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Inventory Control and Customer Satisfaction in Selected Manufacturing Firms in Nigeria: Just-In-Time Approach

*Augusta AMAIHIAN[1], Maxwell OLOKUNDUN[2], Mercy OGBARI[3], Olufemi Amos AKINBOLA[4] & Busola E. KEHINDE[5]
[1,2,3,4,5]Department of Business Management, Covenant University, Ota, Ogun State, Nigeria.

*Corresponding Author: **augusta.amaihian@covenantuniversity.edu.ng**

ABSTRACT

The purpose of the study was to investigate the effect of inventory control (just-in-time approach) on customer satisfaction. Questionnaires was used to collect the data from a convenience sample of (210) employees of the selected manufacturing firms, which was determined using a survey method. The hypothesis that was formulated and tested using Regression coefficient. This result shows that there were both significant relationship and that just in time approach had a significant effect on customer satisfaction. Hence, the study recommends that; Organizations should ensure that stocks are sufficient to meet the requirements of production and customer requirements at all times, while avoiding holding unnecessary surplus stocks that may increase the cost of holding, resource wastage and ineffectiveness.

Keywords: Inventory control, just-in-time approach, customer satisfaction

1. Introduction

Many businesses understand the need of delivering high-quality services to their clients in order to satisfy their needs. They also understand that having good relationships with customers' boosts revenue, lowers expenses, and expands market dominance. (Otchere, Adzimah, & Aikens, 2016). As more clients are now starting to ask for higher-quality products with quicker and more accurate deliveries at lower prices (Ingaldi, & Ulewicz, 2019; Srinivasan, 2012). Hence, to meet consumer needs quickly, manufacturing companies must be able to outperform their rivals utilizing a variety of techniques, including product quality, pricing, and cost (Othman, *et al.,* 2020; Olhager, 2013).

As a result, managing inventories to satisfy growing customer demand has become a significant difficulty for manufacturing companies. The arrangement and control of inventories and other associated tasks are essential to the success of producing quality goods. The ultimate aim of controlling inventory, is to provide goods and services to customers at the time they need it and reduce company waste without necessarily reducing profit in the organization (Singh, & Verma, 2018). The problem of unmanaged inventory can be part of the root causes of business failure. Ndunge (2012) discovered the control of inventory applications facilitate firms to reduce inventory waste and minimize cost. The execution of inventory control brought about higher profit record to organization which made respond quickly to customers and suppliers needs (Abd Karim, Nawawi, & Salin, 2018). The primary problem facing Nigerian manufacturers currently is the requirement to increase efficiency while also ensuring customer satisfaction (Adeyeye *et al.,* 2016). Yet, manufacturing companies have been criticized with using inadequate inventory control methods, which has seriously hampered their capacity to meet customers' needs. (McMaster et al., 2020; Smith, 2019). Just in time inventory control serves as a useful tool to ensure that goods are delivered to customers at the time, they need it ensuring customers are best served

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with a reduced cost and improved quality (Siddiqui, 2022). Therefore, the study set out to investigate the impact of just-in-time inventory control on customer satisfaction among Nigerian manufacturing companies.

2. Literature Review

At the Toyota Motor factory in the middle of the 1970s, Shigeo Shing and Taichi Ohno developed the just-in-time (JIT) inventory control method (Mwangi, 2016; Mpwanya,2007). JIT inventory control approach is a technique for enhancing production quality, adaptability, and productivity by getting rid of wastage and involving everyone in the process (Van Wyk, & Naidoo, 2016). JIT inventory control's main goal is higher quality in order to meet and exceed customer expectations rather than merely minimizing inventories. JIT inventory control has a number of potential advantages for firms who embrace it, according to Adeyeye et al. (2016). Nevertheless, the authors noted that the objective must involve the removal of wastage, enhanced merchandise, and optimal service delivery in order to reap these advantages.

Satisfaction is a function of a user's assessment of an item based on a comparison of the evaluation of the item to pre-purchase preconceptions (Ndengane, Manson & Mutize 2021). Customer satisfaction encourages brand loyalty and subsequent product acquisitions (Eckert, Neunsinger, & Osterrieder, 2022; Park, & Thangam, 2019; Curtis et al., 2011). Manufacturing companies may define customer satisfaction as both achieving customer specifications and deadlines and on-time delivery (Eckert, Neunsinger, & Osterrieder, 2022). In a world of increased competition, businesses must adapt to the changing needs of their customers (Thogori & Gathenya, 2014). According to Fida, Ahmed, Al-Balushi, and Singh (2020), one of a company's benchmarks on the road to sustainability is customer satisfaction. Today's businesses place a high priority on customer satisfaction, which affects how competitive they are (Dam, & Dam, 2021). According to (Rukiya, & Yusuf, 2019), the supply chain partners' adaptability is crucial for meeting customer expectations.

