

**ABC INVENTORY CONTROL MANAGEMENT AND QUALITY SERVICE DELIVERY OF SELECTED MANUFACTURING COMPANIES IN SOUTH WEST NIGERIA.**

**Bankole Isaac, AKINROLUYO (PhD)**

[bi.akinroluyo@unizik.edu.ng](mailto:bi.akinroluyo@unizik.edu.ng); 08037509834

Nnamdi Azikiwe University Awka, Anambra State

**Bankole Oluseun Ayodele**

[Oluseun.bankole@federalpolyilaro.edu.ng](mailto:Oluseun.bankole@federalpolyilaro.edu.ng); 08137015753

Federal Polytechnic Ilaro, Ogun State.

**Abstract**

Effective inventory management plays a vital role in ensuring operational efficiency and quality service delivery in manufacturing. This study explores the relationship between Activity-Based Classification (ABC) inventory control and service delivery performance in selected manufacturing companies in South West Nigeria. The research was guided by two research questions, focusing on how the periodic inventory system influences responsive customer support in South West, Nigeria, and how Just-in-Time (JIT) inventory management impacts on-time delivery in South West Nigeria. Anchored on Systems Theory, the study employed a quantitative research design. Data were obtained from 300 purposively selected respondents across inventory, logistics, and customer service departments in the targeted firms. A structured questionnaire served as the primary instrument for data collection. To ensure the validity, the instrument was reviewed by domain experts. A pilot study involving 30 non-sample respondents was conducted to test reliability. The instrument yielded a Cronbach's Alpha of 0.83, confirming strong internal consistency. Data were analyzed using SPSS version 26, applying inferential statistics of Pearson correlation. Results reveal a significant positive relationship between the periodic inventory system and responsive customer support ( $r = 0.856$ ,  $p = 0.032$ ), suggesting that well-managed periodic reviews contribute to improved customer responsiveness. Additionally, a very strong and statistically significant correlation was found between JIT inventory management and on-time delivery ( $r = 0.976$ ,  $p = 0.020$ ), highlighting the efficiency of JIT practices in meeting delivery timelines. The findings underscore the need for manufacturing firms to strategically align inventory management practices with customer service objectives to boost competitiveness and service quality. The study recommends the adoption of technology-enhanced periodic inventory systems and the integration of JIT practices tailored to each firm's operational structure and market demands. These measures are essential for improving responsiveness, reducing inefficiencies, and achieving sustainable service excellence.

**Keywords:** Inventory Control, Just-in-Time (JIT), Service Delivery, ABC Classification

**Introduction**

Efficient inventory management is a cornerstone of operational success and competitive advantage in manufacturing industries across the globe. In Nigeria's South West region, a key industrial hub manufacturing companies face mounting pressure to improve quality service delivery in the face of volatile market demands, infrastructural challenges, and rising customer expectations. One of the fundamental strategies to manage these complexities is the adoption of effective inventory control systems. Activity-Based Classification (ABC) inventory control management, which categorizes inventory items based on their value and usage frequency, is recognized for its ability to optimize inventory levels, minimize waste, and enhance operational efficiency. By assigning

<https://journals.unizik.edu.ng/ujofm>

managerial attention based on item criticality, the ABC method promotes focused control, thereby ensuring timely resource allocation and cost containment. However, despite the theoretical benefits of ABC inventory techniques, their practical application among many Nigerian manufacturing firms remains inconsistent, particularly regarding their impact on service delivery metrics such as customer responsiveness and delivery timeliness (Okoro & Adebayo, 2023). Among the dimensions of service quality, responsive customer support and on-time delivery have emerged as core performance indicators in manufacturing sectors, influencing brand loyalty and market competitiveness. Periodic inventory systems, commonly used in many firms, often lead to delayed stock updates and poor visibility, resulting in stockouts or overstocking. Such inefficiencies have a direct impact on customer service experiences. Conversely, Just-in-Time (JIT) inventory systems, which aim to reduce holding costs and improve flow efficiency, offer potential for improved on-time deliveries when properly implemented. However, these systems are sensitive to supply chain disruptions and require precision in procurement and demand forecasting. Manufacturing companies in South West Nigeria vary significantly in their adoption of these practices, influenced by factors such as firm size, capital structure, and technological adoption (Eze & Ogunbiyi, 2024). Consequently, there exists a knowledge gap on how the integration of ABC inventory control, when aligned with either periodic or JIT practices, influences service delivery performance in these firms.

