Lean Inventory System and Supply Chain Performance of Food and Beverage Firms in Rivers State

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Abstract

This study investigated the relationship between Lean Inventory System and supply chain performance of food and beverage firms in Rivers States. Specifically, the objectives of the study were to ascertain the extent to which lean inventory system relates with supply chain performance of food and beverage firms in Rivers States. The population of this study was 25 food and beverage firms in Rivers State. Five (5) administrative managers of the food and beverage firms - logistics manager, production manager, customer service manager, account manager, and procurement/ purchasing manager will be respondents from each of 25 of food and beverage firms totaling 125 respondents food and beverage firms in Rivers State that will provide primary data that will be used to ascertain the relationship between the variables. The primary data were collected through a structured questionnaire that was designed in five point Likert scale ranging from very high extent to very low extent. Two (2) research hypotheses were tested using Pearson Product Moment Correlation was the test statistics. The stud y revealed there is a positive and significantly relationship between lean inventory system and supply chain performance of food and beverage firms in Rivers State. The study concludes that lean inventory system relates supply chain performance food and beverage firms in Rivers State. The study recommends that managers of food and beverages firms should adapt techniques that will enhance their supply chain performance. All statistical tools were done using SPSS 22.0.

Introduction

In order to thrive in the current business landscape, companies must continuously generate novel goods, services, and procedures. In every company or organization, all functions are interconnected and interdependent, frequently overlapping, especially in the food and beverage sector. The food and beverage sector is a diverse and well-known organization. Gomes (2017) observed that the food and beverage sector may be defined as the management of many activities

including procurement, reception, storage, distribution, manufacturing, and provision of services for both full and light meals. According to Dias, Daly, and Patuleia (2021), the food and beverage company does not merely sell meals, but rather they sell a combination of the product or service, gastronomy, ambience, comfort, safety, and consumer expectations. The company sells both tangible and intangible characteristics that are valued by the consumer. The food supply chain starts with the manufacturer of products or services, aiming to ultimately reach the customer. In order to do this, additional stages must be overcome, such as packing the goods and then distributing it to retailers, ultimately reaching the customer. The food and drinks company implements a lean inventory system to efficiently carry out operations and ensure timely delivery.

The firm's operational efficiency and delivery speed are determined by the use of the lean inventory system. These capabilities assist the supply chain manager in making crucial choices about inventory management. Supply chain management, logistics, and inventory are essential components that form the foundation of the business delivery function (Samanta, 2017). Furthermore, according to Coyle, Bardi, and Langley (2003), inventory has gained greater importance as an asset on companies' balance sheets due to the trend of many firms to decrease their investment in fixed assets such as plants, warehouses, office buildings, equipment, and machinery. Efficient operation of a business's operations relies on the maintenance of an optimal inventory level (Odisha, 2019). Every firm consistently endeavors to maintain an optimal inventory level in order to fulfill its needs and prevent excessive or insufficient inventory that may have an influence on financial performance (Samanta, 2017). The profitability and long-term viability of a company depend on the establishment of an organizational culture that promotes and embraces significant financial changes, as well as the commitment of senior management to maintaining lean inventories (Myerson, 2012; Liker, 2008).

In the Just-In-Time system, lean inventory refers to the practice of maintaining little or no inventory. This ideal condition involves selling a product and immediately ordering a replacement. Lean inventory management is a concept and philosophy used by a growing number of firms, serving as an enterprise organization and management approach (Pauluk & Oláh, 2015). The term 'lean supply chain' is being used more often. Lean inventory management is now not just used by large corporations, but it has also become a new prerequisite for suppliers to adhere to these fundamental principles in their operations. The crucial takeaway is that Lean imparts to us robust business concepts. Lean is not a passing trend, temporary fad, or short-lived flavor of the month. The ideas and instruments for business excellence are bundled in a well-organized manner (Nasim, Maaz, Ali, & Khan, 2016). The lean inventory management method is the primary approach in inventory management that has a substantial impact on performance (Hahn & Packowski, 2015). An optimal objective for a corporation should be to minimize its inventory to the greatest extent feasible (Krar, 2018).

