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**INVENTORY CONTROL AND OPERATIONAL EFFICIENCY OF HOTELS IN PORT  
HARCOURT METROPOLIS**

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**Abstract**

This study sought to investigate the impact of inventory control on operational efficiency of Hotels in Port Harcourt Metropolis. Specifically, it examined how inventory control could effect timely service delivery, waste reduction and cost reduction which are the identified measures of operational efficiency. Thus three specific objectives, research question and hypotheses were formulated to guide the study which was domiciled in the Port Harcourt hotel sector. The study adopted the descriptive survey design; and used the cluster sampling technique to draw a sample of three hundred and eighty-five (385) from fifty-five (55) hotels within the sector. Subsequently, seven copies of the research instrument were administered to each of the hotels purposefully; while data was gathered via the use of a five 5 point Likert-like scale questionnaire. The validity and reliability of the survey instrument was guaranteed by conducting confirmatory factor analysis which comprised the assessment of discriminant validity, convergent validity as well as composite reliability and Average Variance Extracted. The hypotheses were analysed using Partial Least Square structural equation modelling (PLS-SEM). The result showed that inventory control possesses a significant positive relationship with operational efficiency as it boasted of beta ( $\beta$ ) values of 0.876, 0.821, 0.804 for timely service delivery, waste reduction and cost reduction respectively. Consequently, hotel managers were urged to design and implement suitable inventory control systems that would guarantee optimality in the usage and storage of inventory items since it was shown to have positive impact on operational efficiency. It was also recommended that hotel management should embrace computerized system of managing inventory while maintaining quality relationship with suppliers.

**Keywords:** *Cost Reduction, Inventory Usage, Lean Inventory Theory, Timely Service Delivery, Waste Minimization.*

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**Introduction**

The interest of academics and policymakers around the globe in the operational efficiency of hotel businesses has persisted for many years due to its impact on the financial stability, overall well-being, and long-term survival of these businesses (Oladimeji et al., 2020; Rashmi et al., 2021). Operational efficiency refers to an organization's ability to achieve desired results while minimising the use of resources, delivery time and cost (Porter, 1996). It implies using resources efficiently to benefit the company. The success of a hotel establishment may be attributed to the optimal use of its available resources. Research conducted by Amahalu et al. (2018), Eniola and Oshi (2022) and Folajimi et al. (2020) has shown that inventory is a significant resource in hotel organisations. Hence, the capacity of hotel businesses to effectively fulfil customers' requirements by providing high-quality products (such as food and beverages) and services (accommodation); minimising inefficiency, and decreasing delivery time demonstrates a commendable operational performance (Ashraf & Muhannad, 2017). Hence, corporations use certain measures to guarantee that the appropriate amount and quality of products are maintained within the organisation at the right time and lowest feasible cost (Gbadamosi, 2016).

Inventory is a significant component of a business's current assets and accounts for a substantial part of cost in manufacturing and trading organisations, particularly the hotel industry. In this industry, inventory items have a short shelf life and require specialised equipment and energy supply for proper storage (Ibo & Akindutire, 2020; Vipulesh, 2015). Vipulesh (2015) highlighted that the quality of a product is determined by the materials and inputs utilised, as well as the

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technology used during its production. This premise is founded on the notion that even with the use of cutting-edge technology (Folajimi et al., 2020), the final product would still be flawed if substandard, spoilt or contaminated components are used in the processing. Effective inventory management systems are therefore crucial for attaining operational efficiency in a normal hotel business. Inventory utilised for manufacturing plays a vital role in ensuring quality, timely delivery and cost effectiveness. Nevertheless, without an implemented strategic inventory management system, this aim would remain an unattainable and hypothetical aspiration (Ismail & Halima, 2022; Oladimeji et al., 2020).

Inventory control is the systematic management of stock levels in a firm, with the goal of meeting customer demand promptly and minimising the expenses related to stockholding (Otuya & Eginwin, 2017). The successful use of efficient inventory management methods to get superior and enduring financial and operational results is often contingent upon the specific circumstances in which the hotel functions. Empirical observations (Mitaire & Jones, 2022; Orobia et al., 2020; Rashmi et al., 2021; Timothy et al., 2013) have demonstrated that hotels in developed economies such as Japan, China, the United Kingdom, and the United States have successfully implemented robust inventory planning and control systems to improve their operational efficiency over time. Unfortunately, inventory management solutions are still underutilized in Nigeria and other African countries when it comes to achieving optimum operational efficiency. This is because insufficient control over purchase, consumption, and storage frequently impedes inventory planning and control. The main problem stems from a deficiency

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in trust between suppliers of inventory and businesses, as well as among the employees of an organization responsible for ordering and managing inventory (Gbadamosi, 2016). This issue requires immediate attention amongst the hotel industry players.

The problem considered in this research arises from the fact that operations managers in hotel enterprises often encounter challenges related to inventory management, particularly in the context of frequent stock shortages, food quality, costs associated with inventory holding, and punctual delivery. This difficulty often leads to customer service delays, poor sensory quality of food and higher operating costs. The situation is further complicated by unreliable power supply, intensified fuel costs for alternative energy sources and an upward trajectory of inflation for inventory items. Hotel managers find themselves at a crucial decision point. While maintaining a large inventory might lead to cost savings and faster delivery, it can also result in losses owing to spoilage and theft caused by unreliable power supply and weaknesses in the control system. Conversely, insufficient inventory may lead to supply shortages, extended waiting times for guests, and poor service delivery. Regardless, hotels face the predicament of seeing a decline in income owing to service failures, which may result in poor ratings, loss of customers and ultimately, the demise of the company. Inventory mismanagement poses a significant risk to the long-term profitability and survival of hotel facilities, as shown by research conducted by Rashmi et al (2021) and Shenvi (2019). It is concerning that the hotel industry, which heavily depends on inventory and is vulnerable to theft, expiration and spoilage, has not recognised the importance of implementing effective inventory control measures, despite the increasing trend of

