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LOGISTICS MANAGEMENT AND OPERATIONAL EFFICIENCY OF FOOD AND BEVERAGE FIRMS IN PORT HARCOURT

Ifekanandu Chukwudi Christian[1], Ihuoma Chukwudi Ifekanandu[2],

Rennner Blessing Awaji-ima (Ph.D.)[3] and Lawrence Tochukwu Obalum (Ph.D.)[4]

[1]University of Nigeria (UNN) Business School, Enugu Campus, Enugu State, Nigeria.
Email: chukwudiifekanandu12@gmail.com

[2]National Open University of Nigeria
Email: chukwudiifekanandu12@gmail.com

[3]Ignatius Ajuru University of Education, Port Harcourt, Rivers State Nigeria.
Email: blessboyrenner@gmail.com, Tel.: 07063290865

[4]Relationship Manager, Commercial Banking Division, Access Bank Plc
Email: lobalum@gmail.com

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ABSTRACT: *This study examined the relationship between logistics management and operational efficiency of Food and Beverage Firms in Port Harcourt. Two objectives, two research questions and two hypotheses were formulated to guide the study. This study is anchored on the positivist research paradigm; this study adopted the correlation survey research. The population of the study comprised 30 food and beverage firms in Port Harcourt. Based on the population of the study, which is 30 food and beverage firms, the study adopted a census approach with a focus on the staff (inventory manager, distribution manager and warehousing manager). To ascertain the respondents, the questionnaire was distributed in batches of three (3) copies per headquarter branch. A total of ninety (90) copies of the questionnaire were distributed. Copies of the questionnaire were administered and distributed to the management staff of food and beverage firms in Port Harcourt. The reliability of the study was tested using the Cronbach Alpha method. The study employed the Spearman Rank-order Correlation Coefficient for testing the various hypotheses formulated for the study. The findings of the study established that transport management showed a positive and significant relationship with operational efficiency of food and beverages firms in Port Harcourt. It also confirmed that inventory management showed a positive and significant relationship with operational efficiency of food and beverages firms in Port Harcourt. It was concluded that logistics management is a precursor to operational efficiency of food and beverages firms in Port Harcourt. The study recommends that foood and beverage firms should incorporate transport management (vehicle scheduling and route planning) in their operations processes and inventory management should be enhanced as it will help to improve productivity within the organization.*

KEYWORDS: Logistics Management; Inventory Management Transport Management and Operational Efficiency.

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INTRODUCTION

The importance of logistics management in the food and beverage sector cannot be overemphasized; logistic management is key to effective distribution of beverage products. Across the world, logistics has advanced from the simple concept of warehousing and transportation to become a strategic function in many companies (Barani, 2021). Logistics encompasses all of the information and material flows throughout an organization. It includes everything from the movement of a product or from a service that needs to be rendered, through to the management of incoming raw materials, production, the storing of finished goods, its delivery to the customer and after-sales service (Ittmenn & King, 2010).

Awino (2011) stated that one of the ways of improving efficiency in manufacturing firms was to improve logistics performance. That is why if manufacturing firms need to become efficient and flexible in their manufacturing methods, they need different strategies to manage the flow of goods from the point of production to the end user (Awino, 2011). Brady and Allen (2006) stated that operational efficiency is "the continuous improvement of processes, systems, and activities to maximize productivity and minimize waste, resulting in enhanced performance and value for the organization."

Previous studies on logistics management have revealed mixed findings on how logistics management impacted efficiency. The study of Abdul et al. (2019) on the impact of logistics management on organizational performance revealed that transportation management affects organizational effectiveness with a R2 value of 0.769; that there is a strong relationship between information flow management and employees' efficiency, with a R2 value of 0.923; and that there is a strong relationship between inventory management and organizational productivity, with a Pearson correlation value of 0.859. Similarly, the study of Barani (2021) revealed that transportation, inventory, and warehouse management had positive and statistically significant effects on organizational performance. However, the study of Fekadu (2013) on logistics practice in Ethiopia revealed that the logistics system has poor practices, lack of coordination of goods transport, inadequate transportation vehicles in numbers, quality deterioration of goods while handling, transporting and storage. It is on the premise that this study was made to examine the relationship between logistics management and operational efficiency within the food and beverage sector in Port Harcourt.