Industry observers are involved in managing several forms of inventory. Cycle stock refers to inventory that arises from the process of replenishment and is necessary to fulfill demand under particular situations. In-transit inventories refer to products that are now being transported from one place to another. Excess inventory, known as safety or buffer stock, is maintained in addition to cycle stock due to uncertainties in demand or lead time. Speculation stock refers to inventory

stored for purposes other than meeting immediate demand. Seasonal stock refers to a type of speculative stock that involves gathering inventory before a particular season starts. This is done to ensure a consistent workforce and production runs. In the case of agricultural products, seasonal stock refers to inventory accumulated during the growing season, which is limited in availability throughout the year. On the other hand, dead stock refers to inventory that is unwanted, at least in the immediate term. The inventory manager's responsibility is to guarantee the appropriate inventory is obtained at the correct time, with the desired quality, from the appropriate location, and at the optimal price. This is done in order to decrease the production costs of goods or services. The management of lean inventory is the greatest challenge for a firm's management. A company that fails to implement the lean inventory system risks compromising its long-term profitability and may eventually face failure.

Saleheen and Habib (2022) stated that precise performance measurement is advantageous for businesses in developing, executing, and overseeing organizational strategy. They also emphasized the significance of employee motivation and the retention of organizational culture in this measurement. A prosperous firm is one that can effectively fulfill customer demand by delivering items at the appropriate location, with the desired level of quality, and within the specified timeframe. Supply chain management plays a crucial role in determining the company's competitive advantage in this scenario. According to Putri, Huda, and Sinulingga (2019), organizations with superior supply chain performance have a higher probability of becoming victorious in the competition. In order to achieve success in the current context, supply networks must undergo continuous enhancement (Hausman, 2002). Therefore, to achieve this goal, it is necessary to have performance measurements, often known as "metrics", that promote enhancements in the overall performance of the global supply chain, rather than focusing on metrics that are particular to individual companies or functions, which hinder advances throughout the whole chain.

In today's business landscape, the CEO must not just concentrate on the success of their own firm, but also on the performance of the whole supply chain or network in which their company is involved (Hausman, 2002). In order to foster and promote the enhancement of the supply chain, it is essential to go beyond conventional functional and company performance indicators. Instead, we must devise novel metrics that possess sufficient intricacy and depth to effectively evaluate supply chain performance, rather than just focusing on individual business performance. Every operator in an industry aims to attain supply chain performance evaluated using financial, customer, internal, and learning-based criteria. However, companies often spend significant resources but fail to achieve their anticipated outcomes. Several research endeavors have been undertaken to examine the impact of various components of a lean inventory system on supply chain performance (Ogonu, Ikeguwru, & Nkokah; Achuora & Arasa, 2020; Govindan, Azevedo, Carvalho, and Cruz-Machado 2015; Plunkett & Haider 2013). Ensure clarity and understanding across the organization by creating a model that is accessible to everyone at all levels. An optimal objective for a company should be to minimize its inventory to the greatest extent feasible.

Literature is replete with studies that seek to establish a connection between various elements of lean inventory systems and the performance of supply chains. Elking, Paraskevas, Grimm, Corsi,

and Steven (2017) conducted a study to examine the correlation between financial dependency, lean inventory management, and company performance. The study conducted by Talib Bon and Garai (2009) examined The use of a just-in-time method in the management of inventories. Pauluk and Oláh (2015) conducted a study to analyze the function and significance of lean technologies in warehouse management. Kennedy, Plunkett, and Haider (2013) applied lean concepts to a food manufacturing firm. Govindan, Azevedo, Carvalho, and Cruz-Machado (2015) conducted a research to examine the impact of Lean, green, and resilient practices on supply chain performance. Meanwhile, Achuora and Arasa (2020) aimed to establish a connection between lean inventory management systems and performance. Nevertheless, none of these studies made an effort to establish a connection between a lean inventory system and the performance of the supply chain. The primary objective of this research is to establish the correlation between a lean inventory system and the supply chain performance of food and drinks companies in Rivers State. The metrics used to measure supply chain performance in this study are operational effectiveness and delivery time.The investigation is guided by the following developed hypotheses.

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Ho_1: lean inventory system does not significantly relate with operational effectiveness of food and beverage firms in Rivers State.

Ho_2: lean inventory system does not significantly relate with delivery time of food and beverage firms in Rivers State.

