



The Influence of Fourth Party Logistics Services on Performance of Manufacturing Sector in Kenya: A Study in Food and Beverage Manufacturing Firms

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Abstract: *The aim of this study was to establish the relationship between fourth party logistics services and performance of food and beverage manufacturing companies in Kenya. This research study adopted a descriptive and cross-sectional research designs. Data was collected from the food and beverage manufacturing firms using self-administered questionnaires. The data collected was analyzed by use of descriptive and inferential statistics. The findings from the study revealed that freight management, logistics information systems management, customer relations management and product Packaging had a significant influence on the performance of food and beverage processing firms. The study concluded that fourth party logistics through freight management, logistics information system, customer relations management and product Packaging were critical in enhancing the performance of food and beverage processing firms in Kenya. The study recommends that the management of food and beverage processing firms ought to embrace fourth party logistics services by having a freight management framework, enhancing use of logistics information systems, bringing customers on board and embracing effective and innovative ways of Packaging the products in order to gain performance.*

Keywords: *fourth party logistics; firm performance; manufacturing sector; food and beverage manufacturing firms*

I. Introduction

Fourth party logistics as defined by Zhang, Li, Wang, Zhao, and Gao (2022) is a company that manages logistics operations with the use of subcontractors and without running its own trucks on the contract. Putting it in a simple form, a fourth party logistics is a company that manages logistics operations combining and using logistics assets like trucks or warehouses from other operators with none of little its own assets. The term lead logistic provider is used when a major portion of the assets come from the aggregator with supplement coming from other providers (Qian, Fang, Yin, Huang & Li, 2021).

Rao and Young (2015) intimate that fourth party logistics are based on the development of fourth party logistics and it is an extension of fourth party logistics, it provides value added service such as planning, information technology integration, transport planning, order tracking and tracing, logistics consulting, application solution, and financial services. From the logistic company to its consigners, as a logistics company its task is to transport the goods from consigner to consignee, and to be a fourth party logistics provider, logistics need to find ways to build strong relations between themselves and their customers, with the above-mentioned supporting function to reach the highest level of service efficiency that is fourth party logistics are integrated logistics management (Wang, Huang, Ip & Wang, 2021).

The competitive manufacturing environment is one that is rapidly changing as globalization and technology force organizations to constantly seek ongoing improvement in all areas in terms of their knowledge, flexibility and performance (Lau & Zhang, 2016). Logistics, for example, is receiving growing attention as an area in which efficiency and

productivity increases can be made in order to improve customer service and to lower costs (Sahay & Mohan, 2016). However, logistics is often not an area of core competence for many organizations. In order to compete successfully in the dynamic manufacturing environment, organizations are increasingly choosing to focus on their own area of competence and expertise. If this logistics outsourcing is undertaken and managed well, it can hold many benefits for the organization (Kersten, Bemeleit & Blecker, 2016; Buyukozkan, Feyzioglu & Ersoy, 2015; Liker & Choi, 2014; Bedeman & Gattorna, 2017).

The competitive manufacturing environment in the modern world is one that is rapidly changing as globalization and technology force organizations to constantly seek ongoing improvement in all areas in terms of their knowledge, flexibility and performance (Tukamuhabwa, Mutebi & Kwagala, 2021). Logistics, for example, is receiving growing attention as an area in which efficiency and productivity increases can be made in order to improve customer service and to lower costs (Kulkarni, Shaikh, Kurkure & Bagul, 2019; Bourlakis & Bourlakis, 2015).

According to Aloo and Ongwae (2021), the manufacturing industry in East Africa has managed to stay on the competitive edge through acquisition of services of skilled and experienced fourth party logistics service providers such as DHL and Kuenhe Nagel. Some companies perform their logistics services in house while other companies outsource multiple logistics providers for their supply chain management which is not only costly to run but also cumbersome to manage (Aydın, Yörükoğlu & Kabak, 2022). Relationships issues, how to share resources, property rights and confidentiality of the information are some of the issues that have arisen overtime.

