

ORDER MANAGEMENT AND OPERATIONAL EFFICIENCY OF FOOD AND BEVERAGE FIRMS IN RIVERS STATE

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Abstract

The study investigated the relationship between order management and operational efficiency of food and beverages firms in Rivers State. Order management was used as the predictor variable and was treated unidimensionally, while operational efficiency was the criterion variable and was measured using cost reduction, shorter lead time and reduced energy consumption. The study adopted explanatory research with a correlational investigation type. The population of the study consisted 30 food and beverage firms in Rivers State. Given the small population size, a census was taken. 3 copies of questionnaire were administered to the supply chain manager, operations manager and sales/distribution manager of the 30 food and beverage firms. Pearson Product Moment Correlation was used to test the hypotheses with the aid of Statistical Packages for Social Science (SPSS) version 25.0. Analytical outcomes revealed positive and statistically significant relationship between order management and measures of operational efficiency. Thus, the study concluded that order management has significant relationship with operational efficiency of food and beverages firms in Rivers State; and recommends that managers of food and beverage firms in Rivers State that seek improved operational efficiency should adopt order management to enhance cost reduction, shorter lead time and reduced energy consumption.

Keywords: Cost reduction, operational efficiency, order management, shorter lead time, reduced energy consumption

Introduction

Food and beverage distributors play an important role in ensuring the availability of essential consumer goods, hence, contribute significantly to economic growth and employment (Kumar & Reinartz, 2018). As a link between manufacturers and retailers, distributors facilitate efficient movement of perishable and non-perishable goods to meet growing consumer demand (Arumugam et al., 2024). However, the increasing demand for food and beverages in Rivers state necessitates an efficient order management that enhances accuracy, reduces lead time, and optimizes resource utilization (Okongwu et al., 2012; Geminarqi & Purnomo, 2023).

Many food and beverage distributors in Rivers State still struggle with inefficiencies in order management, leading to delays, increased costs, and resource wastage. According to Mohamed (2024), poor order management disrupts operational performance, resulting in financial losses and competitive disadvantages. Given the perishable nature of food products, delayed deliveries and inefficient resource use further worsen this problem (Oyeyemi et al., 2024). Studies have shown that businesses with poor order management experience higher costs and reduced efficiency (Chopra & Meindl, 2022; Lehtimäki, 2021).

The ability of a business to deliver products using minimal resources without compromising quality has become central to organizational discourse due to increased attention sustainability concerns (Sachdeva, 2024; Green et al., 2023). This is because companies have come to terms with the reality that ineffective order management not only inflates costs but also causes delays that can lead to lost sales and dissatisfied customers. This is even as excessive energy usage in processing and logistics contributes to environmental and financial burdens.

Earlier studies give insight on the role of order management in enhancing operational efficiency (Samuel & Izebua, 2023; Siagian et al., 2022; Lehtimäki, 2021; Jepherson et al., 2021; Sarite et al., 2018), but to the best of our knowledge, none of these studies investigated the relationship between order management and operational efficiency in the context of food and beverage distributors in Rivers State. Therefore, this study seeks to contribute to literature by investigating the relationship between order management and operational efficiency of food and beverage distributors in Rivers State. The conceptual framework of this study is shown in Figure 1 below.

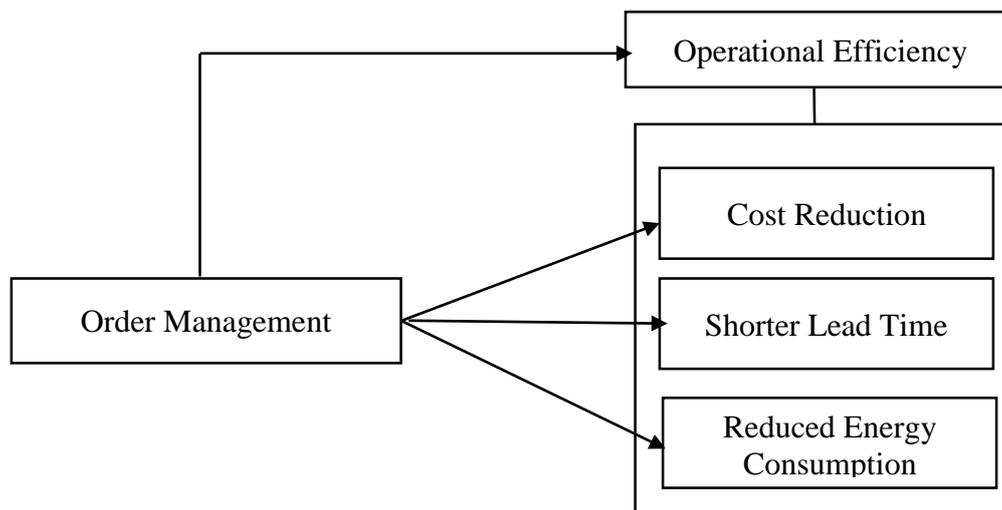


Fig. 1: Conceptual framework of relationship between order management and operational efficiency of food and beverage distributors in Rivers State

Source: Measures of operational performance were adapted from Muralidhar (2018), and Subramanya (2011).