Study Variable/Conceptual Framework

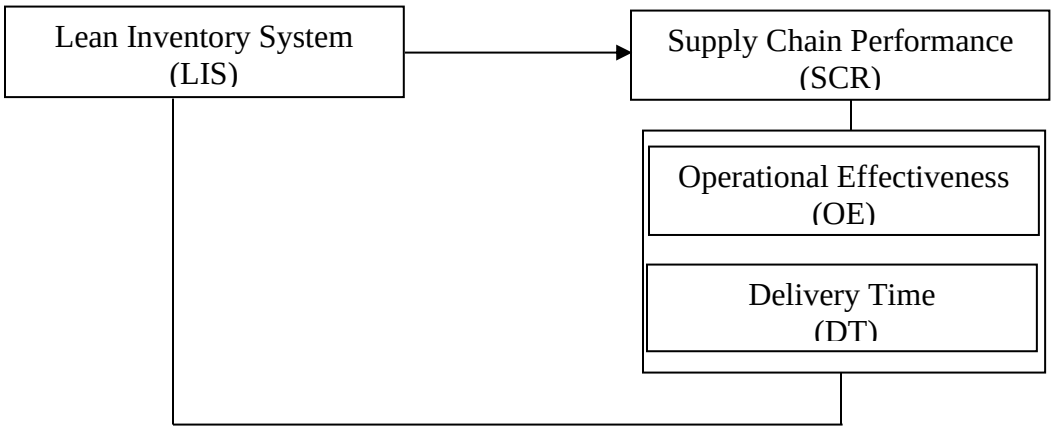

Figure 1.1: Conceptual framework of the relationship between inventory management and supply chain performance of food and beverage firms in Rivers State.

Source: Ogonu, Ikegwuru & Nwokah (2016), and Hanson. & Didia (2022), Chin, Tummala, Leung, & Tang (2004)

2. Literature Review/ theoretical Foundation of the Study

2.1 Strategic Choice Theory (SCT)

The strategic choice theory pertains to the decisions taken by senior executives with the aim of enhancing performance. Child (1972) proposed a theory that focuses on the managerial choices and decisions that aim to enhance organizational performance. Campling and Michelson (1998) proposed a strategic decision model that illustrates the interconnectedness between the environment and various components such as entities, activities, and overall company performance. According to Child (1972), it is crucial for top management to possess both authority and accountability in order to effectively oversee the flow of products and services inside their organization. These movements include many activities like as inventory management, supplier engagement, communication, and innovation, among other things. Ketchen and Hult (2007) examine the use of SCT as a method for managers to implement changes, such as Just-in-Time and lean management, in order to enhance inventory management. This makes SCT a suitable theory for the research.

2.2 Concept of Lean Inventory System

The counterintuitive nature of lean concepts might provide a challenge for operations professionals in fully embracing their value proposition. Therefore, a transportation manager would grapple with the idea of raising the frequency of deliveries if their individual performance is evaluated based on transportation expenses. Therefore, for the effective implementation of lean logistics, it is imperative that it be approached as a collaborative effort. It is important to note that a firm does not necessarily have to be a streamlined organization before using Lean in the logistics sector (Nasim, Maaz, Ali, & Khan, 2016). The use of lean inventory management systems (LIMS) is believed to improve the performance of organizations by reducing the expenses related to inventory management in firms where inventory represents a substantial component of operational expenditures (Achuora & Arasa, 2020). Lean is a corporate concept that emphasizes the pursuit of simplicity and cost-effectiveness, while delivering exceptional quality and efficient service. Excessive production or excessive stocking results in a higher inventory and idle funds (Krar, 2018). Inventory refers to any merchandise that is stored, whether inside or outside the factory, for whatever duration of time. In the Lean system, inventory is seen as a symptom of an inefficient production.