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inflation. This has been observed by operations leaders and management experts (Ibo & Akindutire, 2020). Conversations on inventory management mostly take place in the manufacturing sector and are predominantly focused on financial performance (Ismail & Halima, 2022; Mitaire & Jone, 2022; Orobia et al., 2020). The absence of this crucial discussion in hotel establishments is concerning. Furthermore, most of these studies investigated the relationship between inventory control and financial performance (Almrdof & Attia, 2021; Muiruri & Ochiri, 2019; Eniola & Oshi, 2022). They are primarily conducted in industrial locations such as southwest Nigeria (Lagos, Ogun and Ibadan) (Oladimeji et al., 2020; Folajimi et al., 2020) and southeast Nigeria (Abia and Anambra) (Amahalu et al., 2018; Orobia et al., 2020). The regions of Northern Nigeria, namely Kano and Borno, have been studied by Ismail and Halima (2022), Ashraf and Muhannad (2017); and Mitaire and Jones (2022). Literature of this kind is scarce in hotel establishments in the south-south region, particularly in Port Harcourt (Eniola & Oshi, 2022). Hence, the issues of inventory management in the hotel business may arise due to a lack of information in existing literature. This calls the attention of scholars and experts to rise up to the task; a course which this study sought to champion. Hence, this study aimed at examining the relationship between inventory control and operational efficiency of hotels in Port Harcourt metropolis. It adopted timely service delivery, waste reduction and cost reduction as the measures of operational performance. This gave rise to three specific research questions and hypotheses which guided the study. Thus, the specific objectives of the study were to provide empirical explanations to the following research questions:

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**Research Question1:** What is the relationship between inventory control and timely service delivery of hotels in Port Harcourt Metropolis?

**Research Question2:** What is the relationship between inventory control and cost reduction of hotels in Port Harcourt Metropolis?

**Research Question3:** What is the relationship between inventory control and wasteminimization of hotels in Port Harcourt Metropolis?

In line with the research questions, it was hypothesized that:

**$H_0:1$**  There is no significant relationship between inventory control and timely service delivery of hotels in Port Harcourt Metropolis.

**$H_0:2$**  There is no significant relationship between inventory control and cost reduction of hotels in Port Harcourt Metropolis.

**$H_0:3$**  There is no significant relationship between inventory control and waste minimization of hotels in Port Harcourt Metropolis.

The essence of all academic rigour is to tackle societal challenges and provide lasting solutions to them. This study therefore is expected to benefit the academic community, managers and experts in hospitality management and the general public. Firstly, it will enable managers to devise strategies for controlling their inventory more efficiently and effectively towards better performance. The study would also provide practical strategies to preventing inventory pilferage, spoilage and inappropriate use which are predominantly inherent in hospitality firms. The study

would also help to managers to prioritise adequate balance between several inventory items (raw material, work in progress and finished good) in order to achieve cost reduction and production efficiency. Moreso, the outcome of this research will serve as a reference material to future researchers in the domain of inventory management. The macro analysis approach of the study shall aid policy makers and experts in developing policies and regulations that will guide inventory management practices of hotels in order to achieve maximum efficiency in operations. The scope of the study at the content level was streamlined to the identified proxies of the independent variable - Timely Service Delivery, Cost Reduction, Waste Minimization; as well as the dependent variable - Inventory Control. Geographically, the study was domiciled in the Hospitality sector of Port Harcourt metropolis, Rivers State, Nigeria. The unit of analysis was at the macro level since it involved the management of several hotel organizations.

## Literature Review

**Theoretical Foundation:** The underlying theory for this study was the *Lean Inventory Theory*. The development of lean theory stemmed from contemplation on the integration of production processes. Lean inventory theory, an extension of Just-in-Time, is a philosophy of inventory management that emphasises the need of maintaining minimal inventory in accordance with production requirements (Eroglu & Hofer, 2011). The theory was founded on the idea of sustaining minimal inventories within an organisation. The lean inventory theory aims to minimise costs in an organization's inventory system by making choices related to production, storage and the whole supply chain (Troxell, 2015). Jolla (2014) stated that the Lean theory is

based on the concept of Economic Order Quantity (EOQ), which aims to optimise inventory levels by identifying the most suitable order quantities over a certain period of time. The theory highlights the potential for the operating system used to monitor inventory levels and different inventory items to be dynamic and adaptable to changing requirements. The application of lean theory has been extensively used in the fields of engineering, inventory management and supply chains. Rashmi et al (2021) contended that using lean theory is crucial for achieving greater performance. The lack of efficient inventory management is a significant issue encountered by business sectors in developing nations like Nigeria, particularly in the hospitality sector. A large proportion of these enterprises do not use even the fundamental ideas and procedures of inventory control (Wangari, 2015). The lean theory is criticised for its need of a tight and long-term cooperation and information exchange between a corporation and its trade partners. This research supports the idea that such collaboration is necessary for the use of lean theory. Therefore, the lean inventory theory was used to provide theoretical elucidation for the theme of this research. This decision was based on the need to analyse the impact of inventory management on operational performance, thereby requiring a cautious approach to inventory control.

### **Conceptual Clarifications**

A fairly detailed discussion of the major concepts of this study has been presented below. This is to enable the reader have a fair grasp of the concepts as they pertain to the study.