In Kenya, companies such as East African Breweries Limited, Kenya Airports Authority, Kenya Pipeline Company use fourth party logistics to coordinate and integrate their supply chain operations. By embracing fourth party logistics, it implies that these companies are aiming at optimizing their core business and ensure continued commitment to innovation and competitiveness. It also implies that the companies want to perfect their supply chain operations and ensure cost-saving, thus opting to contract all their supply chain activities to fourth party logistics providers. According to Kiprono and Alexis (2021), while fourth party logistics is not widely embraced in Kenya, local companies that have opted for fourth party logistics service have continued to thrive in their core business, showing the merit of this type of logistics outsourcing towards enhancing organizational performance.

According to Aloo and Ongwae (2021), while local companies have been slow on embracing fourth party logistics, the fourth party logistics providers have extensively shown most of the companies the need for this type of logistics, as it ensures seamless supply chain process thus enhancing the company's ability to fully focus on core business and achieve more customer satisfaction.

According to KAM (2020), food and beverages is the largest sector in the manufacturing industry comprising of 197 companies contributing 21.92% of the total KAM's membership. According to Kenya Institute for Public Policy Research and Analysis (2019), the manufacturing sub-sector in Kenya constitutes 70% of the industrial sector's contribution to GDP. Chiappinelli (2020) stresses on application of problem-specific approaches on their research, the essential of processes and tasking flexibility measurement as an answer to address the market volatility and to fulfil the diverse customer needs. Manufacturing strategies consists of competitive priorities which mainly focus on effectiveness, cost, delivery, flexibility, innovation and responsiveness (Wang, Huang, Feng & Zhou, 2022). Also competitive priorities have been widely used as part of the measurement for manufacturing strategy performance.

The sector is predominantly agro-processing, with manufacture of food, tobacco, beverages and textile accounting for over 34.0% of total sectoral value added (KIPPRA,

2019). The government's commitment to the realization of Vision 2030 depends on corroborated effort to address the costs of production and other factors contributing to the high cost of doing business (KIPPRA, 2019). The food and beverages industry has a unique role in expanding economic opportunity because it is universal to human life and health (Ngonela, Mwaniki & Namusonge, 2014; Maditati et al., 2022; Mutuku & Moronge, 2020).

The food processing sector can therefore be a key driver of the economic growth and growth in this sector can have a direct and significant impact on the whole Kenya's economy.

Logistics, for example, is receiving growing attention as an area in which efficiency and productivity increases can be made in order to improve customer service and to lower costs (Musau, Namusonge, Makokha & Ngeno, 2017). In this case, a fourth party logistics designs, co-ordinates and executes a supply chain strategy while providing the company with value-added information to better manage core competencies.

1.1 Statement of the Problem

Food and beverage manufacturing firms in Kenya, fourth party logistics saved various firms over Kshs.82 Billion in the financial year (FY) 2018/2019. According to KAM (2020), on the life span of food and beverage manufacturing firms, the firms were winding up at notable percentage indices, fluctuating between 49% and 58%; poor logistics outsourcing was cited as the main reason. Most of these firms operate at a technical efficiency of about 59% compared to their counterparts in South Africa at 70% and Malaysia at about 74% (JDA, 2019). According to KAM (2019), the manufacturing sector has always accounted for over 35% of the country's Gross Domestic Product (GDP), provided employment to about 600,000 people in the formal sector and 2 million persons in the informal sectors of the economy. However, the firms have been experiencing problems in the performance of their production and operations management.

Shale (2015) on the role of fourth party logistics service providers on supply chain performance in distribution firms revealed that 4PL through transport management; inventory management and information flow management significantly influence firm performance.

Kiruja and Ngugi (2019) indicted that value-added services and delivery scheduling are essential fourth and third party logistics services that significantly influence firm performance.