Lean inventory management is a methodical strategy to increasing the value of a company's inventory by detecting and reducing wasteful use of resources, work, and time. This is achieved by ongoing improvement efforts aimed at achieving perfection and optimal performance (Shardeo, 2017). Furthermore, just-in-time, backordering, crossdocking, and drop shipping are among the often used lean inventory management systems. Sheikh (2016), Hahn and Packowski (2015), and Shardeo (2017). Lean management is a strategic approach to organization and management that is being adopted by a growing number of firms. It is not just a notion that is often seen as mysterious, but also a philosophy that guides the way businesses operate (Pauluk & Oláh, 2015). The term 'lean supply chain' is increasingly being employed. Lean management is now not just used by businesses, but it has also become a new prerequisite for suppliers to incorporate these fundamental ideas into their operations. The crucial takeaway is that Lean imparts to us robust business concepts. Lean is not a passing trend, temporary fad, or short-lived flavor of the month. The ideas and instruments for business excellence are carefully bundled (Nasim, Maaz, Ali, &

Khan, 2016). The lean inventory management method is the primary approach in inventory management that has a substantial impact on performance (Hahn & Packowski, 2015).

A Lean inventory management system enables a distributor to fulfill or surpass consumers' expectations about product availability while optimizing the distributor's net profitability (Krar, 2018). Shardeo (2017) posits that a company may use many LIMS, but emphasizes the need of implementing optimum practices. The key to success is identifying the LIMS that align with the business's requirements and having the necessary tools to implement them effectively and efficiently. Within a Lean system, inventory is considered an indication of a malfunctioning plant that requires urgent intervention (Krar, 2018). Within the Lean Inventory system, we examined management-oriented systems such as Just-in-time (JIT) and materials requirements planning (MRP) Systems.

Just in Time (JIT) is an inventory technique that organizations use to enhance efficiency and minimize waste by acquiring items just when they are required in the manufacturing process. This approach effectively reduces inventory costs (Odisha, 2019). The Just-in-time system is a pull-type inventory control system (Samanta, 2017). Just-in-time refers to a set of techniques that aim to eliminate waste (Ogonu et al., 2016). This method is widely utilized in new technologies and is considered one of the most popular. Just-in-time systems aim to minimize inefficiency and wasted time in the manufacturing process in order to consistently enhance the process and the quality of the product or service (Mpwanya, 2005). The JIT production is known by several terms, such as zero inventory production system (ZIPS), minimal inventory production system (MIPS), kanban production, kaizen production, stockless production, pull-through production, and rapid reaction (QR) inventory systems (Mpwanya, 2005).

The term first denoted the process of manufacturing food products that precisely align with the customer's requirements in terms of timeliness, quality, and quantity, regardless of whether the client is the end consumer or another stage in the production chain. The just-in-time inventory system aims to improve a business's return on investment by minimizing inventory levels and the expenses associated with storing it (Ogonu et al., 2016). It underlines the importance of manufacturers creating things that are convenient and readily available when needed. Just-in-time systems are referred to by several terms, such as zero inventory, synchronous manufacturing, lean production, stockless production, material as required, and continuous flow manufacturing (Krajewski & Ritzman, 1999). It has been intended for the purpose of minimizing waste during production (Samanta, 2017). Waste, in its broadest definition, encompasses not only materials but also time and resources (Kiyoshi, 1987). The majority of research efforts have concentrated on elucidating the principles of Just-in-Time (JIT) philosophy. Various research included conceptual and experimental investigations, mathematical models, and simulations in several instances.

The key elements of JIT include collaborative product design with suppliers and consumers, adoption of single sourcing from nearby suppliers, minimization of machine set-up times, and comprehensive preventive maintenance (Ogonu et al., 2016). The significance of just-in-time and inventory reduction is in the prompt notification of the depletion of existing stocks, which triggers

the procurement of new stocks (Ogonu et al., 2016). Organizations prioritize quality improvement and cost management to boost job performance and meet client requirements. Accumulating inventories in excessive amounts leads to wastage and occupies unnecessary space. An efficient approach is to use the Just in Time (JIT) principle, which helps save expenses, enhance quality, and effectively address the dynamic demands of customers. Implementing Just in Time (JIT) ideas seems to be the most efficient method for overcoming these situations. JIT, or Just-in-Time, is a management concept that focuses on the elimination of waste and the improvement of production (Talib Bon and Garai, 2009).

The Materials Requirements Planning (MRP) system is an automated technology designed to minimize inventories and ensure timely supply (Ogonu et al., 2016). MRP, or Material Requirements Planning, is a systematic process used to transform projected demand for a produced item into a detailed plan for acquiring the necessary components, subassemblies, and raw materials (Samanta, 2017). Krajewski and Ritzman (1999) observe that Material Requirements Planning (MRP) converts the master production schedule and other demand sources into the necessary quantities of subassemblies, components, and raw materials required to manufacture the final products. This method depends on the production schedules created for the final part numbers in the master production schedule (MPS) in order to ascertain the specific time and quantities of materials needed for components or subassemblies (Monczka, Trent & Handfield, 2002). The process of Material Requirements Planning (MRP) begins with ascertaining the precise quantity of the end product that clients need, as well as their specific timeframe for its delivery (Mpwanya, 2005).