**Inventory Control:** Inventories comprise semi-finished products, finished goods, and unprocessed materials (Otuya & Eginwin, 2017). These components are upheld by organisations in order to guarantee a smooth manufacturing operation. Inventory control, alternatively referred to as stock control, encompasses the operational process through which an organisation ensures the maintenance of an ideal stock quantity to promptly satisfy consumer demand while minimising the costs associated with stock holding. According to Ajao (2023), inventory control is a collection of strategic actions executed by the operations manager of a business organisation. Its purpose is to guarantee the availability of an adequate quantity of inventory items to facilitate the company's operations in an efficient manner, while also considering cost and optimal utilisation. This procedure involves the surveillance of inventory storage, utilisation, and movement. Additionally, it empowers the company to satisfy customer demands and attain financial elasticity by establishing appropriate internal and production controls (Kilonzo et al., 2017; Otuya & Eginwin, 2016). There are numerous inventory control strategies available for implementation by businesses, which can lead to cost reduction and, as a result, increased profitability. Scholars have categorised these control measures into three classifications (Folajimi et al., 2020; Ismail & Halima, 2022) – control over inventory procurement, control over inventory security and storage, as well as control over inventory utilisation.

**Inventory Procurement Control:** Organisations acquire or create inventories internally in order to manufacture a range of goods. Organisations may still need to get components outside when they need to make items in-house for quality concerns. Under such circumstances, it is important to

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establish procurement procedures that evaluate the robustness and reliability of suppliers, anticipate and ascertain future inventory needs, and cultivate strong negotiation skills, among other goals (Folajimi et al., 2020; Ismail & Halima, 2022). Procurement control methods include strategic methodologies such as material requirement planning and establishing strategic alliances with suppliers (Folajimi et al., 2020; Ismail & Halima, 2022). According to Timothy et al. (2013), supplier partnership is a strategic agreement between companies that aims to develop a mutually beneficial relationship. According to the given definition, the strategic vendor partnership emphasises the necessity of cultivating good working relationships between suppliers and customers via cooperation rather than confrontation. The concept of "Strategic Suppliers Partnership" originated in the 1980s when corporations began adopting the Just-in-Time manufacturing approach. The objective of this method was to reduce waste, decrease the time it takes to produce products, and provide suppliers more flexibility and simplicity in supplying main components. On the other hand, material requirement planning is an inventory control approach that utilizes a backwards method from the planned sequence of quantities and specifications of desired dates for finished products in a master production flow plan to ascertain the essential inventory components required to fulfil the organization's production plan (Raymond et al., 2015). Procurement/material requirement planning, as defined by Caroline et al (2017), encompasses the entirety of the inventory acquisition process. It commences with an organization defining and specifying its inventory requirements, as well as determining the procurement need beforehand.

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*Inventory Storage/Security Control:* Hotels often handle inventory for three primary purposes: production (for food and beverages), resale (for drinks), or consumption (such as maintenance inventories). Hotel managers must prioritise the implementation of inventory security and storage procedures to effectively prevent the loss, abuse or degradation of goods. Effective inventory management is crucial for hotels as it helps prevent financial losses and hurdles in the manufacturing process that may occur due to inventory theft resulting from insufficient security measures (Ismail & Halima, 2022). To safeguard inventory within the organisation, hotel managers must build a formal and regulated control framework (Benjamin & Daniel, 2016). If inventory handlers and storage experts are able to provide internal inventory security, this will establish a documented system for transferring inventory within the business (Folajimi et al., 2020; Troxell, 2015). Jolla (2014) outlines many internal measures that organisations use to protect their inventory, including maintaining detailed records, using sequential and procedural stock marking, conducting stock taking, implementing documented procedural stock audits and surveillance, and implementing stock checking methods.

*Inventory Usage Control:* Organisations in the hotel industry stockpile goods for use in future production runs. How a firm makes use of its inventory depends on the nature of the demand it faces and its position in the market. While some businesses may only have what they need to manufacture a given item, most try to have a little extra on hand just in case. The purpose of this is to keep operations process running smoothly until the desired supplies are obtained. Safety/Buffer Stocks and Just-in-Time are two of the most popular inventory utilisation controls.

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Just-In-Time (JIT) refers to an approach to production and inventory management that uses organisational tactics to reduce stock wastage. The main objective is to acquire the required supplies for the production of certain goods as effectively as possible (Cynthia & Amuhaya, 2015). When it comes to inventory management, the just-in-time method is all about having the right supplies on hand at the right moment in order to make a certain amount of items. In order to prevent shortages caused by factors like delivery delays, inaccurate inventory estimates, differences between ordered and delivered supplies, and price variations, businesses maintain what is known as "safety stock" (Anichebe, 2013). Because demand is so difficult to forecast, Anichebe (2013) said that one of the biggest obstacles to effective inventory management is determining an appropriate buffer stock due to sales; and this is particularly true in the hotel industry. In order to keep up with the organization's consumption pattern of inventories, hotel management must carefully determine the proper amount of safety inventory to maintain. Consumption statistics from the past or consumption predictions for the future are common sources for this evaluation.

### **Concept of Operational Efficiency**

When a business is able to produce goods or provide services with little wastage and maximum production outcome; it is said to have achieved operational efficiency (Gupta & Jain, 2014). Operational efficiency is the degree to which a company's production systems and procedures are planned and executed to maximise output while minimising cost, time and effort. In line with this definition, Ajao (2023) argued that streamlining a company's key processes may help them

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adapt more effectively to the ever-changing market. Rashmi et al (2021) used the manufacturing sector as an instance to aver that operational performance allows business units to minimise waste and increase value generation. Consequently, operational performance shows how well an organisation uses its resources to achieve its goals. While effectiveness is concerned with reaching organisational objectives, efficiency is concerned with the time and resources needed to complete a certain activity. Timely service delivery, waste reduction and cost reduction were the three parameters used to measure operational efficiency in this study.