Conceptual Framework

The conceptual framework shows the link between logistics management and operational efficiency.

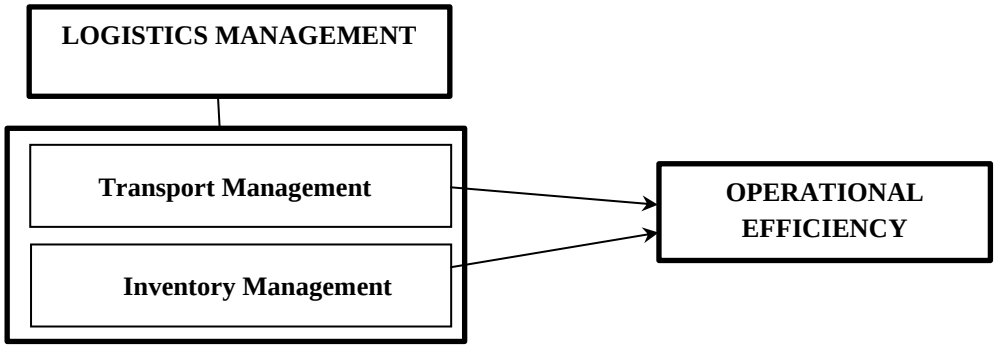

Figure 1.1: Conceptual framework of logistics management and operational efficiency.
Sources: *Abdul et al. (2019); Edim and Inyang (2022).*

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Aim and Objectives of the Study

The aim of this study was to examine the relationship between logistics management and operational efficiency of Food and Beverage Firms in Port Harcourt. The specific objectives of the study were to:

i. determine the relationship between transport management and operational efficiency of Food and Beverage Firms in Port Harcourt.

ii. examine the relationship between inventory management and operational efficiency of Food and Beverage Firms in Port Harcourt.

Research Questions

To address the objectives of the study, the following questions were raised and answered:

i. What is the relationship between transport management and operational efficiency of Food and Beverage Firms in Port Harcourt?

ii. What is the relationship between inventory management and operational efficiency of Food and Beverage e Firms in Port Harcourt?

Research Hypotheses

The following hypotheses were formulated and tested:

Ho_1: There is no significant relationship between transport management and operational efficiency of Food and Beverage Firms in Port Harcourt.

Ho_2: There is no significant relationship between inventory management and operational efficiency of Food and Beverage Firms in Port Harcourt.

REVIEW OF RELATED LITERATURE

Theoretical Review

The study was anchored on the coordination theory. The coordination theory is a body of principles about how activities can be coordinated, that is, about how actors can work together harmoniously (Hewitt, 1986). There are theories, concepts, and results from many different fields that could both contribute to and benefit from the development of such general theories. For instance, it is clear that questions about how people coordinate their activities are central to parts of organization theory, sociology, social psychology, anthropology, linguistics, law, and political science. Important parts of economics and management science also analyze how people can coordinate their work with a special focus on rational ways of allocating resources (Miller et al., 1988). Smith (1981) explains that in the coordination theory, the common problems have to do with coordination: How can overall goals be subdivided into actions? How can resources be allocated among different actors? How can information be shared among different actors to help achieve the overall goals? In its attempts to find generalizations that apply across disciplines and across levels of analysis, coordination theory resembles earlier work on systems theory and cybernetics. Many researchers agree that the major components of coordination include goals, activities, actors and interdependencies (Huberman, 1988).

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It is worth noting that Logistics management involves fulfilment of various organizational goals, by performing several activities (inbound logistics, outbound logistics, warehousing, distribution, materials handling, etc) so as to serve the customers profitably. Such logistic activities are interdependent and they have to be well coordinated for the firm to succeed.