From a logistical perspective, the primary objective of Material Requirements Planning (MRP) is to minimize the need for storing these products in inventory. According to Lysons and Guillingham (2003), MRP communicates the necessary requirements for materials and components needed to produce a final product within a certain time frame. This is based on projections provided by marketing, sales, and other input information. According to Coyle et al. (as stated in Gourdin, 2001), MRP focuses on providing resources and component components that are needed for a certain end product, and their demand is directly related to the need for that specific product (Mpwanya, 2005). The MRP technique prioritizes a practical master production plan (MPS) to efficiently coordinate production phases in terms of production volume, while avoiding the occurrence of excessive slack between stages (Samanta, 2017). Furthermore, the MRP system is based on the recognition that the demand for one item may depend on the demand for other inventory products (Ogonu et al., 2016). MRP also emphasizes the calculation of demand that is influenced by other factors. It avoids the occurrence of unnecessary gaps between stages caused by imbalanced lot sizes of a matched set of components (Samanta, 2017).

2.3 The Concept of Supply Chain Performance

Supply chain is an intricate and ever-changing network of collaborators, including a system of companies, people, operations, information, and resources that are engaged in the transportation of a product or service from the supplier to the client. To clarify, supply chain operations include the conversion of natural resources, raw materials, and components into a finalized product that is

then transported to a final consumer (García-Alcaraz, Sánchez-Ramírez, Avelar-Sosa, & Alor-Hernández, 2020). Supply chains are globally interconnected, including manufacturing systems. It is typical for natural resources to be harvested in one nation, components to be made in another, and the finished product to be assembled in yet another country. Performance assessment is vital for effective organizational management. It is necessary to utilize accurate measurement criteria to avoid compromising the research and wasting significant resources invested in conducting it. Wankhade and Kundu (2018) have provided extensive evaluations of performance measuring approaches in supply chain management. Supply chain performance refers to the methodical evaluation of the efficacy and efficiency of supply chain operations (Sundram, Chandran & Bhatti, 2015).

The process of assessing the efficiency and efficacy of activities conducted may be seen as supply chain performance assessment (Shepherd & Gunter, 2012). The efficacy and proficiency of a supply chain's performance serves as a measure of the system's functionality. Effectiveness refers to the amount of customer expectations being met, whereas efficiency measures the use of corporate assets in delivering a certain level of customer satisfaction (Neely, Gregory, & Platts, 1995). The degree of customer satisfaction is determined by the extent to which their expectations are met in relation to the performance of the organization. Louw and Goedhals-Gerber (2014) argue that the purpose of supply chain performance is to gather data and understanding about the effectiveness of the supply chain by monitoring important factors such as product quality and inventory levels. Tracking the indicators is essential for accurately measuring the success of the organization's supply chain. The supply chain's performance monitoring system necessitates the careful selection of indicators (Shaw & Grant, 2010). The appropriate choice of the indicator depends on the management of the organization and the logistic manager who has a comprehensive awareness of the internal and external dynamics of the industry.

In order to assess supply chain performance (SCP), managers need to be aware of the specific nature of their supply chain. Furthermore, they must possess knowledge of the methodologies that may be used to assess this performance. According to Ambe (2014), assessing SCP may provide a more comprehensive knowledge of the SC, favorably impact the actions of those involved, and enhance its overall performance. The ideal performance measurement model should include both quantitative and qualitative approaches and has the capability to use various measuring instruments (Saleheen & Habib, 2022). Moreover, the performance measuring metrics should align with certain characteristics such as comprehensiveness, universal acceptance, and stability (Hussain et al., 2019).