**Timely Service Delivery:** The term "timeliness" denotes the attribute or quality of transpiring or being executed at a moment that is suitable, expected or appropriate (Ajao, 2023). It is the capacity to adhere to schedules, meet deadlines, or complete tasks within a reasonable timeframe. Within the realm of conventional hotel operations, timeliness can pertain to the punctual delivery of goods or services to guests, adherence to anticipated deadlines, and the expeditious preparation and availability of services or products to satisfy guests' demands. Hotel service delivery in a timely manner pertains to the establishment's capacity to furnish visitors with services and products in accordance with predetermined time constraints (Xie & Yan, 2013). Guests' satisfaction is of the utmost importance and has the potential to greatly influence the overall experience of a visitor. Hotels that ensure the expeditious provision of services and products consistently exhibit their dedication to the comfort and convenience of their guests, thereby enhancing the overall guest experience (Kandampully, 2006; Xie & Yan, 2013). Delivery in a timely manner is frequently correlated with effectiveness, efficiency, and

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steadfastness. Maintaining punctuality is an essential element of professionalism and effective organisational procedures, particularly in hotel establishments where guests are pressed for time. As a result, the operational efficacy of hoteliers can be assessed in terms of their capacity to minimise the duration of visitors' waiting time.

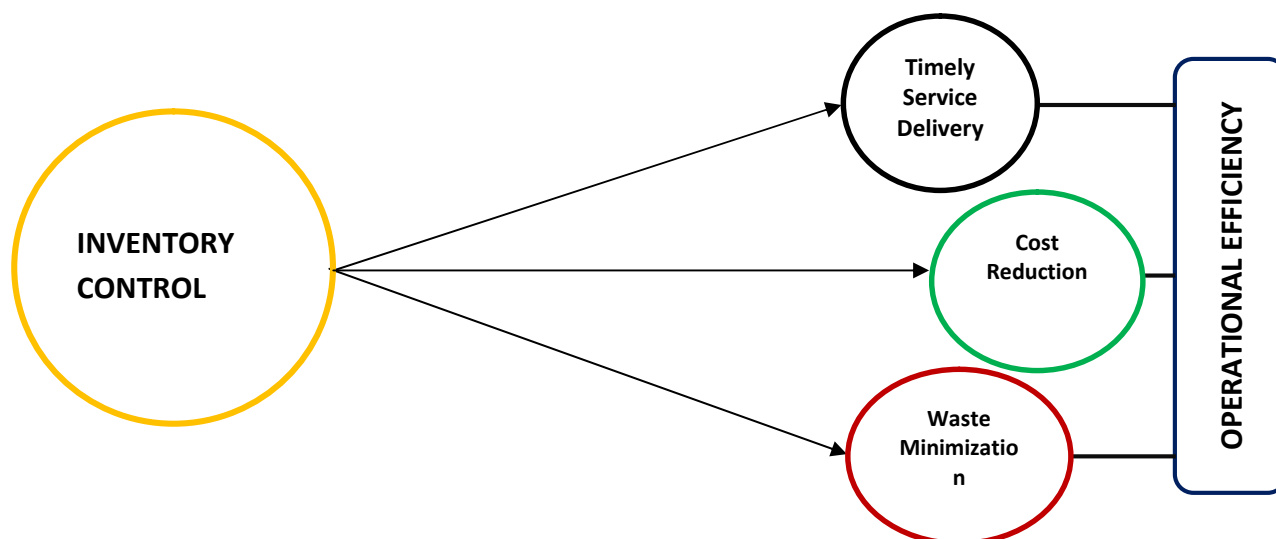
**Cost Reduction:** Cost reduction is defined by Hongren et al (2015) as the decrease in the unit cost of products or services while maintaining their suitability for their intended purpose. Cost reduction is a managerial and business strategy approach that seeks to reduce the outlays and costs associated with production or provision of products and services by organisations. Minimizing cost without compromising or improving the quality of products or services is how cost reduction achieves its main goal of increased profitability. In a competitive industry such as the hotel industry, reasonable costs must be incurred, and management must ensure the prudent and effective utilisation of resources in order to meet the established benchmarks. Successful cost reduction enables an organisation to offer its product at a lower price than its rivals while maintaining the same level of quality. Price competitive advantage, according to Lockey (2002), enables a business to generate profits, expand its market share and attain market leadership.

**Waste Minimization:** This pertains to the knowledge and implementation of techniques designed to minimise waste generated during production processes. Waste minimization, as it pertains to hotel enterprises, is the ability to reduce waste generation and the ecological impact associated with garbage disposal (Ajao, 2023). It involves implementing strategies and initiatives that aim to reduce waste generation, promote resource reuse, encourage recycling and ensure

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sustainable garbage management. Waste reduction is a critical component of the environmental concern and sustainability of the hospitality industry. The first step is to identify and eliminate or reduce sources of waste production within a hotel (Wilhide et al., 2006). In addition to reducing environmental impact, hotel waste reduction may result in cost savings through decreased garbage disposal costs and increased operational efficiency. Additionally, this trend aligns with the growing preference of environmentally conscious clientele for hotels that demonstrate sustainable initiatives (Gossling et al., 2013). Waste reduction at various stages of production involves the elimination of defective products, inefficient inventory consumption and misuse of basic materials.

The main concepts of this study as discussed in the conceptual clarifications have been captured in a diagrammatic framework as shown in figure 1.