Conceptual Review

Concept of Logistics Management

Logistics is the process of planning, implementing and controlling procedures for the efficient and effective transportation and storage of goods including services and related information from the point of origin to the point of consumption for the purpose of conforming to customer requirements, and it includes inbound, outbound, internal and external movements (Lambert & Stock, 2008). Logistics management is a subset of supply chain management which is involved in planning, executing and controlling the seamless and timely flow as well as storage of products, services and relevant information from source or origin to the place of consumption in order to satisfy the requirements of customers (Amin & Shahwan, 2020). To Abdul et al. (2019), logistics management is a supply chain management component that is used to meet customer demands through the planning, control and implementation of the effective movement and storage of related information, goods and services from origin to destination. Logistics management helps companies reduce expenses and enhance customer service. (Fugate et al., 2010).

Logistics encompasses all of the information and material flows throughout an organization. It includes everything from the movement of a product or from a service that needs to be rendered, through to the management of incoming raw materials, production, the storing of finished goods, its delivery to the customer and after-sales service (Ittmenn & King, 2010). The commonality of the recent definitions in logistics is that it is a process of moving and handling goods and materials, from the beginning to the end of the production, sale process and waste disposal, to satisfy customers and add business competitiveness (Tseng et al., 2005).

Dimensions of Logistics Management

Inventory Management

Stevenson (2009) defines an inventory as a stock or store of goods. The objective of inventory management is to determine and maintain the lowest inventory levels possible that will meet the customer service policy stipulated in the customer service policy (Ensermu, 2013). Either way, any company that sells goods likely has the material necessary to sell their products as well as finished products on hand. These materials and finished products kept on hand are the company's inventory. Inventory is central to the success of commercial enterprises because it is required for the effective execution of commercial operations necessary for profit maximization, hence the need for inventory to be intently managed by companies.

According to Kritchanchai and Meesamut (2015), inventory management is the around-the-clock planning, coordinating and control of raw materials, work-in-progress and finished goods to ensure the availability of optimal inventory while guarding against overstocking, understocking and unexpected stock-out. According to Hedrick (2008) stocks must be well managed in order to increase profits and many small businesses cannot take up the types of losses arising from poor inventory management. Obviously, inventory management is vital to

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business and logistics success. Without proper inventory management, a company can miss potential sales or can lock up too much money in the inventory and miss other opportunities to make money. Value is added through inventory control because goods have more value to a company (or seller) when they are worth more to a customer (buyer). Therefore, if a company has great demand for their product but does not have enough products in inventory, then these potential sales cannot take place and the company misses the opportunity to make money.

Harrison and Hoek (2008) put forward inventory reduction strategies such as: reduction of production lead times, product postponement, total cycle time, compression, centralization of inventory and the virtual warehousing concept.

Transport Management

Transportation is defined as the activities involved in shipping any goods or finished products from suppliers to a facility or to warehouses and sales locations (Kirui & Nondi 2017). The overall purpose of transportation is to connect sourcing locations with customers at lowest possible cost within the constraints of customer service policy (Ensermu, 2013). This entails that effective and efficient logistics management operations cannot be achieved without a reliable and functional transportation management system that could easily be activated as and when needed. Transportation management is the process of managing the movement of input materials into a firm as well as the onward movement of finished products and services from the firm to places of consumption in order to satisfy customers' requirements (Speranza, 2018).

Nyaberi and Mwangangi (2014) explained that the movement of goods from the point of production to the point of consumption is done through various modes of transportation. Depending on the transportation load, number of delivery points, existing distribution centres, product value, frequency of delivery, urgency and the cost economics, different types of networks are used.

Operational Efficiency

Operational efficiency is seen as the few methods and techniques used to achieve the essential goal of conveying quality products and services to clients within the most cost-effective and opportune way (Neil, 2019). Additionally, Brady and Allen (2006) stated that operational efficiency is "the continuous improvement of processes, systems, and activities to maximize productivity and minimize waste, resulting in enhanced performance and value for the organization." It involves optimizing resources, including labor, capital, technology and time to achieve desired outcomes without waste. Sathye (2005) opined that operational efficiency is the effective and judicious use of people, and required machinery or equipment, proper tools, expected materials, and funds for the achievement of organizational goals and objectives. Better use of any one of these, or a combination of them, can boost output and lower costs for goods and services. Kim and Kim (1997), cited by Mboma (2006), posted that operational efficiency is the strategic planning done by a company to ensure a favourable ratio of costs to output. It deals with reducing waste and optimizing resources to offer clients better services. The ability of a firm to offer goods or services promptly to its esteemed customers in the most economical way feasible while maintaining the high quality of its goods, services, and support is known as operational efficiency.