According to Mehmman and Teuteberg (2016), fourth party logistics had no significant effect on firm performance. The available studies have focused on different contexts from this study with scant evidence available on how fourth party logistics affect performance of manufacturing firms in a Kenyan context, thus the motivation of this study.

1.2 Objectives of the Study

1. To assess the main fourth party logistic services outsourced by food and beverage manufacturing firms in Kenya.
2. To examine how the fourth party logistics services influence the performance of food and beverage manufacturing firms in Kenya.

1.3 Justification of the Study

The manufacturing sector is facing turmoil in sustaining its business and strengthening its operational efficiency. Lack of specialization and proper focus on their core mandates exposes the companies to the overwhelming global competition. This leaves the companies with the only option of outsourcing their logistics and other related operations which could ease their load and enhance their specification. However, when outsourcing individual supply chain operations, it becomes another tumult for the manufacturing companies as this means managing other service providers who are not related to the companies' core business. This therefore brings the essence of fourth party logistics, a service provider who handles all the

supply chain operations thus leaving the manufacturing company with the goal of only focusing on the core business. With the growing need for fourth party logistics services among the manufacturing sector, it therefore necessities the study to assess how these service relate to the performance of the manufacturing firms.

II. Review of Literature

2.1 Theoretical Framework

a. The Logistics Theory

This theory was first developed by Mentze (1995) in which he defined logistics as the planning, organization, and control of all activities in the transport flow, from raw material until final consumption and reverse flows of the manufactured product, with the aim of satisfying the customer's and other interest party's needs and wishes that is., to provide a good customer service, low cost, low tied-up capital and small environmental consequences (Liu & Lyons, 2011). Logistics in the manufacturing sector is also defined as those activities that relate to receiving the right product or service in the right quantity, in the right quality, in the right place, at the right time, delivering to the right customer, and doing this at the right cost. To fourth party logistics, the logistics theory presents the link between the parties for gaining the best possible results from logistics cooperation (Herbert *et al.*, 2013). Over time, mutual adjustments improve administrative and logistical systems, making them more efficient. By entering into close cooperation with fourth party logistics providers who possess complementary competencies, the individual firm is able to utilize freight resources and skills controlled by other players.

b. The Partnership Theory

The partnership theory states that any partnership is always based on value and present for each other. The solid and long term relationship simply implies continuous improvement of the organization performance. Partnership model according to Wang, Guo, and Zeng (2021), increases company efficiency through cooperation; both parties obtain cost reduction which leads to price reduction and therefore increasing the customer satisfaction and market share profit margin as well. This leads to a firm gaining a competitive edge and efficiency. The main reasons for partnership are the threat of a central authority, common objectives or self-interest. This threat may be a positive or negative factor. The 17th Century philosopher Hobbes (1651) argued that it was difficult to develop partnership without a strong central authority. In supply chain, the common model through which theorists study the relationship between supplier and buyer is known as the partnership theory (Lee, Rho & Lee, 2013).

2.2 Fourth Party Logistics Services

a. Logistics Information System Management

Logistics information is integral for a seamless logistics process. Fourth party logistic service providers are expected to management the logistics information for the outsourcing company for continued performance of the firms. The flow of accurate and real time information in logistics was considered very important to the flow of materials (Aggarwal & Singh, 2019). This logistics information system explosion had enabled logistics to become an important weapon in the firm's arsenal to add value to the bottom line (Tao et al., 2017). Information sharing was a key to success of logistics performance. According to Radicic (2019), logistics information system had become an important element that reflected collaboration within the logistics management and firm performance (Wardaya, *et al.*, 2013). Before, the logistics information system within the logistics had become vital since it enabled chains to respond on real time and accurate data (Huang, Dong, Kuang, Jiang, Lee, & Wang, 2021). Firms then,

looked at logistics information system as an asset, since it was not possible to have efficient and reliable materials flow without it.

b. Management of Freight

The manufacturing firms have extensive freight which can be tedious to manage while at the same time continuing to focus on the core business. Therefore, fourth party logistics service providers come up with the solution of management freight for the manufacturing companies (Gruchmann et al., 2020). Freight management makes goods and products movable and provides timely and regional efficacy to promote value-added under the least cost principle. In the logistics system, transportation cost could be regarded as a restriction of the objective market (Hong, Xu, Liu, Wu & Pu, 2021).