**Figure 1: Diagrammatic Model of the Study Variables**

**Source:** Researchers' Conceptualisation based on the Identified Variables of the Study

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**Empirical Literature**

A study was undertaken by Ismail and Halima (2022) to examine the relationship between inventory management and financial performance of industrial companies that are publicly traded in Nigeria. The primary emphasis of their investigation was the administration of inventory control within the selected enterprises. The study was centred on the examination of how inventory management affected the financial performance of manufacturing companies listed in Nigeria. The study examined the financial performance implications of inventory procurement control, inventory security control, and inventory use control. Data for the study was collected through a combination of primary and secondary sources. The research population comprised manufacturing enterprises that were duly registered in Nigeria over a decade-long period, specifically from 2011 to 2020. An intended sample of 200 employees hailing from the finance and retail departments completed the structured questionnaire. Using the enumeration method, secondary data were acquired. 170 copies of questionnaire, or 85% of the total surveys instrument sent out, were retrieved. The hypotheses were assessed through the application of inferential statistics. Their findings showed that effective inventory management has a substantial positive effect on the financial performance of publicly traded industrial companies in Nigeria. It was recommended that managers strengthen their strategic partnerships with suppliers and deploy resilient automated security protocols to oversee the movement of products across the entire organisation. On their part, Folajimi et al (2020) stated that inventory accounts for a major portion of production costs incurred by companies. This study looked at publicly listed



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conglomerate firms in Nigeria and how inventory control levels affected their financial performance. The study used a mixed-methods approach, combining empirical survey research with fieldwork. In order to provide a structured questionnaire, 72 participants were chosen using quota sampling techniques. According to the results, financial performance of publicly listed conglomerate firms in Nigeria is greatly affected by inventory management.

Conflicting and unclear findings from studies in several nations, including Nigeria, motivated Abubakar et al (2019) to look at how inventory management affected the bottom lines of several Nigerian publicly listed corporations. Using a purposeful selection strategy, the study adopted multiple regressions analytical technique to analyse the secondary data gathered from the audited books of the selected firms. Results showed that inventory turnover ratio has a beneficial effect on the bottom lines of the companies used for the study. Similarly, Agu et al (2016) set out to determine how inventory management affected the operational performance of a subset of manufacturing enterprises. The study set out to assess the impact of Just-in-Time on the expansion of a cross-section of manufacturing companies, as well as the existence of a relationship between demand management and customer satisfaction. Using Taro Yamane's technique for sample size determination, a sample of 285 was chosen from a total of 996 participants in the research. Surveys and one-on-one conversations were the main tools for gathering data. Statistical analyses were conducted using the Pearson product moment correlation coefficient and basic linear regression techniques. According to the results, inventory management has a major impact on how efficient the manufacturing companies were at running

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their operations. Moreso, the level of customer satisfaction was directly correlated to the use of demand management strategies; as growth has been significantly impacted by the Just-in-time technique. The study concluded that every company's success depends on its inventory management practices. Hence, companies should invest in inventory control management training for their staff so they can better oversee inventory management processes. On a contrary note however, Cynthia and Amuhaya (2015) investigated sugar producing enterprises in Kenya's western sugar area, so as to ascertain how inventory management affected the efficiency of their procurement functions. Specifically, the study's objectives were to find out how sugar producing companies in Kenya's western sugar region fared operationally after implementing lean inventory systems, Just-in-Time (JIT) methodologies, making good use of technology, and forming strategic supplier partnerships. A descriptive research strategy based on survey data was used in the study; while a self-administered questionnaire made data collection quite easy. The study adopted analysis of variance (ANOVA) to ascertain the connection between the adoptions of technology for inventory management by western sugar companies' and their return on equity. The result demonstrated that there is no statistically significant relationship between technology adoptions for inventory management and financial performance.

### **Methodology**

The cross-sectional survey design was adopted for this study; and data was sourced primarily using a 5-point Likert-like scale instrument. The target population comprised registered hotels within Port Harcourt Metropolis; which according to Hotels.ng (2023) amounted to two hundred

and eighty (280). To determine the sample size, the Krejcie and Morgan's (1970) technique of sample size determination at 5% significance level and 90% population proportion was adopted. This resulted in 55 hotels which were selected using cluster sampling technique because the hotels are proximally located within the Aba road, Ikwerre Road, Government Residential Areas, Stadium Road, Old Port Harcourt town, Ada-George Road and Diobu areas of Port Harcourt; all within Obio/Akpo local government area of Rivers State. Subsequently seven copies of the survey instrument were administered to each of these hotels making the sample size a total of three hundred and eighty-five (385) across the hotels. Nevertheless, considering the sensitive nature of this research, it was imperative to restrict the study's sample frame to participants deemed knowledgeable and experienced in the field. To this end, the management teams of the different sections of the hotel that rely on inventory items for operations (Bar, Housekeeping, Kitchen, Store and Restaurant) were chosen using the purposive sampling technique.

To ensure the instrument's validity, professionals in the field examined several copies and offered feedback on each. These suggestions were considered and included into the final version of the survey thereby ensuring its face validity. By using confirmatory factor analysis (CFA), it was determined that the study instrument met the criteria for convergent and discriminant validity as suggested by Bagozi et al. (1991) and Hair et al. (2014). Cronbach's alpha value and composite reliability were used to ensure the instrument's reliability. Data analysis was conducted using Partial Least Square Structural Equation Modelling (PLS-SEM). According to Hair et al (2014), PLS-SEM which is a multivariate data analysis approach that searches for

linear correlations between many independent variables and multiple dependent variables. This method was deemed fit for processing the data since it allows researchers to estimate complex models with diverse constructs and structural pathways as is the case here.

### Analysis and Results

This section dealt with the analysis of data including the demographic attributes of respondents, assessment of measurement/instrument model which gave insight on how satisfactory the validity and reliability of the instrument are; and lastly the assessment of the structural model, which helped in making inference on the relationship between inventory control and measures of operational efficiency. A total of three hundred and twenty-three (385) copies of the questionnaire were administered; three hundred and forty-nine copies (349) were retrieved; giving rise to 90.6% response rate. Out of this number, three hundred and two (302) copies were found to be useful for the analyses, resulting to a 78.4% valid response rate.

