2= disagree, 3= not sure, 4= agree, 5= strongly agree). Tick as appropriate.

Logistics Performance Outcome	Rating				
	1	2	3	4	5
TIMELY DELIVERY					
Customer orders are processed promptly					
Customer orders are delivered on time					
All orders are supplied in full					
LEAD TIME					
Short order processing lead time					
Orders are processed manually					
Short time taken in order replenishment					
LOGISTICS COSTS					
Reduced transportation cost					
Reduced inventory costs					
Full utilization of resources					
Minimized product handling cost					
OTHERS (Please Specify):					

8. Would you recommend the adoption of the Distribution Network Economy to other organizations?

a) Yes { }

b) No { }

If yes, please give a reason:

.....

THANK YOU FOR YOUR RESPONSE

APPENDIX II; LIST OF FRESH MILK PROCESSING FIRMS IN KENYA

1. Aberdare creameries	23. Limani Milk Processors
2. Afrodane Foods Industries	24. Lucky Dairies
3. Aspendos Dairy Limited	25. Meru Dairy Union
4. Bahati Agro Processors Limited	26. Miyanji Dairy Farm
5. Bio Food Products	27. Moi's Bridge Dairy
6. Brookside Dairy Limited	28. Molo Milk
7. Delamere Holdings	29. Mukurwe-ini Wakulima Dairy Ltd
8. Daima	30. New Kenya Cooperative Creameries
9. Delaval	31. New Sameer Agriculture & Livestock
10. Doinyo Lessos Creameries Ltd	32. Njambini Dairy Farmers Cooperative Society
11. Eldoville Farm	33. Oriental dairy
12. Farmers milk Processors	34. Palmhouse dairies
13. Githunguri Dairy F.C.S.	35. Raka Milk Processors
14. Glacier Products	36. Razco Kenya Limited
15. Greenland Dairy	37. Spin knit dairy
16. Happy Cow	38. Stanley & Sons Limited
17. Highland Creamers and Foods Limited	39. Suka Farmers Co-operative Society Ltd
18. Ilara dairies	40. Sunpower Products
19. Kabianga Dairy Limited	41. Superior Highland Dairy
20. Kiambaa D.F.C.S. Ltd	42. Uplands Premium Dairies
21. Kinangop Dairies	
22. Lari Dairy Alliance	

Source; Kenya Dairy Board (2021)