Freight management is necessary for many industries and services to complete their supply chain and functions. It provides the delivery with speed, lower risk of damage, security, flexibility, accessibility and good frequency for regular destinations, yet the disadvantage is high delivery fee (Fernando & Tew, 2016). Novack and Thomas (2014) said air freight logistics is selected 'when the value per unit weight of shipments is relatively high and the speed of delivery is an important factor'.

c. Product Packaging

Packaging is the science, art, and technology of enclosing or protecting products for distribution, storage, sale, and use. Packaging also refers to the process of design, evaluation, and production of packages (Haffer, 2018). Basic objectives of labeling are brand identification, providing the information and promotion. Food labelling might refer to naming a product or the listing of ingredients. The key objective of a food label is to provide information for the consumer, help sell the product and assist the consumer in making comparable food choices (Achuora, Guyo, Arasa & Odhiambo, 2015). Packaging is the first point of contact with the brand for a consumer product (Ristovska, Kozuharov, & Petkovski, 2017). Packaging design an important issue in the growing use of packaging as a marketing tool for self-service, since approximately 73% of products are sold on a self-service bases at the point of sale. On average, urban supermarkets carry 50 000 items and the typical shopper passes 300 items per minute. The packaging must, therefore, perform many of the sales tasks, including making an overall favorable impression and helping influence impulsive purchasing.

This is in contrast to the secondary function of packaging that is used for storage, shipping and supply chain that consumers do not see but that is still necessary in the distribution of the product to trade (Haffer, 2018).

d. Customer Relations Management

Organizations are obliged to create strong relationship with the customers, whether it is in service industry or in manufacturing industry. According to the service management literature, customer satisfaction is the result of a customer's perception of the service quality relative to the expectation (Mehmann & Teuteberg, 2016). Both the service management and marketing literature suggest that there is a strong relationship between customer satisfaction, customer behavioral intentions (for example, switching and word-of-mouth) and, in turn, profitability (Gautam et al., 2019). The customer relationship management team is vital in determining the amount of flexibility required in order to satisfy the customer (Schramm, Czaja, Dittrich & Mentschel, 2019; Huang, Tu, Chao & Jin, 2019).

Logistic firms' customer relationship management is a comprehensive approach that promises to maximize relationships with all customers, including Internet "e-customers", distribution channel members, and suppliers (Fu, 2017). Ahmed and Zhang (2021) refer to this as maximizing "lifetime customer share", resulting in customer retention and customer

profitability. On the other hand, advanced customer data analysis also allows a company to identify the customers it does not want to serve.

2.3 Fourth Party Logistics Services and Firm Performance

Alnahhal, Tabash, and Ahrens (2021) consider that there are three necessary targets that could be achieved by applying City Logistics: mobility; sustainability; live ability. Mobility is ease of movement, which is the basic requirement for transport of commodities in urban areas.

Goods are supposed to be delivered Just-In-Time. Aggarwal and Singh (2019) addressed a heuristics model to solve forward-reserve allocation problems within the order picking system. Alavi *et al.* (2012) introduced an efficient optimization-based heuristics model based on the real-time information to support the decision-making process of a freight transportation network which resulted in improvement of logistics management and performance of retail firms.