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2.4 Measures of Supply Chain Performance

In their research, Chin, Tummala, Leung, and Tang (2004) analyzed supply chain management methods and evaluated their impact on supply chain performance, which was assessed based on delivery time, system dependability, and cost reduction. In a similar vein, Panayides and Lun (2009) examined the influence of trust on both innovativeness and supply chain performance. The study assessed supply chain performance by considering various factors such as on-time delivery, reduced lead time, responsiveness, cost reduction, conformance to specifications, process

improvements, and time-to-market. Wibowo and Sholeh (2015) found that flawless order fulfillment, lead time, product adaptability, inventory days of supply, and supply chain management cost are all indicators of supply chain effectiveness. In their study, Adiomamore and Nadube (2022) examined the impact of strategic supplier partnerships on the supply chain performance of a food and beverage company. They measured this impact by assessing service quality and customer happiness. Hanson and Didia (2022) conducted a research on the relationship between brand personality and supply chain performance in paint manufacturing enterprises. The study assessed supply chain performance based on measures of operational effectiveness and operational efficiency. This research used the concept of operational effectiveness as defined by Hanson and Didia (2022), and the notion of delivery time as defined by Chin, Tummala, Leung, and Tang (2004).

Operational Effectiveness

Organizations are increasingly motivated to enhance operational efficiency and establish successful operational procedures (Hill, 2000; Chambers & Johnston, 2004). Operational effectiveness encompasses efficiency and other related factors. It encompasses several strategies that enable a corporation to optimize its resources, such as minimizing product faults or enhancing product development speed (Porter, 1996). Operational effectiveness entails the need to provide items or services that enhance value, possess exceptional quality, are delivered punctually, and are priced competitively. Therefore, firms striving to achieve these goals must prioritize their operational efficiency, since it is a key factor in determining corporate success (Chambers & Johnston, 2004 quoted in Knott & Medina, 2012). Efficiency in operations is crucial for achieving outstanding performance, which ultimately is the main objective of every organization. Operational effectiveness (OE) refers to the ability to carry out identical operations in a superior manner compared to competitors (Porter, 1996).

According to Charkha and Jaju (2015), the efficiency of a supply chain management (SCM) may be assessed by examining the performance at three decision-making stages for various cycle processes, including procurement, manufacturing, and distribution. Performance indicators facilitate the achievement of supply chain management objectives by providing valuable data that aids in ongoing improvement. Over the last twenty years, there has been a surge in the creation of industrial programs with the objective of diminishing inventory levels and enhancing efficiency in the manufacturing process (Samanta, 2017).. Additionally, he observed that conwip, kanban, just-in-time production, lean manufacturing, and flexible manufacturing are among the most often used methods. However, despite the negative aspects linked with inventories, they do serve beneficial functions. Raw material stocks provide as a consistent supply of necessary inputs for manufacturing (Samanta, 2017). The production of an industry is contingent upon the raw materials available to it. If these raw materials possess unfavorable characteristics, it will inevitably impact the manufacturing process and the final output.

Operational effectiveness pertains to a company's proficiency in attaining operational objectives, hence enhancing its capacity to effectively compete in the market (Hanson & Didia, 2022). The present proliferation of media and channels is a significant factor driving the changes in the marketplace. This presents novel prospects for both organizations and consumers. Certain

organizations are opting to exclude conventional media and channels from their strategy for offering exceptional service, while others are using them to enhance their current portfolio. Operational efficiency pertains to the capacity of establishing efficient procedures, using basic skills inside businesses, that function effectively (Porter, 1996). Operational effectiveness refers to enhancing the performance of processes by effectively managing and overseeing them inside the organization, while also monitoring and enhancing their efficiency (Knott & Medina, 2012). By implementing these fundamental procedures, the firm may optimize resource use, minimize inefficiencies, adopt more suitable technologies, and ultimately outperform rivals (Porter, 1996).

Delivery Time

Delivery time refers to the duration it takes for bought products to reach their desired destination. The timeliness of delivery has a substantial impact on both customer satisfaction and the overall success of a firm (Al-Shboul, 2017). Additionally, it is very easy to measure the advantages of delivering on time or the consequences of delayed delivery. Delivery time is a primary goal in the management of supply chain and logistics. One of the primary considerations in evaluating supplier performance for firms is (Hanghøj, 2015). For instance, there might be repercussions for failing to meet delivery timeframes, or consumers may choose to cancel purchases that have not been completed. Nevertheless, a less quantifiable consequence is the occurrence of lost sales, which refers to a decrease in the number of orders due to delayed delivery. Delivery performance is widely acknowledged as a crucial aspect in supply chain management, as highlighted in the supply chain performance literature (Guiffrida et al., 2015).