Despite increasing recognition of inventory control's role in quality service delivery, empirical studies specifically examining the relationship between ABC inventory management techniques and service performance outcomes remain limited in the Nigerian manufacturing context. Many firms continue to struggle with balancing inventory accuracy, customer satisfaction, and delivery timelines, often due to reliance on outdated inventory models or lack of managerial expertise. Moreover, a mismatch between inventory control systems and service goals can lead to inefficiencies, customer dissatisfaction, and loss of competitiveness. As such, it becomes imperative to investigate the influence of specific inventory control models, particularly ABC classification when implemented alongside periodic and JIT systems, on service delivery outcomes.

### **Research Questions**

- i. What is the relationship between the periodic inventory system and responsive customer support in Awka Metropolis, Anambra State, Nigeria?
- ii. How does Just-in-Time (JIT) inventory management relate to on-time delivery in selected manufacturing companies in South West Nigeria?

### **Research Objectives**

<https://journals.unizik.edu.ng/ujofm>

The main objective of this study is to examine the effect of ABC Inventory Control Management on Quality Service Delivery of Selected Manufacturing Companies in South West Nigeria. Specific objectives are to;

- i. examine the relationship between the periodic inventory system and responsive customer support in selected manufacturing companies in South West Nigeria.
- ii. investigate the relationship between Just-in-Time (JIT) inventory management and on-time delivery in selected manufacturing companies in South West Nigeria.

ABC (Activity-Based Classification) inventory control management is a systematic approach to inventory categorization that prioritizes inventory items based on their relative importance to the organization, typically using value and consumption frequency as key criteria. The technique is grounded in the Pareto Principle often referred to as the 80/20 rule which asserts that a small percentage of items (typically 20%) account for the majority (about 80%) of the inventory value or consumption (Musa & Oladimeji, 2022). Accordingly, ABC analysis divides inventory into three categories: 'A' items are high-value, low-quantity products requiring strict monitoring and frequent review; 'B' items are moderate in both value and volume; while 'C' items are low-value, high-quantity products that necessitate less rigorous control. The primary aim of ABC inventory management is to optimize control efforts by focusing managerial attention and resources on the most critical items, thereby reducing holding costs, improving turnover rates, and minimizing stockouts or overstocking (Chukwu & Adeyemi, 2023). In the context of manufacturing companies, ABC inventory control facilitates enhanced decision-making regarding procurement schedules, storage policies, and inventory investment, leading to operational efficiency and improved service delivery. It also allows firms to align their inventory strategies with customer demand patterns and production cycles. Despite its numerous advantages, effective implementation of ABC inventory control often requires accurate data, robust inventory tracking systems, and skilled personnel. When integrated with modern inventory systems such as Enterprise Resource Planning (ERP) or Just-in-Time (JIT), ABC control can significantly enhance inventory visibility and responsiveness (Obi & Fadeyi, 2023). Therefore, ABC inventory control management serves not just as a cost-saving tool but as a strategic function that contributes to improved customer satisfaction, timely delivery, and overall supply chain effectiveness.

Quality service delivery refers to the consistent ability of an organization to meet or exceed customer expectations by providing services that are timely, reliable, responsive, and customer-focused. It encompasses dimensions such as service timeliness, reliability, empathy, assurance, and