Dewnarain, Ramkissoon, and Mavondo (2019) agree that for satisfaction to affect loyalty, frequent or cumulative satisfaction is required so that individual satisfaction episodes become aggregated or blended. Moreover, it is clear, that he showed strong relationship between customer satisfaction and customer loyalty where, satisfaction is the basic element to determine customer loyalty (Dewnarain *et al.*, 2019). Consumers' requirements for storage, use, and convenience cover, Consumers are constantly seeking items that are easy to handle, open, and reclose, although some consumers want packages that are tamperproof or childproof, also want reusable and disposable packages (Huang *et al.*, 2019; Kulkarni *et al.*, 2010).

2.4 Conceptual Framework

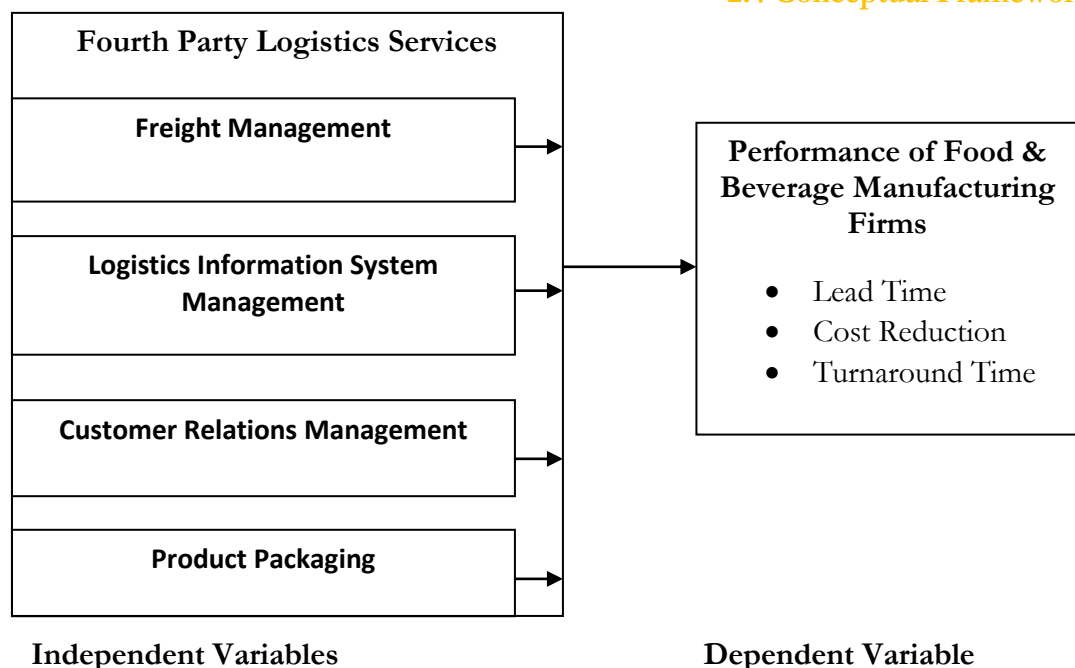


Figure 1. Conceptual Framework

III. Research Methods

This study adopted the descriptive-cross-sectional research design using both quantitative and qualitative approaches. The target population of this study was 197 food and beverages manufacturing companies in Kenya as per KAM (2015). The study used stratified random sampling technique where the subjects were selected in such a way that the existing subgroups in the population are more or less reproduced in the sample. Using a sampling formula, a sample size of 132 respondents was derived. A structured questionnaire was developed to capture the various variables under study, and for the independent variables. The data was analyzed using descriptive and inferential statistics. Descriptive statistics including frequencies, percentages, mean and standard deviations was used in data analysis. A regression analysis was used to test the research hypothesis.

IV. Results and Discussion

4.1 Response Rate of the Study

The study obtained a response rate of 89% which was considered adequate for analysis and making conclusions and recommendations in the study. The demographic results revealed that most of the firms had been in operation for a period of over ten years, and majority dealt with between one and seven products. The results implied that the firms surveyed were diverse and a good representational of the food and beverage manufacturing sector in Kenya.