Theoretical Foundation of the Study

This investigation the correlation between order management and operational efficiency of food and beverage distributors in Rivers State is founded on Lean Management Theory which focuses on systematic elimination of waste and inefficiencies to improve productivity and create more value for customers with fewer resources (Ohno, 1988). Lean theory emphasizes inventory reduction, improved flow and enhanced product quality through continuous improvement (Ohno, 1988). The main thrust of the theory is to streamline production processes by identifying non-value-adding activities (waste) and focusing on activities that deliver value to customers (Womack & Jones, 2003).

Lean theory was adopted as baseline theory in this study based on its emphasis on systematic elimination of waste and continuous improvement to enhance operational efficiency (Womack & Jones, 2003). In order management, lean principles involve streamlining workflows, reducing unnecessary steps, and minimizing errors, which collectively lead to more efficient operations (Ionel, 2024). In the food and beverage distribution sector, waste can manifest in multiple forms, such as delays in order fulfillment, inaccurate inventory levels, overproduction, and inefficient use of resources, including energy (Richards & Hamilton, 2022).

Concept of Order Management

According to Stevenson (2021), order management is the systematic coordination of activities involved in receiving, processing, and fulfilling customer orders to ensure efficiency and accuracy. Johnson and Templar (2019) describe it as the process that connects demand

forecasting, inventory control, and logistics to enhance operational efficiency and customer satisfaction. Order management is a critical function in supply chain and operations management that ensure seamless customer order processing and fulfillment (Cui et al., 2020). It involve multiple stages, including order placement, processing, tracking and delivery, all aimed at optimizing efficiency and customer satisfaction (Chopra & Meindl, 2022).

Effective order management streamline processes, reduce errors, improve lead times and minimize operational costs. In industries such as food and beverages, where timely order fulfillment is essential to maintaining product quality and meeting consumer demand, efficient order management is crucial to overall business performance (Christopher, 2020; Suozhu et al., 2017). Cui et al. (2020) argue that order management optimize resources, reduce waste and improve decision-making through data-driven strategies; while Biya (2017) perceive order management as a key determinant of efficient tracking and retrieval of order information through user terminals (Cui et al., 2020).

In addition, order management directly influences business efficiency, customer satisfaction, and overall profitability (Cui et al., 2020) by minimizing errors, eliminating redundancies and optimizing resource utilization (Stevenson, 2021); and enhances customer experience by ensuring timely order fulfillment, reducing stockouts and improving order accuracy (Chopra & Meindl, 2022). For food and beverage companies, efficient order management helps maintain product quality, prevents supply chain disruptions and ensures compliance with regulatory standards (Christopher, 2020).

Concept of Operational Efficiency

Operational efficiency involves proficient use of resources to attain targeted objectives while minimizing waste, costs and redundancies (Abiyesuku & Nwulu, 2025). It is constitutes a paramount element of organizational performance. In the view of Chopra and Meindl (2022), operational efficiency pertains to an organization's capacity to enhance processes, systems, and resources to realize optimal output. In essence, operational efficiency evaluates how well a business is doing in terms of reducing lead times, minimizing waste and ensuring cost-effectiveness (Green et al., 2023; Dinku, 2018).

Obiki-Osafiel et al. (2024), Adebayo and Olawale (2021), Stevenson (2021) and Johnson and Templar (2019) view operational efficiency is firms' ability minimize waste, reduce costs, and improve workflow productivity while not compromising quality and customer satisfaction. Operational directly affects a company's profitability, sustainability and competitive advantage (Sachdeva, 2024). For food and beverages firms, achieving operational efficiency is critical to minimizing energy consumption, maintaining supply chain sustainability, and complying with regulatory standards (Christopher, 2020). Improved efficiency also enhance long-term viability and resilience in highly competitive markets (Johnson & Templar, 2019).

Operational efficiency is inherently pluridimensional (Ateke et al., 2025) and may be broken down into reduction of: distribution costs, order-cycle time, and wastes, as well as optimal resource utilization and energy conservation (Sodhi et al., 2009, as cited in Ateke et al., 2025). In this study however, operational efficiency is measured using cost reduction, shorter lead time, and reduced energy consumption. These are three critical factors determinants of sustainability and competitiveness of firms (Mentzer et al., 2019; Muralidhar, 2018; Subramanya, 2011).