Operational efficiency is the key determinant of the long-term dissolvability of businesses (Ndolo, 2015). In reality, micro-economic or firm-specific indicators of corporates' monetary

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health evolve around operational efficiency (Ndolo, 2015). In tandem with the opinion of Ndolo (2015), it is hypothesized that progressing operational efficiency has a direct effect on the profit margins of organizations. Operational efficiency is frequently accomplished by streamlining firms' center operations with the purpose of viably reacting to persistently changing market forces in a more cost-effective way. In other words, firms can achieve operational efficiency by decreasing repetition and squandering while leveraging their assets that contribute generally to their victory and additionally, utilizing the best of their workforce, innovation and business operations. Decreased inner costs that result from operational efficiency assist firms to be more effective in profoundly competitive markets, in this manner accomplishing higher profit margins. The association between operational efficiency and firms' financial performance has been broadly considered (Vangie, 2019).

Empirical Review

Inventory Management and Operational Efficiency

Ristovska et al. (2017) conducted a study to explore the impact of logistics management strategies on the performance of manufacturing companies. The study used a structured questionnaire to elicit primary data from 352 personnel of manufacturing companies in Macedonia. The hypotheses developed for the study were tested using multiple regression analysis. Consequently, the study found that inventory management, storage and warehousing management, transportation management and information management had significant positive impacts on the performance of Macedonian manufacturing companies. Additionally, Fugate et al. (2010) conducted a study on logistics performance and its influence on firm performance in the USA on 150 firms. The study revealed increase in logistics efficiency, effectiveness, and differentiation decreased expenses, inventory, cash requirements and increased inventory availability, timely delivery, on-time and damage-free deliveries, line-item fill rates and sales which improved net margin, and asset turnover which improved return on assets and overall firm performance. Also, Liu and Luo (2008) examined the effect of logistics capabilities on performance in manufacturing firms in China. The study was based on a survey of 1000 manufacturing firms in central south, south and central China regions. By exploratory and confirmatory factor analyses, the scale of manufacturing firms' logistics capabilities is obtained. The results show that logistics capabilities can be conceptualized as a three dimensional construct: process capability, flexibility capability and information integration capability.

Transport Management and Operational Efficiency

Abdul et al. (2019) used a survey questionnaire to obtain primary data from 115 personnel of Dangote Flour Mills in Ilorin. Data analysis was done using Pearson's Product Moment Correlation statistics and regression analysis. The study found that transportation management, information flow management, and inventory management had significant positive influences on organizational performance of Dangote Flour Mills. Similarly, Chala (2021) carried out a study in which a structured questionnaire was used to obtain primary data from 190 factory workers. Data analysis was done using descriptive statistics, Pearson's correlation and multiple regression analysis. The study found that transportation management, inventory management, and warehouse management had significant positive effects on organizational performance in Ethiopia. Also, Edim and Inyang (2022) explored logistics management and marketing performance of small- and medium-sized manufacturing firms. It aimed to assess the influence

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of order processing, transportation, inventory and warehouse management on the marketing performance of small and medium-sized manufacturing firms. As a cross-sectional study, primary data were obtained from 216 operators and personnel of small- and medium-sized manufacturing firms using a structured questionnaire. The research instrument was validated through the face and content validity method, while reliability was confirmed through Cronbach's alpha method. The hypotheses developed for the study were tested using multiple linear regression. Consequently, the study revealed that order processing management, transportation management, inventory management and warehouse management had significant positive influences on the marketing performance of small- and medium-sized manufacturing firms.