**Table 1: Demographic Attributes of Respondents**

Variables	Categories	Frequency	Percentage (%)
<b>Gender</b>	Male	178	59
	Female	124	41
<b>Years of Experience</b>	1 to 5 years	66	22
	6 to 10 Years	154	51
	11 to 15 Years	55	18
	15 Years and above	27	09
<b>Designation</b>	Head of Department	154	51
	Procurement Manager	100	33
	Account /Audit Staff	48	16

*Source: Survey Result Computations, 2023*

Table 1 shows the demographic details of the respondents. It showed that 59% of the respondents were male while the remaining 41% were females. Another notable insight that could be derived from this analysis is the respondents' years of experience and official designation. The result revealed the respondents are predominantly experts on the subject matter as most of the respondents (78%) have over 5 years of experience while over 51% were heads of departments in the hotel organisation that deals with inventory usage for their routine operations. Furthermore, the study also included procurement, account and audits staff to ensure balance of response. This boosted the researchers' confidence that respondents would provide objective responses to the questionnaire items.

### **Assessment of Measurement Instrument/Model**

By assessing the measurement instrument for this study, the researchers sought to determine the suitability of the research instrument for this study. To achieve this, both the reliability and validity of the instrument was conducted through CFA analysis which is an integral part of a structural equation modelling (SEM).

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**Table 2: Descriptive Statistics and Assessment of Measurement Model**

Constructs	Item Scale	Mean	S.D	Loadings	Cronbach Alpha	CR	AVE	Sq. Root of AVE
<b>Inventory Control</b>	We often review stock level	3.54	1.071	<b>0.882</b>	<b>0.807</b>	<b>0.901</b>	<b>0.662</b>	<b>0.814</b>
	We monitor the storage and use of inventory	3.59	.982	0.718				
	We have a real time information on the level of stock-in hand	3.64	.884	0.701				
	Employees show evidence of inventory requisition before receiving raw materials or any other inventory item	3.80	.918	0.911				
	We maintain a detailed record of all inventory items from the procurement stage to final usage	3.56	.905	0.835				
<b>Timely Service Delivery</b>	Our service delivery time has improved significantly.	3.80	.918	<b>0.902</b>	<b>0.725</b>	<b>0.916</b>	<b>0.688</b>	<b>0.839</b>
	*We often experience delay due to material unavailability.	3.59	.982	0.776				
	We maintain some stock in order to be on a safe side.	3.54	1.071	0.761				
	We have a maximum waiting time to attend to customers' demand	3.16	1.141	0.879				
	We mostly meet-up with the time limit set for service delivery	3.51	.884	0.819				
<b>Cost Reduction</b>	*Our operating cost has increased recently.	3.87	.693	<b>0.811</b>	<b>0.842</b>	<b>0.907</b>	<b>0.659</b>	<b>0.812</b>
	*We often stock more than we needed for production.	3.79	.824	0.728				
	* We incur high cost of energy to preserve inventory.	3.68	.659	0.714				
	We practice lean approaches towards inventory management to reduce operations cost.	3.86	.722	0.802				
	* We often spend more on transport because our orders are frequent	3.67	.631	0.980				
<b>Waste Minimization</b>	* Our raw materials often get spoilt in the store.	3.80	.918	<b>0.702</b>	<b>0.801</b>	<b>0.896</b>	<b>0.632</b>	<b>0.795</b>
	We have standard recipe for inventory usage.	2.36	.690	0.730				
	We return unused or excess materials back to the store.	3.57	.934	0.814				
	We check inventory condition regularly.	3.64	.919	0.809				
	We have waste management performance indices.	3.54	1.013	0.905				

Source: Researchers' Computation, 2023.

The descriptive analysis and assessment of the study's measurement model has been presented on Table 2. The result unveiled the average score and standard deviation of the elements comprising the questionnaire for every construct. The outcome demonstrated a high mean value, suggesting that the majority of respondents concurred with the questions. Additionally, the standard deviation accurately assessed the variability or spread of the responses, which was deemed satisfactory. This suggests that the selected samples sufficiently reflected the entire population under investigation (Dauglas & Marting, 2005; Mary, 2008). Additionally, the results of the measurement assessment analysis predominantly confirmed the study's convergent and discriminant validity. In the first place, the CFA analysis revealed that all items comprising the research instrument possess factor loadings that exceed the minimum threshold of 0.70, as proposed by Fidell and Tabachnick (2007). Furthermore, all of the average variance extracted (AVEs) exhibited values that were comparatively high, surpassing the threshold of 0.5 as recommended by Bagozzi and Yi (2012) and Hair et al. (2014). As a result, the convergent validity was deemed adequate. In a similar vein, the composite reliability (CR) for inventory control, timely service delivery, cost reduction and waste minimization exhibits high values of 0.901, 0.916, 0.907 and 0.896 respectively. The obtained outcome demonstrates that the research instrument is reliable, as it meets the minimum requirement of 0.8 as proposed by Fornell and Lacker (1981) and Nunnally (1978). However, the Cronbach alpha values provided further evidence of the study instrument's internal consistency, since the entire alpha values were over the minimal level of 0.7.

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**Table 3: Correlation Matrix Showing the Discriminant Validity of the Study Constructs**

Constructs	Inventory Control (IC)	Timely Service Delivery (TDS)	Cost Reduction (CR)	Waste Minimization (WM)
IC	<b>0.814</b>			
TDS	0.703	<b>0.839</b>		
CR	0.539	0.586	<b>0.812</b>	
WM	0.545	0.672	0.711	<b>0.795</b>

**\*The Square root of Average Variance Extracted (AVES) on the Diagonal**

**Source:** Researchers' Computation, 2023

The correlation matrix of each construct comprising this investigation was presented on Table 3. The outcome demonstrated the values of construct-to-construct correlations as well as the diagonal square roots of AVEs. The results of the analysis indicated that the cross loadings (correlations) indicated that specific items have a more pronounced association with their own construct compared to other items. Furthermore, it discloses the degree of linear correlation between each pair of the variables. The discriminant validity is deemed adequate, as indicated by Hair et al. (2014), since the square roots of AVEs on the diagonal are greater than their respective correlation values. It can be guaranteed that every individual construct is unique and does not consist of identical indicator items (Ndu & Ajao, 2019).