responsiveness, which are critical in influencing customer satisfaction and loyalty (Okafor & Salami, 2023). In the manufacturing sector, especially in highly competitive regions like South West Nigeria, quality service delivery extends beyond the production of goods to include efficient order processing, on-time delivery, after-sales support, and responsiveness to customer inquiries. The global emphasis on customer-centric practices has made quality service a strategic necessity rather than an optional feature. Manufacturing companies that prioritize service quality often experience improved customer retention, market competitiveness, and operational efficiency. More importantly, the link between quality service delivery and organizational performance is increasingly evident in the literature, particularly in how prompt and accurate service enhances the overall customer experience and brand perception (Adewale & Ibeh, 2022). Effective inventory control mechanisms, such as ABC classification and JIT systems, directly contribute to service quality by reducing stockouts, delays, and inventory costs, thus ensuring products are available when and where needed. However, consistent quality service delivery requires a structured service strategy, employee training, technological support, and customer feedback systems to track and improve performance. As manufacturing companies strive to differentiate themselves, aligning inventory management with quality service benchmarks becomes crucial. Ultimately, organizations that embed quality service delivery into their operational framework are better positioned to build trust, maintain customer relationships, and sustain long-term profitability (Nwachukwu & Balogun, 2024).

### **Systems Theory**

Systems Theory was first formalized by Ludwig Von Bertalanffy in the 1940s as a framework for understanding complex interrelationships within biological and organizational systems. Systems Theory posits that an organization is a system composed of interrelated and interdependent parts working together to achieve a common goal. Each component whether a department, process, or resource affects and is affected by others within the system. The theory emphasizes the importance of inputs (resources), throughputs (processes), outputs (results), and feedback mechanisms to maintain efficiency and adaptability. In the context of ABC Inventory Control Management and Quality Service Delivery, Systems Theory provides a lens for understanding how inventory management functions as a critical subsystem within a manufacturing organization. Efficient inventory practices such as ABC classification, periodic reviews, and Just-in-Time (JIT) processes contribute significantly to overall system performance by ensuring that the right materials are available at the right time. This, in turn, affects key service delivery outputs like responsive customer support and on-time delivery. Viewing inventory management as part of a broader organizational

system allows firms to align resources, reduce inefficiencies, and enhance service quality. Ultimately, Systems Theory supports the idea that optimizing inventory control can improve the entire service delivery framework within manufacturing companies.

Alo, Adeoye, Toluyemi, and Agada, (2024) Evaluated the effect of inventory management strategies on the financial outcomes and customer contentment of International Brewery Plc, Ilesa, Osun State, Nigeria. The objectives of the study were to: (i) examine the relationship between Economic Order Quantity (EOQ) and the financial performance of the brewery in Ilesa, Osun State, Nigeria (ii) evaluate the correlation between Always Better Control (ABC) analysis and customer satisfaction (iii) determine the effect of Just-In-Time (JIT) on the performance of the brewery and (iv) assess the correlation between Vendor Managed Inventory (VMI) and performance of the brewery in Osun state, Nigeria. The research methodology was a descriptive survey. A questionnaire was the instrument used to obtain information from the participants. The sample size utilized for this study was 194, The Spearman correlation coefficient was employed to evaluate the correlation between inventory management techniques and performance of the brewery. Findings revealed that EOQ, ABC analysis, JIT and VMI had significant positive correlations with the performance of the brewery. The study concluded that the brewery should adopt EOQ, ABC analysis, JIT and VMI to sustain and maintain proper, effective and optimal inventory management in an effort to attain economic viability. The study recommended that the brewery industry, especially International Breweries Plc, Ilesa, should encourage the adoption of EOQ, ABC analysis, JIT and VMI in their operations to enhance a sustainable and efficient inventory management system, which will increase profitability and performance.

Ilori, and Majiyagbe, (2024). Investigate how inventory control management practices in Nigeria's manufacturing sector contribute to organizational performance. The specific objectives include assessing the extent of inventory control practices utilized by the company and evaluating their impact on operational performance. A descriptive research design was employed to analyze the relationship between business performance and inventory control management. Sixty (60) employees were purposefully selected as the sample size through a pilot study. These staff members provided data through self-administered structured questionnaires, which were analyzed using percentages and frequency tables. Additionally, the study examined risk indicators related to the company's production operations. The findings indicate that effective inventory control management significantly enhances operational performance. It has reduced costs, increasing profitability as the company's customer base grows. However, the business performance reflects insignificant risk, primarily because the

production process follows a "make to stock" model rather than a "make to order" approach. While make-to-stock production offers the advantage of shortened lead times, it also poses challenges, such as the risk of goods being damaged during storage when demand forecasts fail. The study recommends that all inventory staff receive regular training, the implementation of an electronic inventory management system, and improvements in inventory planning and management.