Cost reduction

Cost reduction involves identifying and eliminating unnecessary expenses to improve efficiency and increase profits (Robert, 2016). Effective cost reduction strategies enable companies to optimize resource utilization, streamline operations, and deliver value to customers without compromising quality (Wongjarupun & Apibunyopas, 2022). The purpose of reducing cost is to eliminate unnecessary expenditures that arise from manufacturing, storage, sale and distribution (Macêdo et al., 2023).

According to Leovincy and Nwulu (2025) cost reduction challenge firms to use better methods to lower unit cost of manufactured goods or service delivered, without compromising quality. Cost reduction guarantees savings in cost per unit and the organization's attempt to maximize revenues. Asaolu and Nassar, (2007) defined cost reduction as the process of systematically identifying and eliminating waste or non-value-added activities within an organization to lower costs and improve efficiency. Wordu et al. (2025) views cost reduction as a deliberate, constructive strategy to reduce expenses.

Shorter Lead Time

Lead time is a crucial concept in service operations that refers to the time taken to complete a process from initiation to final delivery (Chin et al., 2024). By minimizing delays, businesses can improve efficiency and responsiveness (Kimwaki, 2024). Shorter lead times help companies meet customer demands more quickly; and contribute to better inventory management and reduced holding costs. Efficient workflows and streamlined operations are key to achieving reduced lead times (Liu et al., 2020).

In supply chain management, shorter lead time refers to the time required for goods to move from production to end users (Oloo et al., 2023). Shorter lead time is essential to improving efficiency, reducing costs, and enhancing customer satisfaction in business operations (Dey et al., 2021; Liu et al., 2020). By minimizing delays in production, procurement, and delivery, companies can respond quickly to market demands (Mohammed & Mandal, 2024).

Reduced Energy Consumption

Reduced energy consumption refers to the deliberate effort to minimize energy usage while maintaining or improving efficiency in operations (Anoune et al., 2024). In industries such as manufacturing, logistics, and food production, reduced energy consumption is crucial to cost savings, sustainability, and environmental protection. Companies achieve this through energy-efficient technologies, optimized production processes and use of renewable energy sources (Cosgrove et al., 2018). Lower energy use not only reduces operational expenses but also decreases greenhouse gas emissions (Jayaraman et al., 2019) dependency on fossil fuels and enhances long-term profitability (Kulova et al., 2024).

Reducing energy consumption while maintaining or improving productivity and efficiency is focus of sustainable business operations today (Dumitrescu et al., 2018). According to International Energy Agency (IEA, 2021), reduced energy consumption involves adopting energy-efficient technologies, optimizing processes, and minimizing energy waste in industrial, commercial, and residential settings. It is often achieved through the implementation of energy management systems, improved insulation, and the use of low-energy appliances (Wang, 2014). The concept is closely related to energy conservation and efficiency, which focus on reducing energy demand and utilizing energy resources more effectively (Jayaraman et al., 2019).

Order Management and Operational Efficiency

Siagian et al. (2022) studied the effect of amended order on firm resilience through supply chain coordination. The study collected data using questionnaire and analyzed same using partial least square technique. The study found that amended orders positively impacts internal operational coordination, coordination with supplier, and positive 0 coordination with customers.

Lehtimäki (2021) examined order management and production control in MTO production. This action research used data interviews and observations. The data analysis revealed challenges related to order and production processes. Major challenges are related to how processes and people are organized. Lack of consistent methods and inefficient and unclear processes. Results show that to reduce these challenges the company should clarify flow of order process and centralize all production orders.

Sarite et al. (2018) evaluated the role of order fulfillment on performance of manufacturing firms in Kenya. A descriptive research design was used. The study adopted both quantitative and qualitative approaches, implying that both descriptive statistics and inferential statistics were employed. The study tested the significance level of each independent variable against the dependent variable at 95% confidence level using ANOVA, correlation and regression techniques. The findings showed that order fulfillment has a positive and significant effect on firm performance.

Oteki *et al.* (2018) examined the influence of e-procurement practices on supply chain performance of sugar processing firms in Kenya. Mixed research design was applied. Data was gathered using self-administered questionnaire, interviews and observation. The results revealed a significant relationship between e-order processing practice and supply chain performance.

Based on the foregoing findings of previous studies, we hypothesize as follows:

H₀₁: There is no significant relationship between order management and cost reduction of food and beverages firms Rivers State.