4.2 Fourth Party Logistics Services Embraced by Manufacturing Firms in Kenya

The study sought to assess the fourth party logistics services embraced by the food and beverage manufacturing firms in Kenya. The study sought to assess the respondents' views on the extent to which they embraced key fourth party logistics services outlined in the literature review.

a. Management of Freight

The respondents were asked to indicate how effective freight management was upheld in their respective organizations. As the findings in Figure 2 reveal, 28% of the respondents indicated that freight management was very effective in their respective companies. The findings indicate that there are a significant number of food and beverage processing firms that are yet to uphold freight management systems in their logistics. The findings are in line with those by Ketokivi, and Schroeder (2014) who established that freight management in the manufacturing sector was an essential supply chain driver that streamlined and enhanced the management of the logistics thus enhancing firm performance.

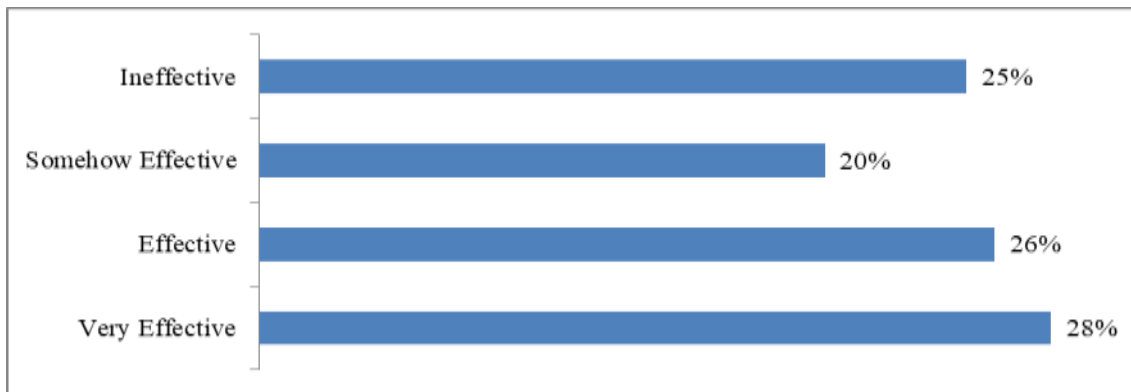


Figure 2. Adoption of Freight Management

b. Logistics Information System Management

The study sought to establish the extent to which the surveyed firms had upheld logistics information system management. Figure 3 summaries the findings. The findings imply that still a significant number of the food and beverage firms surveyed had not effectively upheld logistics information system management which could mean poor management of their fourth party logistics thus affecting their performance. This also compares with what has been indicated Fabbe-Costes, Jahre, and Roussat (2014) that integrating logistics information systems management is a core function in fourth party logistics that steers the flow of information and how logistics are effectively delivered for continued customer satisfaction and organizational performance.

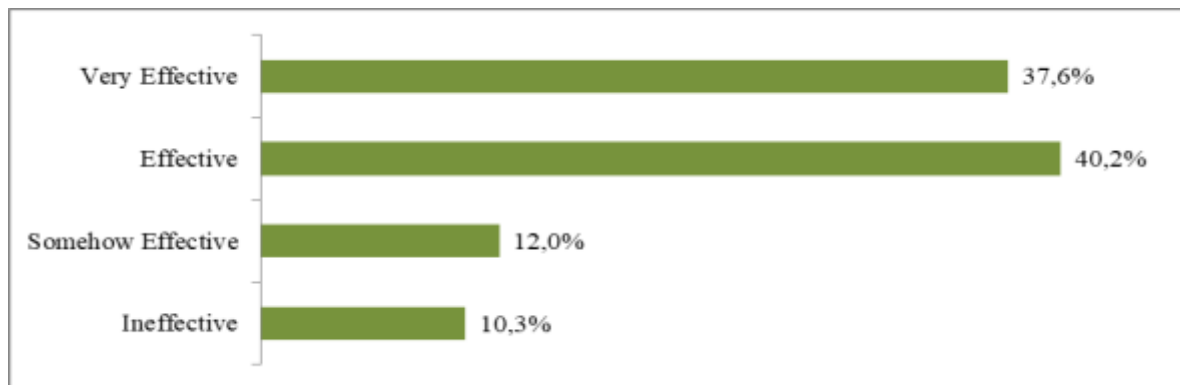


Figure 3. Embrace of Logistics Information System Management

c. Customer Relations Management

The study sought to establish the extent to which customer relations management was upheld in the surveyed food and beverage manufacturing firms. Figure 4 summarizes the findings.