Their objective is to ascertain the optimal amount of delivery variability that minimizes costs resulting from late deliveries. Various ideas and models have been established during the examination of the significance of delivery performance in supply chain management. Guiffrida (2014) provides a comprehensive analysis of supply chain delivery performance models that are centered on the concept of the delivery window. These studies consider both early and late deliveries to be detrimental. Early deliveries result in higher inventory costs, while late deliveries might lead to production issues and missed revenues. In addition, Bushuev and Guiffrida (2012) conducted research on determining the most advantageous placement of the delivery window, with the aim of minimizing anticipated penalty charges resulting from deliveries that are either too early or too late. Bhattacharyya and Guiffrida (2015) made the assumption that the cost of delivering goods late is considered a penalty cost. However, they did not provide any discussion on the method used to compute this price.

Lean Inventory System and Supply Chain Performance

In their study, Achuora and Arasa (2020) investigated the impact of lean inventory management systems on the performance of supermarkets in Nairobi County, Kenya. The study used a descriptive research methodology and conducted a survey on 113 stores that were randomly selected from a total of 158 supermarkets in Nairobi City County. The major data gathering tool used was a structured questionnaire. The questionnaire was sent to the supply chain managers of the supermarkets using a drop-off and pick-up method. The instrument underwent piloting to assess its validity, reliability, and to identify any possible deficiencies. The research used a

multiple regression model to assess the hypothesized model. The statistical package for social science (version 21.0) was used to conduct the tests. The research uncovered a strong and meaningful correlation between the use of efficient inventory management systems and the overall performance of supermarkets.

Abdinasir (2020) examined the impact of inventory management systems on the performance of pharmaceutical companies in Kenya. This study used a descriptive research approach. This research used a sample of 150 individuals specifically selected from the procurement department of 50 Pharmaceutical businesses currently operating in Kenya. The purposive sample approach was used to choose 75 out of the total staff members working in the procurement department of the pharmaceutical businesses. The data analysis was conducted using SPSS version 21. The study used regression and correlation techniques to establish the presence of links between management performance and systems, as well as to identify potential linkages between variables. The research found that pharmaceutical businesses faced a substantial challenge in deploying systems due to a lack of sufficient technology to support the endeavor.

In his study, Kwadwo (2016) investigated the influence of effective inventory management on the financial gains of manufacturing companies in Ghana. The research used a cross-sectional design and incorporated secondary data. The cross-sectional data collected covers the time frame of 2004-2014, sourced from the annual reports of four industrial businesses listed on the Ghana Stock Exchange. The four firms were chosen using the judgemental sampling method. An analysis was conducted to assess the profitability metrics and their correlation with indicators of effective inventory management among firms. Data analysis used the ordinary least squares (OLS) method, namely in the form of multiple regression models. The research uncovered a substantial and robust association between inventory management and profitability of manufacturing enterprises in Ghana.

Talib Bon and Garai (2009) conducted a study on the implementation of the Just-in-Time technique in inventory management specifically in Malaysia. The research aimed to determine if the deployment of Just-in-Time (JIT) would decrease inventories in the electronics component business, particularly in the parts production of FCM stamping. This research is conducted via a case study methodology. Hence, the data collection will rely on secondary data, namely the documentation provided by FCM and observations made throughout the process. The data were evaluated by doing a comparison between the pre- and post-implementation of Just-in-Time (JIT) using Microsoft Excel. Based on the conducted study, the deployment of Just-in-Time (JIT) has improved inventory management in the manufacture of stamping components. In conclusion, the use of Just-in-Time (JIT) in inventory management at the parts production stamping in the Electronics component business has effectively reduced inventory levels while simultaneously enhancing inventory management.

Pauluk and Oláh (2015) investigated the function and significance of lean tools in warehouse management in Hungary. The study's objective is to provide lean technologies that may be used in a warehouse setting. The research elucidated the concept of lean thinking, which encompasses not only the creation of more value for consumers with fewer resources, but also represents a whole

philosophy. The research offered valuable insights into various lean methodologies and technologies that warehouses may use to enhance operational efficiency. The research used the case study technique to investigate the application of 5S in the material supply department of Lego Manufacturing Ltd. in Nyíregyháza.