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**Assessment of Structural Model and Hypotheses Testing**

**Table 4: Structural Path Model and Hypotheses Results**

S/N	Hypothesized Path	Path Coefficient (β)	P-Value	Standard Error	T Statistics	Decisions
<i>H<sub>0</sub>:1</i>	IC → TSD	0.876***	0.000	0.043	9.676	Not Supported
<i>H<sub>0</sub>:2</i>	IC → CR	0.804***	0.000	0.032	5.773	Not Supported
<i>H<sub>0</sub>:3</i>	IC → WM	0.821***	0.000	0.058	4.692	Not Supported

\*\*\*P<0.001    \*\*P<0.01    \*P<0.05

Source: Researchers' Computation (2023) from Path Analysis Result (Aided by SMARTPLS 4.0.9.9)

The outcomes of the structural model and hypotheses testing are presented on Table 4. The result indicated that a significant relationship exists between the study's constructs. It demonstrated that each path representing a different hypothesis in the structural equation model has a significant positive relationship. More precisely, the analysis unveiled that inventory control exhibits a substantial positive correlation with timely service delivery, cost reduction and waste minimization, as evidenced by the beta (β) values of 0.876, 0.804 and 0.821 respectively. As indicated by their respective R<sup>2</sup> values, these results suggest that inventory control can influence timely service delivery, cost reduction and waste minimization by as much as 76.7%, 64.6% and 67.3% respectively. The remaining respective (1-R<sup>2</sup>) values of 23.3%, 35.4% and 32.7% are accounted for by other exogenous factors not accommodated in the model. The result equally demonstrated a negligible degree of standard error, confirming that the selected samples sufficiently represented the entire study population (Dauglas & Marting, 2005; Mary, 2008). The outcome was additionally illustrated in the study's structural model as shown in figure 2.

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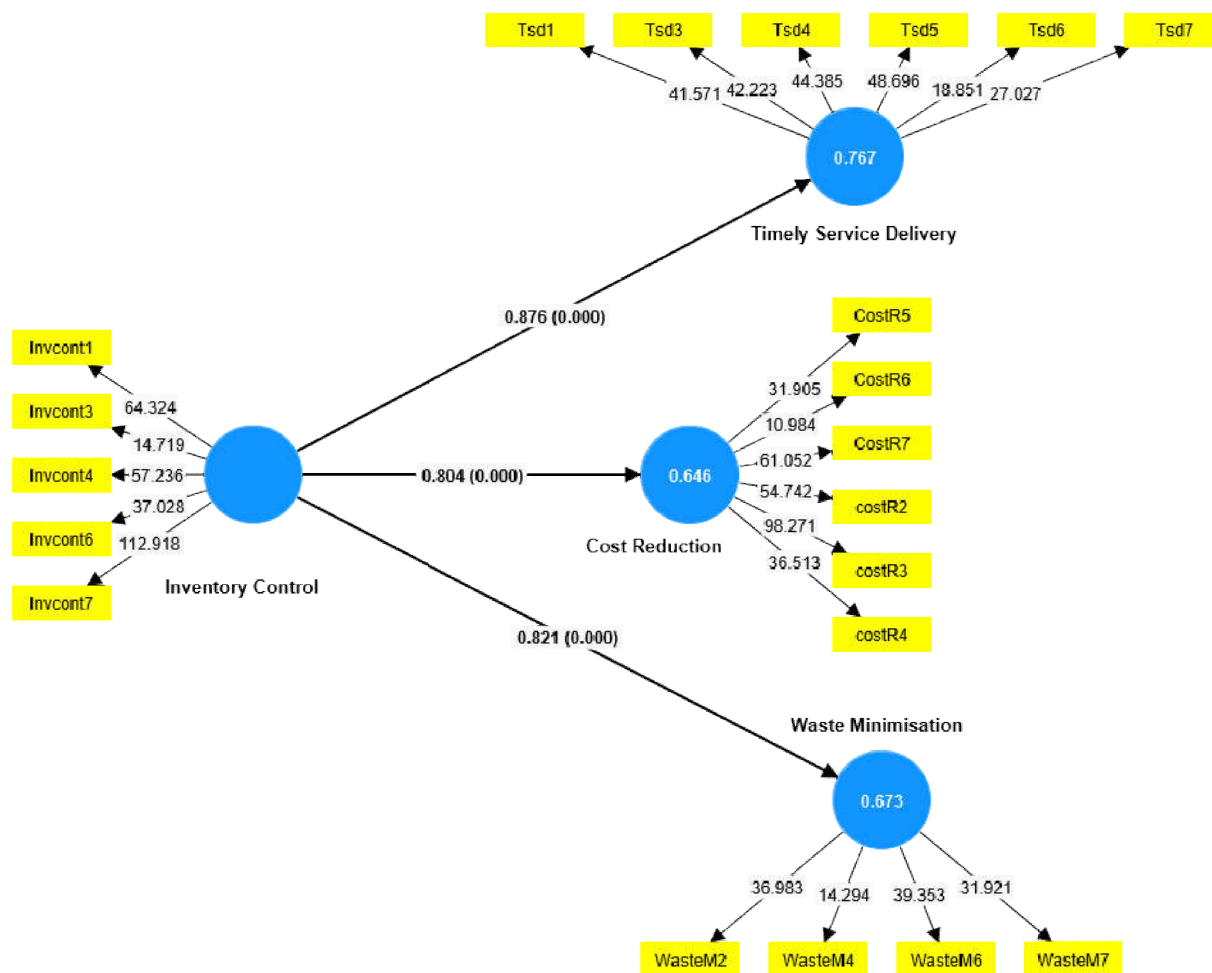
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**Figure 2: Structural Model of the study with Hypotheses Results**  
 Source: SEM Analysis Results, 2023; (Aided by SMART PLS Version 4.0.9.9).