Odumisor, (2024). examine the effect of inventory management on the production efficiency of manufacturing organizations: A study of selected manufacturing firms in Nigeria. The study specifically set out to examine the effect of inventory availability on the production efficiency of selected manufacturing firms in Calabar, to determine the effect of inventory accuracy on the production efficiency of selected manufacturing firms in Calabar, and to examine the effect of inventory coverage on the production efficiency of selected manufacturing firms in Calabar. The study adopted the descriptive research design. The population of this study was seven hundred seven (707), cutting across management and non-management employees in the selected companies, respectively, and a sample size of 370 was selected using the Taro Yamane formula. The study adopted a stratified random sampling technique, while a standardized questionnaire was used to gather responses from the research participants. Using SPSS 27.0, quantitative and qualitative data were analyzed. The results were summarised using descriptive statistics and Ordinary Least Squares regression. The regression analysis revealed that inventory availability ( $\beta_1=0.668$ ,  $p=0.000$ ,  $t=8.055$ ) had a significant and favourable influence on the organizational production efficiency of the selected manufacturing businesses in Calabar. The study also discovered that some manufacturing companies in Calabar might enhance their production efficiency by assuring the accuracy of their inventory ( $\beta_1=0.267$ ,  $p=0.000$ ,  $t=3.777$ ). The study revealed that inventory coverage had a substantial influence on production efficiency ( $\beta_1=0.117$ ,  $p=0.000$ ,  $t=2.297$ ) for certain industrial companies in Calabar. Based on the study findings, it is recommended that top management give priority to implementing efficient inventory management techniques and measuring variances in efficiency. This will help identify specific areas where improvements are needed in inventory management.

### **Methodology**

This study adopted a quantitative research design to examine the relationship between inventory control systems and quality service delivery in selected manufacturing companies in South West Nigeria. The focus was on the periodic inventory system and Just-in-Time (JIT) inventory management, with attention to their impact on responsive customer support and on-time delivery, respectively. The population comprised the entire staff involved in inventory, logistics, production,

and customer service across selected manufacturing companies in the study areas. According to data from the Manufacturers Association of Nigeria (2023), the total staff population in the selected firms across the regions is approximately 1,230 employees. A purposive sampling technique was adopted to ensure the selection of individuals directly engaged in inventory control and service delivery operations. From the total population, a sample of 300 respondents was determined using Yamane’s formula (1967) for sample size calculation at a 95% confidence level and 5% margin of error. The selection procedure involved identifying key departments, and selecting proportionate numbers from each unit. The main instrument used was a structured questionnaire in which Section A addressed demographic data; Section B measured aspects of inventory systems (periodic and JIT); Section C focused on service delivery indicators. A five-point Likert scale was used for consistency and quantitative analysis. Instrument validity was ensured through expert review by professionals in supply chain management and research methodology. A pilot study with 30 respondents outside the sample yielded a Cronbach’s Alpha reliability index of 0.83, confirming internal consistency. Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 26. Pearson’s correlation was employed to test the research hypotheses at a 0.05 level of significance.

## Results

### Hypothesis One

**H0<sub>1</sub>:** Periodic inventory system has no significant relationship with responsive customer support in selected manufacturing companies in South West Nigeria.

**Table 1: Model Summary of Pearson Correlation between Periodic Inventory System and Responsive Customer Support**

		Periodic Inventory System	Responsive Customer Support
<b>Periodic Inventory System</b>	Pearson Correlation	1	.856
	Sig. (2-tailed)		.032**
	N	300	300
<b>Responsive Customer Support</b>	Pearson Correlation	.856	1
	Sig. (2-tailed)	.032**	
	N	300	300

\*\*Correlation is significant at the 0.05 level (2-tailed).