H₀₂: There is no significant relationship between order management and shorter led time of food and beverages firms Rivers State.

H₀₃: There is no significant relationship between order management and reduced energy consumption of food and beverages firms in Rivers State.

Methodology

This study adopted a cross-sectional survey research design with a correlational method of investigation to examine the relationship between order management and operational efficiency. The population of the study consisted 30 food and beverage distributors in Rivers State as listed in Nigeria Directory (2024). A census technique was employed. However, 3 respondents were drawn from each of 30 firms to serve as respondents. Thus, a total of 90 respondents took part in the study. Categories of respondents included supply chain manager, operations manager and sales/distribution manager. The study utilized structured self-administered questionnaire to collect data. To ensure validity, the questionnaire was reviewed by academic and industry experts. The reliability of the instrument was assessed through a pilot test, followed by the computation of Cronbach's Alpha coefficients for each variable using SPSS version 25.0. A Cronbach's Alpha value of 0.70 or higher was considered acceptable, as suggested by Nunnally (1978) (see Table 1 for reliability results). Pearson Product Moment Correlation was used to test the hypotheses formulated in for study.

Table 1: Reliability Test - Cronbach's Alpha Analysis

S/N	Variables	Number of Items	Cronbach's Alpha Coefficients
1	Order Management	4	0.861
4	Cost Reduction	4	0.806
5	Shorter Lead Time	4	0.859
6	Reduction in Energy Cost	4	0.815

Source: SPSS Output form field data.

Data Analysis and Results

Table 2: Descriptive Statistics on Order Management

	N	Sum	Mean	Std. Deviation	Variance
Your organization processes customer orders quickly and accurately	79	257	3.25	.789	.622
Your order records are captured using an automated system	79	316	4.00	1.111	1.233
Your order management system helps minimize order fulfillment errors	79	334	4.23	1.086	1.180
Your organization integrates customer-specific delivery needs into order processing	79	322	4.07	1.109	1.229
Valid N (listwise)	79				

Source: SPSS Output form field data.

Table 2 shows that all the items under order management recorded scores above 3.00, indicating that a greater number of respondents expressed strong agreement with the statements relating to their organization's order management practices. Among the items, the statement "Your order management system helps minimize order fulfillment errors" recorded the highest mean score of 4.23 with a standard deviation of 1.086, and a total sum of 334. This suggests that most respondents perceived their order management systems as highly effective in reducing errors during the order fulfillment process.

Table 3: Descriptive Statistics of Cost reduction

	N	Sum	Mean	Std. Deviation	Variance
Your warehousing operations help reduce handling and storage costs	79	354	4.48	1.089	1.187
Your automation practices lower labor-related expenses	79	325	4.11	1.034	1.070
Your inventory tracking system minimizes losses and product wastage	79	329	4.16	.898	.806
Your warehouse practices reduce the cost of returns and replacements	79	320	4.05	.669	.448
Valid N (listwise)	79				

Source: SPSS Output form field data.

Table 3 shows that all the items on cost reduction recorded mean scores above 3.00, indicating that a greater number of the respondents expressed strong agreement with the statements relating to cost-saving practices in warehouse operations. Among the items, the statement "Your warehousing operations help reduce handling and storage costs" recorded the highest mean score of 4.48 with a standard deviation of 1.089 and a total sum of 354. This suggests that respondents strongly agreed that effective warehousing operations play a key role in minimizing handling and storage expenses.

Table 4: Descriptive Statistics of Shorter Lead Time

	N	Sum	Mean	Std. Deviation	Variance
Your warehouse operations support fast and timely order fulfillment	79	334	4.23	.883	.780
Your customer orders are processed and shipped within a standard timeframe	79	347	4.39	.900	.809
Your order management system helps avoid delivery delays	79	338	4.28	.452	.204
Your warehouse practices ensure timely stock replenishment	79	341	4.31	.886	.785
Valid N (listwise)	79				

Source: SPSS Output form field data.

Table 4 shows mean scores exceeding 3.00 for items on lead time. This means that more of the respondents expressed very high and high extents of acceptance to the research question with respect to shorter lead time. However, it can be seen that question 2 which sought to determine the extent to which managers of food and beverages firms in Rivers State need to keep doing the right thing to keep up with results or improve on them, has the highest mean score of 4.48. This shows that question 2 has the strongest influence on the variables.

Table 5: Descriptive Statistics of Reduced Energy Consumption

	N	Sum	Mean	Std. Deviation	Variance
Your warehouse uses energy-efficient lighting or refrigeration systems	79	344	4.36	.984	.968
Your space utilization strategies contribute to lower energy consumption	79	332	4.20	1.093	1.194
Your energy usage is monitored and controlled in warehouse operations	79	338	4.28	1.035	1.071
Your warehouse automation lowers overall electricity use	79	330	4.18	.885	.784
Valid N (listwise)	79				

Source: SPSS Output form field data.