3. METHODOLOGY

The study used an explanatory research design. This research employs a cross-sectional survey technique to provide explanations. The study utilizes a standardized questionnaire that has been developed by Hanson and Didia (2022). The study examines the inventory management and supply chain performance of food and beverage companies operating in the food and beverage sector specifically in Rivers State. A refined five-point Likert scale, spanning from a high level to no extent, was used in this investigation. The previous instrument will be redesigned into a five-point Likert scale, specifically tailored for use in the courier business. The target population encompasses all individuals belonging to a certain group on which the inquiry is conducted, whereas the accessible population refers to the subset of individuals within the group that the researcher may readily access. The study's population consisted of 25 food and beverage companies listed in the Rivers State Yellow page for the year 2013/2014. A total of 125 responses will be selected from 25 food and beverage enterprises, with each company providing five administrative managers: a logistics manager, a production manager, a customer service manager, an account manager, and a procurement/purchasing manager. A sufficient sample size is required to enable accurate conclusions about the population based on the sample. The research population consisted of 25 food and beverage companies listed in the Rivers State Yellow page for the year 2013/2014. The sample consists of 125 respondents who are administrative managers in the food and beverage industry. Specifically, the respondents include logistics managers, production managers, customer service managers, account managers, and procurement/purchasing managers. Each of the 25 food and beverage firms in Rivers State will contribute one respondent.

4. RESULTS

Table 1: showing the Relationship between Lean Inventory System and Measures of supply change performance

			Lean inventory system	Delivery time
Pearson Product Moment Correlation	Lean inventory system	Correlation Coefficient	1.000	.648**
		Sig. (2-tailed)	.	.000
		N	69	69
	Delivery time	Correlation Coefficient	.648**	1.000

	Sig. (2-tailed)	.000	.
	N	69	69

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

Source: Field work, 2023.

The relationship between lean inventory system and delivery time is revealed to be significant given the observed correlation 0.648** and a p-value of .000 which is less than 0.05 (table 1). The correlation value shows a strong and significant relationship between both variables at a 95% confidence interval; implying that the more an organization apply lean inventory system, the higher the higher the level of timely delivery. This is supported by a correlational value of 0.648 revealing a direct relationship between lean inventory system and delivery time. Based on this outcome, the hypothesis of no significant relationship between lean inventory system and Delivery time of Beverage food companies in Rivers State **(**Null) hypothesis is rejected based on the decision rule of $P < 0.05$. We therefore accept the alternative hypothesis and restate the null that lean inventory management is significantly related to increase in delivery time.

Table 2: showing the Relationship between Dimension of Lean Inventory System and Measures of supply change performance

			Lean Inventory System	Operational Effectiveness
Pearson Product Moment Correlation	Lean Inventory System	Correlation Coefficient	1.000	.664**
		Sig. (2-tailed)	.	.000
		N	69	69
	Operational Effectiveness	Correlation Coefficient	.664**	1.000
		Sig. (2-tailed)	.000	.
		N	69	69

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

Source: Field work, 2023.

The relationship between Lean Inventory System and operational effectiveness is revealed to be significant given the observed correlation 0.664** and a p-value of .000 which is less than 0.05 (table 2). The correlation value shows a strong and significant relationship between both variables at a 95% confidence interval; implying that the more an organization apply strategic supplier partnership, the higher the higher the level of operational effectiveness. This is supported by a correlational value of 0.664 revealing a direct relationship between strategic supplier partnership and operational effectiveness. Based on this outcome, the hypothesis of no significant relationship between Lean Inventory System and operational effectiveness of Beverage food companies in

Rivers State **(**Null) hypothesis is rejected based on the decision rule of $P < 0.05$. We therefore accept the alternative hypothesis and restate the null that strategic supplier partnership is significantly related to increase in operational effectiveness.

5. Conclusion

From the findings of the study, the study concludes that Lean inventory management positively relates with supply chain performance of food and beverages firms in Rivers State.

6. Recommendation

Based on the findings of this study, the following recommendations are made:

i. Managers of food and beverages firms should Lean inventory management to enhance their supply chain performance

ii. Food and beverages firms should focus on improving their lean inventory to improve their supply chain performance

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