The findings compare with those by Buyukozkan *et al.* (2015) who alluded that upholding customer relations in a fourth part logistics is essential in promoting the performance of the supply chain and enhancing the competitiveness of modern organizations.

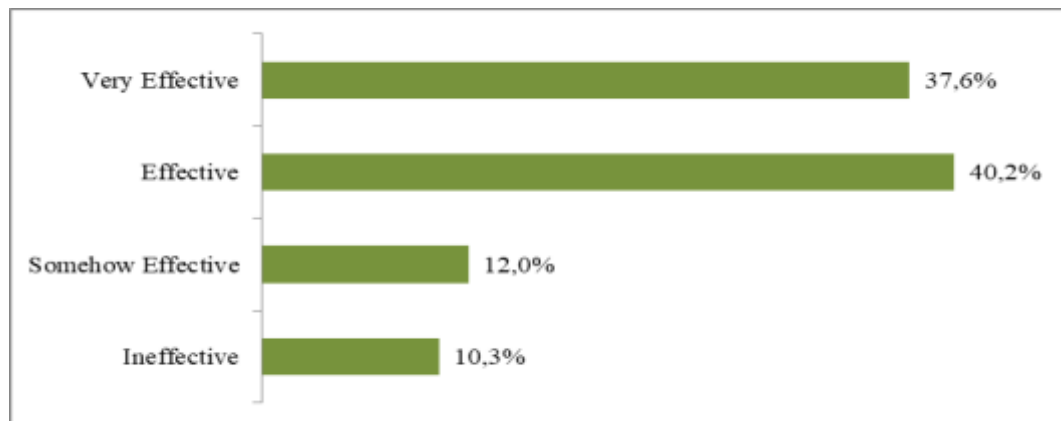


Figure 4. Upholding Customer Relations Management

d. Product Packaging

The respondents were asked to rate the extent to which product packaging was effectively embraced in their respective organizations. As the findings in Figure 5 portray, it can be depicted that while a good number of the food and beverage processing firms upheld product Packaging, there was a significant number of firms that did not uphold the aspect which could affect their performance. This compares with the argument by Lieb and Butner (2013) who

established that logistics management is about ensuring that the right products get to the customers and this can be obtained through continued improvements in product designing and labelling.