Table 5 shows that all items on reduced energy consumption recorded mean scores above 4.00, indicating that a greater number of the respondents expressed strong agreement with the statements relating to energy efficiency in warehouse operations. Among the items, the statement “Your warehouse uses energy-efficient lighting or refrigeration systems” recorded the highest mean score of 4.36 with a standard deviation of 0.984 and a total sum of 344. This suggests that respondents strongly believe energy-efficient systems contribute significantly to reducing energy consumption in their warehousing activities.

Table 6: Relationship between Order management and Cost reduction

		Order management	Cost reduction
Order management	Pearson Correlation	1	.787**
	Sig. (2-tailed)		.000
	N	79	79
Cost reduction	Pearson Correlation	.787**	1
	Sig. (2-tailed)	.000	
	N	79	79

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

Source: SPSS Output form field data.

From the SPSS output on Table 6, it can be observed that there is a correlation coefficient of 0.787** between order management and cost reduction, indicating a strong significant relationship between the variables. More so, the probability value (0.000) is less than the critical value (0.05). This means that there is a significant relationship between order management and cost reduction. Based on this, we reject the null hypothesis that there is no significant relationship between order management and cost reduction of food and beverages firms in Rivers State.

Table 7: Relationship between Order management and shorter lead time

		Order management	Shorter lead time
Order management	Pearson Correlation	1	.490**
	Sig. (2-tailed)		.000
	N	79	79
Shorter lead time	Pearson Correlation	.490**	1
	Sig. (2-tailed)	.000	
	N	79	79

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

Source: SPSS Output form field data.

From the SPSS output on Table 7, it can be observed that there is a correlation coefficient of 0.490** between order management and shorter lead time, indicating a moderate significant relationship between the variables. More so, the probability value (0.000) is less than the critical value (0.05), this shows that there is a moderate significant relationship between order management and shorter lead time. Based on this, we reject the null hypothesis that there is no significant relationship between order management and shorter lead time of food and beverages firms in Rivers State.

Table 8: Relationship between Order management and reduced energy consumption

		Order management	Reduced energy consumption
Order management	Pearson Correlation	1	.887**
	Sig. (2-tailed)		.000
	N	79	79
Reduced energy consumption	Pearson Correlation	.887**	1
	Sig. (2-tailed)	.000	
	N	79	79

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

Source: SPSS Output form field data.

From the SPSS output on Table 8, it can be observed that there is a correlation coefficient of 0.887** between order management and reduced energy consumption, indicating a very strong significant relationship between order management and reduced energy consumption. More so, the probability value (0.000) is less than the critical value (0.05), this shows that there is a very strong significant relationship between order management and reduced energy consumption. Based on this, we reject the null hypothesis that there is no significant relationship between order management and reduced energy consumption of food and beverages firms in Rivers State and accept the alternate hypothesis that there is a very strong, significant relationship between order management and reduced energy consumption of food and beverages firms in Rivers State.

Discussion of Findings

The data analysis conducted in the study revealed that order management has statistically significant correlation with operational efficiency of food and beverage distributors in Rivers State. This based on the evidence that order management has a strong relationship between cost reduction; a moderate significant relationship with shorter lead time and a very strong relationship with reduced energy consumption. In addition, all the correlation were statistically significant. The findings of the study corroborate that of Siagian et al. (2022), which found that amended order systems significantly enhance internal and external operational alignment.

Additionally, the findings agree with Lehtimäki (2021), which found that inefficient and fragmented order processes hinder operational clarity, while a centralized and streamlined order system improves production flow and performance efficiency. The findings further align with that of Sarite et al. (2018) that order fulfillment has a strong positive and significant effect on firm performance, underscoring the contribution of timely order execution to organizational efficiency. Furthermore, the results are consistent with Oteki et al. (2018), who found that electronic order processing had a significant positive effect on supply chain performance.

Conclusion and Recommendations

In line with the findings of the study and their consistency with results of previous studies, the study concludes that order management has significant relationship with operational efficiency of food and beverage firms in Rivers State. This means that effective order management is essential to improved operational efficiency of food and beverage firms in Rivers State. Specifically, effective implementation of order management meaningfully contributes to cost reduction, shorter lead time and reduced energy consumption, which are key indicators of operational performance. Thus, the study recommends that managers of food and beverage firms should adopt order management as it enhances their operational efficiency.

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