METHODOLOGY

This study is anchored on the positivist research paradigm; this study adopted the correlation survey research. Correlation survey research is a non-experimental research in which the researcher measures two variables and assesses the statistical relationship between them. The population of the study comprised 30 food and beverage firms in Port Harcourt, culled from www.directory.org.ng. Based on the population of the study, which is 30 food and beverage firms, the study adopted a census approach with a focus on the staff (inventory manager, distribution manager and warehousing manager). To ascertain the respondents, the questionnaire was distributed in batches of three (3) copies per headquarter branch. A total of ninety (90) copies of the questionnaire were distributed. Copies of the questionnaire were administered and distributed to the management staff of food and beverage firms in Port Harcourt. The reliability of the study was tested using the Cronbach Alpha method, the result stood at 0.87 higher than the benchmark of 0.70. The study employed the Spearman Rank-order Correlation Coefficient for testing the various hypotheses formulated for the study with the aid of the Statistical Package for Social Sciences (SPSS) Version 23.0.

DATA ANALYSIS AND PRESENTATION

Questionnaire Distribution and Retrieval

No. of Questionnaire Issued	No. of Questionnaire Returned	Useful Questionnaire	%
90	85	80	88

Source: ***Survey Data, 2024.***

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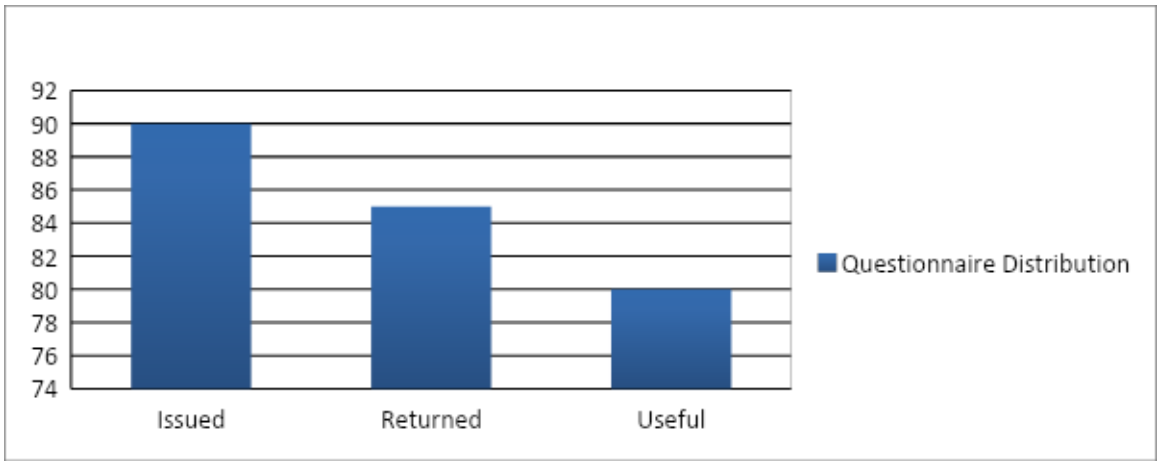

The table and the figure above show the questionnaire distribution and retrieval. The researcher issued 100 copies of the questionnaire and from consistent visits, retrieved 88 copies out of which 80 were useful. This represents 88% response rate and it was considered significant for the study.

Demographic Analysis

The demographic variables of the respondents were presented and analyzed in this section. The demographic variables include age and gender of the respondents.

Gender		**Frequency**	**Percent**	**Valid Percent**
Valid	**MALE**	57	71	71
	FEMALE	23	29	29
	Total	80	100.0	100.0

Source: *Field Survey, 2024.*

The table above shows the gender distribution of the respondents used for the study. Fifty-seven (57) respondents, which represent 71 % of the populations were males while the remaining 23 respondents, which represent 29 %, of the population were females.

Bivariate Analysis

Here, the variables were analyzed using Spearman Rank-order Correlation Coefficient.

Hypothesis 1

Ho_1: There is no significant relationship between transport management and operational efficiency of food and beverages firms in Port Harcourt.

			transport management	operational efficiency
Spearman (rho)	transport management	Correlation Coefficient	1.000	.633**
		Sig. (2 tailed)	.	.001
		N	80	80
		Correlation Coefficient	.633**	1.000
		Sig. (2 tailed)	.001	.