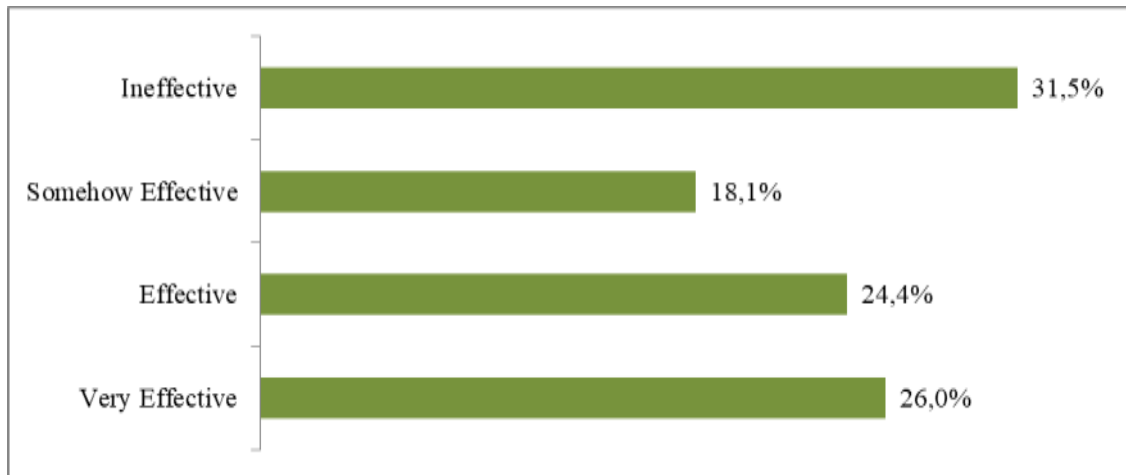


Figure 5. Effectiveness of Product Packaging

4.3 Role of Fourth Party Logistics Services in Influencing Performance of Food and Beverage Manufacturing Firms

The study carried out a multivariate regression model analysis to establish the combined effect of the fourth-party logistics aspects (Product Packaging, Customer Relations Management, Freight Management, Logistics Information System Management) on the performance of food and beverage processing firms in Kenya. The findings are shown in Table 1. From the findings, it can be depicted that the fourth party logistics services have a significant influence on the performance of the manufacturing firms in Kenya. A unit change in freight management influences up to 31.1% of the performance of food and beverage manufacturing firms in Kenya. A unit change in logistics information system management on the other hand influences up to 14% of the performance of food and beverage manufacturing firms in Kenya while a unit change in customer relations management influences up to 24.4% of the performance of food and beverage manufacturing firms in Kenya. A unit change in product Packaging influences up to 25.9% increase in the performance of food and beverage manufacturing firms in Kenya.

Table 1. Regression Model Results

	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	.093	.135		.687	.494
1	Freight Management	.311	.041	.390	7.658	.000
	Logistics Information System Management	.140	.052	.141	2.702	.008
	Customer Relations Management	.244	.031	.370	7.957	.000
	Product Packaging	.259	.036	.357	7.140	.000
R =		.892	R-Square (R ²) =		.795	F = 108.447

a. Dependent Variable: Firm Performance

V. Conclusion

5.1 Conclusion of the Study

Based on the study findings, the study concluded that freight management influences performance. Freight management has significant influence on performance of food and beverage manufacturing firms in Kenya. The sub-constructs of freight management that is tracking and tracing system, fuel management systems, fleet scheduling and routing influences performance positively.

The study concluded that logistics information system management has significant influence on performance of food and beverage manufacturing firms in Kenya. The sub-constructs of logistics information system management that is database design and management, inventory management system and supply and production management systems influence performance positively.

The study also concluded that customer relations management have a significant influence on performance of food and beverage manufacturing firms in Kenya. The sub-constructs of customer relations management namely customer feedback channels, customization and value addition of products, product returns and recalls management influence performance positively.

Based on the study findings, the study concluded that product packaging and labelling have a significant influence on performance of food and beverage manufacturing firms in Kenya. The sub-constructs of product packaging and labelling that is protective and attractive pack designs, illustrative, descriptive label, and clear consistent branding influence performance positively.

5.2 Recommendations of the Study

The study recommended that the management of manufacturing firms in Kenya should put in place freight management strategies as it leads to high performance. The firms should ensure they have a tracking and tracing system, fleet scheduling and routing and fuel management system in the company. The study also recommends that future scholars and researchers should aim to test the relationship between freight management and performance using different sub constructs apart from tracking and tracing system, fleet scheduling and routing and fuel management.

It is recommended that manufacturing firms in Kenya should have an improved logistics information system management system as it leads to high performance. The firms should have a database design and management, an inventory management system and a supply and production management systems.

Based on product packaging and labelling, the study recommended that manufacturing should put in place strategies to have product packaging and labelling as it has a positive effect on performance. The firms should encourage and put in place measures that promote protective and attractive designs, illustrative and descriptive label, clear and consistent branding as they influence performance positively.

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