**Discussion of Findings**

The results revealed a statistically significant positive relationship between inventory control and operational efficiency, as shown by the beta ( $\beta$ ) coefficients of 0.876, 0.804 and 0.821 for timely

service delivery, cost reduction and waste minimization respectively. The inferences derived from these results are reasonable, given that they corroborate previous empirical discoveries. For instance, the study of Ismail and Halima (2022) which revealed that inventory control has a substantial and beneficial effect on the financial performance of publicly listed industrial enterprises in Nigeria. Folajimi et al (2020) reported similar findings and came to the same conclusion, that inventory management significantly affects the financial performance of conglomerate corporations listed in Nigeria. The result equally aligns with the findings of Abubakar et al. (2019), who examined the correlation between inventory control and the financial performance of a selection of publicly listed firms in Nigeria. Their findings showed that inventory turnover ratio had a significant and favourable impact on the financial performance of some publicly traded firms in Nigeria. Support was also found in the work of Agu et al (2016) who found that inventory control significantly affects the efficiency of manufacturing organisations. On a contrary note however, the study conducted by Cynthia and Amuhaya (2015) revealed no association between the use of inventory control systems and the return on equity of Western sugar businesses operating in Kenya.

### **Implications of the Findings**

Based on the findings of this research, it is imperative that hotel management prioritise inventory control in an effort to enhance operational performance. This underscores the necessity for implementing rigorous policies that would effectively guarantee the minimization of inventory wastage and costs while maintaining the highest standards of service quality and timely service

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delivery to guests. This study has demonstrated that inventory control extends beyond mere inventory recording. Consequently, personnel working in the hotel industry, including experts, operations managers, accountants, auditors, and consultants, must diligently monitor inventory throughout its entire life cycle. The research has additionally imposed an obligation on operations managers to oversee heads of departments concerned with inventory usage and inventory officers in order to verify that all requests for inventory items adhere to established protocols and guidelines. This is to ensure that only the appropriate quantity of inventory is requested and utilised prudently. In doing this, they should bear in mind that the coefficient of determination of these findings indicate predictive capacities of 76.7% for timely service delivery, 64.6% for cost reduction and 67.3% for waste minimization leaving their respectively remaining 23.3%, 35.4% and 32.7% to external factors not accommodated in this study's model. This implies that there may be other factors that must be of concern for higher levels of predictability to be achieved. For instance, there are many factors that affect costs like rising cost of energy, inflation, security challenges, infrastructural decay and other macro-economic challenges. Hence, it is possible that concentrating just on inventory management would not be sufficient to reduce costs in hotels. Thus, hotel management may need to conduct comprehensive evaluation of supplementary cost factors and other administrative expenditures for them to achieve higher levels of predictability. This implies that while such external environmental factors as government policies/regulations, exchange rate volatility, inflation, macro-economic factors etc., may not be controlled, hotels should endeavour to maintain firm grip over factors

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within their control. Otherwise, achieving their desired levels of predictability as shown in this model might be a mirage.

### **Conclusions and Recommendations**

The findings of this research unequivocally demonstrated that inventory control has a substantial positive impact on the operational efficiency of hotels in Port Harcourt. Specifically, it achieved predictive capacities of 76.7% for timely service delivery, 64.6% for cost reduction and 67.3% for waste minimization. Consequently, it can be concluded that inventory control has a high positive impact on operational efficiency; and can be used to effectively predict it. This means that inventory control could serve as effective strategic management instrument that hotels in the Port Harcourt Metropolis of Rivers State, Nigeria could utilize to enhance their operational efficiency. In light of the study's findings and conclusions, the ensuing recommendations were proposed:

1. Managers of hotels are urged to design and implement suitable inventory control system that would guarantee optimality in the usage and storage of inventory items; since it was demonstrated to have positive impact on timely service delivery and waste reduction. This could be achieved by the use of EOQ model and establishment of adequate buffer stock levels so as to prevent unwarranted delays in fulfilling guest orders due to inventory item unavailability. In doing this, adequate care must be taken; and thorough analysis made in order to prevent excessive stockpiling, which may result in inventory deterioration and losses due to poor storage, theft or misuse.

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2. Proper record on inventory should be maintained all through the inventory life cycle from procurement initiation to usage and replenishment. This would enable hotel management to seamlessly monitor inventory usage; thereby avoiding unforeseen interruptions in operations due to stock out.
  3. Management should ensure that sufficient security measures are implemented to safeguard against inventory loss resulting from unauthorised access to inventory. This can be achieved by the implementation of computerised inventory management systems and the use of closed circuit television (CCTV) cameras.
  4. To further achieve cost reduction, it was suggested that hotel management should curtail other utility and overhead costs; and may combat supplier delays by strengthening relationships and scheduling frequent meetings with suppliers to discuss matters pertaining to inventory acquisition.

### **Suggestions for Future Study**

This study was focused on hotels within Port Harcourt Metropolis; it is not a gainsaying that studies of this nature are still sparing in hotel and hospitality industry. Therefore, future researchers are urged to consider replicating this study in other location within the industry. The study could also be carried out in other hospitality businesses like fast food restaurants, bakeries etc., to know if similar results would be found. Also researchers may consider examining other factors that may moderate the effect of inventory control on operational efficiency such as managerial competence, automation and organisational structure. Lastly, this study adopted a

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cross sectional survey design; researcher may consider conducting future empirical endeavour in this subject matter using a case study/longitudinal approach on a single hotel organisation. This could give in-depth and more peculiar insights which may have not been unravelled by this study.

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