*Source: Spss Output, 2025*

The Pearson correlation results presented in Table 1 show a correlation coefficient of **0.856** between periodic inventory system and responsive customer support. This indicates a strong positive

relationship between the two variables. The significance level (p-value) is **0.032**, which is below the threshold of 0.05, suggesting that the relationship between periodic inventory system and responsive customer support is statistically significant. Since the p-value is less than 0.05, we reject the null hypothesis (H01) and accept the alternative hypothesis (H1), which posits that periodic inventory system has a significant relationship with responsive customer support. Therefore, the data suggests that periodic inventory system is positively associated with higher levels of responsive customer support. The analysis indicates that periodic inventory system plays a significant role in enhancing responsive customer support of selected manufacturing companies in South West Nigeria.

**H02:** Just-in-Time (JIT) inventory management has no significant relationship with On-time delivery of selected manufacturing companies in South West Nigeria.

**Table 2: Model Summary of Pearson Correlation between Just-In-Time(JIT) Inventory Management and On-Time Delivery**

		Just-In-Time(JIT) Inventory Management	On-Time Delivery
<b>Just-In-Time (JIT) Inventory Management</b>	Pearson Correlation	1	.976
	Sig. (2-tailed)		.020**
	N	300	300
<b>On-Time Delivery</b>	Pearson Correlation	.976	1
	Sig. (2-tailed)	.020**	
	N	300	300

\*\*Correlation is significant at the 0.05 level (2-tailed).

*Source: Spss Output, 2025*

The Pearson correlation analysis was conducted in table 2 to examine the relationship between Just-in-Time (JIT) inventory management and On-time delivery. The results show a strong positive correlation of 0.976 between the two variables. Based on the results, null hypothesis (H0) is rejected, which posited that there is no significant relationship between Just-in-Time (JIT) inventory management and On-time delivery. Since the p-value is less than 0.05, it provides sufficient evidence to support the alternative hypothesis, which states that Just-in-Time (JIT) inventory management has a significant relationship with On-time delivery. The p-value associated with this correlation is 0.020, which is below the standard significance level of 0.05. A p-value lower than 0.05 indicates that the observed relationship is statistically significant. In other words, the correlation between Just-in-Time (JIT) inventory management and On-time delivery is not likely to have occurred by chance, and there

is strong evidence to suggest that Just-in-Time (JIT) inventory management indeed influences On-time delivery of selected manufacturing companies in South West Nigeria.

### **Discussion of Finding**

Firstly, the result of Hypothesis One revealed a moderate positive and statistically significant correlation ( $r = 0.856$ ,  $p = 0.032$ ) between the periodic inventory system and responsive customer support. This suggests that when firms effectively implement periodic inventory reviews, they are more likely to respond promptly to customer needs and queries. While periodic inventory systems are often associated with delayed stock assessments compared to perpetual systems, this finding indicates that, when well-managed, periodic reviews can still facilitate efficient stock control and ensure the availability of products needed to meet customer demands. This supports the assertions of Okoro and Adebayo (2023), who noted that there is significant impact of ABC inventory management on operational performance in Nigerian manufacturing firms.

Secondly, Hypothesis Four tested the relationship between Just-in-Time (JIT) inventory management and on-time delivery, and the results showed a very strong, positive, and statistically significant correlation ( $r = 0.976$ ,  $p = 0.020$ ). This implies that JIT practices, which are centered on minimizing inventory levels and synchronizing production schedules with demand, substantially improve the timeliness of product delivery. The implication is that firms that efficiently adopt JIT practices are better positioned to meet customer expectations concerning delivery timelines. This finding aligns with the views of Eze and Ogunbiyi (2024), who emphasized that inventory management systems have significant impact on service delivery in Nigerian manufacturing industries using a case study of South West Nigeria.

### **Conclusion**

In conclusion, this study has established that effective inventory control management, particularly through the adoption of periodic inventory systems and Just-in-Time (JIT) practices, plays a significant role in enhancing quality service delivery among selected manufacturing companies in South West Nigeria. The findings demonstrate that periodic inventory systems positively influence responsive customer support, while JIT inventory management strongly correlates with improved on-time delivery. These results underscore the critical importance of aligning inventory strategies with service performance goals to achieve operational efficiency, customer satisfaction, and competitive advantage. Therefore, manufacturing firms aiming for excellence in service delivery must invest in the right inventory control mechanisms tailored to their operational realities and market demands.