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	operational efficiency	N	80	80

**Correlation is significant at 0.01 levels (2 tailed)

*Correlation is significant at 0.05 levels (2 tailed)

Source: *SPSS-Generated Output*

The result of bivariate analysis carried out between transport management and operational efficiency of food and beverages firms in Port Harcourt shows that transport management has a strong positive correlation with operational efficiency of beverage firms (rho = .633**) and this correlation is significant at 0.01 level, as indicated by the symbol **. As a result of this, we then reject the null hypothesis (Ho_1) and accept the alternate hypothesis which states that there is a strong positive and significant relationship between transport management and operational efficiency of food and beverages firms in Port Harcourt.

Hypothesis 2

Ho_2: There is no significant relationship between inventory management and operational efficiency of food and beverages firms in Port Harcourt.

			inventory management	operational efficiency
Spearman (rho)	Inventory management	Correlation Coefficient	1.000	.681**
		Sig. (2 tailed)	.	.001
		N	80	80
	Operational efficiency	Correlation Coefficient	.681**	1.000
		Sig. (2 tailed)	.001	.
		N	80	80

**Correlation is significant at 0.01 levels (2 tailed)

*Correlation is significant at 0.05 levels (2 tailed)

Source: *SPSS-Generated Output*

The result of bivariate analysis carried out between inventory management and operational efficiency of food and beverages firms in Port Harcourt indicates that inventory management is strongly and positively correlated to operational efficiency of beverage firms (rho = .681**) and the symbol ** signifies that this correlation is significant at 0.01 level. Based on this result, the null hypothesis (Ho_2) is rejected and the alternate hypothesis is accepted. This means that we then accept that there is a strong positive and significant relationship between inventory management and operational efficiency of food and beverages firms in Port Harcourt.

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SUMMARY OF FINDINGS

i. There is a significant relationship between transport management and operational efficiency of food and beverages firms in Port Harcourt.

ii. There is a significant relationship between inventory management and operational efficiency of food and beverages firms in Port Harcourt.

DISCUSSION OF FINDINGS

From the analysis carried out, it was discovered that transport management showed a positive and significant relationship with operational efficiency of food and beverages firms in Port Harcourt. This finding is supported by the study of Abdul et al. (2019) who submitted that transportation management had significant positive influences on organizational performance of Dangote Flour Mills, and also Musau et al. (2017) who concluded that Transport Management has a significant effect on organizational performance which is measured by effectiveness.

Again, the analysis revealed that inventory management showed a positive and significant relationship with operational efficiency of food and beverages firms in Port Harcourt. This finding is supported by the study of Anichebe and Agu (2013) who concluded that there is a significant relationship between good inventory management and organizational productivity.

The third hypothesis was able to measure the impact of information flow management on Employees efficiency. Also, Ristovska et al. (2017) conducted a study to explore the impact of logistics management strategies on the performance of manufacturing companies. The study found that inventory management, storage and warehousing management, transportation management and information management had significant positive impacts on the performance of Macedonian manufacturing companies.

CONCLUSION

This study examined the relationship between logistics management and operational efficiency of Food and Beverage Firms in Port Harcourt. The study established that transport management showed a positive and significant relationship with operational efficiency of food and beverages firms in Port Harcourt. It also confirmed that inventory management showed a positive and significant relationship with operational efficiency of food and beverages firms in Port Harcourt. It was concluded that logistics management is a precursor for operational efficiency of food and beverages firms in Port Harcourt.

RECOMMENDATIONS

In line with the findings and conclusion, the study recommends that:

1) Food and beverage firms should incorporate transport management (vehicle scheduling and route planning) in their operations processes.

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2) Inventory management should be enhanced as it will help to improve productivity within the organization.

3) Various inventory management strategies such as just-in-time (JIT) should be used to manage the stocks that are kept in storage, increase efficiency, and decrease waste by receiving goods only as they need them for the production process.

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