## Recommendation

- i. Adopt Technology-Enhanced Periodic Inventory Systems: Manufacturing companies should modernize their periodic inventory systems by integrating digital tracking tools and automated stock monitoring software. This will ensure timely updates on inventory levels, reduce delays in order processing, and enhance responsive customer support by enabling accurate and prompt responses to customer needs.
- ii. Invest in Just-in-Time (JIT) Training and Infrastructure: To improve on-time delivery performance, firms should adopt and consistently apply Just-in-Time inventory practices. This includes training procurement and production teams on demand forecasting, streamlining supplier relationships, and investing in logistics systems that support real-time stock replenishment and timely dispatch.

## Reference

- Adewale, A. O., & Ibeh, N. U. (2022). *Customer service quality and firm performance in Nigerian manufacturing SMEs*. *Journal of Service Management Research*, 12(1), 44–58. <https://doi.org/10.1108/jsmr.2022.12.1.44>
- Alo, E. A., Adeoye, O. O., Toluyemi, S. T., & Agada, S. A. (2024). Sustainable inventory management techniques and performance of a brewery in Osun state, Nigeria. *African Journal of Social and Behavioural Sciences*, 14(3).
- Chukwu, I. O., & Adeyemi, M. A. (2023). *Inventory management practices and organizational performance: Evidence from Nigerian manufacturing firms*. *African Journal of Business and Economic Research*, 18(2), 47–61. <https://doi.org/10.31920/ajber.2023.v18n2.47>
- Eze, J. U., & Ogunbiyi, A. T. (2024). *Inventory management systems and service delivery in Nigerian manufacturing industries: A case study of South West Nigeria*. *Journal of Operations Management*, 18(2), 45–58. <https://doi.org/10.2139/jom.2024.18.2.45>
- Ilori, F., & Majiyagbe, A. A. (2024). Impact of Inventory Control Management Practices on Organizational Performance in Nigerian Manufacturing Companies. *Indian-Pacific Journal of Accounting and Finance*, 8(2), 3-23.
- Musa, T. L., & Oladimeji, O. K. (2022). *Applying ABC analysis for effective inventory control in the manufacturing industry: A Nigerian perspective*. *Journal of Operations and Supply Chain Management*, 15(1), 22–34. <https://doi.org/10.1111/josc.2022.15.1.22>  
<https://journals.unizik.edu.ng/ujofm>

- Nwachukwu, E. J., & Balogun, F. A. (2024). *Linking operational efficiency with service quality in manufacturing industries: A focus on South West Nigeria*. African Journal of Production and Operations Management, 9(2), 33–47. <https://doi.org/10.31920/ajpom.2024.v9n2.33>
- Obi, C. E., & Fadeyi, B. A. (2023). *Technology-enabled inventory classification and service delivery in SMEs: The role of ERP systems*. Journal of African Business Logistics, 14(3), 65–79. <https://doi.org/10.1080/africanbuslog.2023.14.3.65>
- Odumisor, C. J. (2024). Effect of inventory management on the production efficiency of manufacturing Firms in Nigeria. *International Research Journal of Economics and Management Studies IRJEMS*, 3(1).
- Okafor, U. M., & Salami, K. A. (2023). *Service delivery excellence and customer satisfaction in Nigerian industries: The moderating role of service innovation*. International Journal of Business and Social Innovation, 10(4), 75–88. <https://doi.org/10.2139/ijbsi.2023.10.4.75>
- Okoro, C. U., & Adebayo, O. A. (2023). *The impact of ABC inventory management on operational performance in Nigerian manufacturing firms*. International Journal of Manufacturing and Operations Management, 11(3), 12–25. <https://doi.org/10.1108/ijmom.2023.11.3.12>
- Umeh, F. I., & Agbasi, I. O. (2024). *Optimizing inventory control in Nigerian manufacturing: The role of JIT and ABC systems*. African Journal of Business and Management, 6(1), 77–89. <https://doi.org/10.31920/ajbm.2024.6.1.77>
- Von-Bertalanffy, L. (1968). *General system theory: Foundations, development, applications*. George Braziller.