2.1 Just in time inventory control approach

Previous empirical study has discovered that just in time inventory control has an impact on overall operational performance (Alhamdi et al., 2019; Mtar, & Smondel, 2019; Smith, 2019; Siddiqui, 2019 Van Wyk, & Naidoo, 2016; Vardhana, & Venugopal, 2019). According to Hay (1988), JIT enables manufacturing firms to improve the quality of the products they manufacture endlessly and cut the time it takes for them to react to their targeted audience by up to 90%. According to Basha and Navya (2020), the Just-In-Time inventory control technique ensures quick service availability when buyers require anything, hence facilitating timely service delivery and resulting in customer satisfaction. Almadany, Rusyfa, and Khair (2020) claim that JIT can do away with the costs associated with purchasing, transportation, and inventory holding. Saving money for manufacturing organizations is one of the most significant benefits of JIT inventory control. Organizations that adopt just-in-time systems perform significantly better than those that do not, claim Sharma and Gangrade (2015). This distinction is the result of their endeavors to shorten the process, collaborate with suppliers, and teach staff to uphold continual quality improvements.

2.2 Theoretical Review

Lean theory is a development of the just-in-time principles. Just in time is described by Aktas, Croci, and Petmezas (2015) as a pull-based system created to synchronize the business and production operations across the supply network. The timing and scale of the

deployment, taken collectively, are what give the lean theory its empirical significance (Hofer, Eroglu, & Hofer, 2012). But according to the argument, having too much inventory makes it difficult for businesses to adjust to changes in demand. Since the majority of the enterprises under study do not apply even the most fundamental inventory management concepts and practices, poor inventory control is a significant issue for enterprises in emerging economies. Because of this, the Lean theory is crucial to the success of just-in-time inventory control, which will lead to improved competitiveness, adaptability, agility, economic viability, and resource control.

2.3 Empirical Review

Sharma and Gangrade (2015) looked at how JIT was used in the service processing and distribution network to achieve the goal of customer satisfaction. They found that there was a substantial correlation between greater customer satisfaction rates and appropriate JIT inventory control adoption. Lunkunse (2016) looked into the connection between inventory control and client satisfaction. According to the data analysis, inventory control and customer satisfaction did not have a significant link. The organization also suffered inventory constraints. The research came to the conclusion that manufacturing companies' inadequate inventory control procedures have a significant negative influence on their capacity to fulfill customers' needs. In their 2018 study, Atnafu and Balda sought to experimentally investigate how inventory management practices affect enterprises' ability to compete and their ability to execute as an enterprise. 188 MSEs in the manufacturing sub-sector provided data for the study, and structural equation modeling was used to test the links and hypotheses stated in the conceptual model. According to the findings, better corporate efficiency and a stronger competitiveness can arise from increased rates of inventory management technique. Poi and Ogonu's (2019) investigation into the link between petroleum marketing firms' inventory management and customer satisfaction. to provide answers to the many problems that businesses and customers in the industry are having with managing inventory and satisfaction of customers. 11 enterprises listed with the NSE were the population sample for the study, which used a cross-sectional survey design. The Pearson product moment correlation statistical tool was used to assess the study hypotheses and determine the strength of the link. The study discovered a favorable and substantial relationship between managing inventory and customer satisfaction. The analysis' findings led the author of the research to the conclusion that management of inventory and customer satisfaction are positively and significantly related.

Rukiya and Yusuf (2019) investigated how inventory control affects customer satisfaction in Kenyan businesses. The investigative design used in the study was a questionnaire. 232 people were included in the survey. Quantitative analysis was used to analyze the data, utilizing both descriptive and inferential statistics. According to the study's findings, inventory management significantly affects customer satisfaction. In Nigeria, Tarurhor and Osazevbaru (2021) look at how inventory control affects customer satisfaction using lead time as a moderating factor. They handed out 265 questionnaires. Multiple regression and structural equation modeling are used in the study to evaluate quantitative data. Additionally, several marketing analytical techniques were employed to investigate the effect of inventory management on customer satisfaction. As a moderating factor between competitive supplier partnerships, lean inventory, and information systems, which are indicators for inventory management and customer satisfaction, the acquired results lend credence to the model's suitability. The result shows a substantial and positive relationship between the dependent and independent variables. Hence, in the light of the preceding empirical review, this study hypothesizes that:

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H_1: Just in time inventory control approach affects customer satisfaction

3.   Methodology

The target population for this study comprise all employees in May & Baker Nig, PLC with the total number of 510 workers and 57 workers in Hebron which was gotten from the human resource department of both companies. The study employed the Yard's formula to determine the sample size, and a sample of 210 respondents was obtained. This research employs a quantitative research design, which encompasses the considerable development of statistical information from a sufficient number of administered questionnaires. As a result, the research variables can be thoroughly studied using well-structured questionnaires, ensuring that the data gathered from the study is not manipulated. Purposive sampling was utilized to make the choices of manufacturing firms. Also, the study employed a simple random technique to ensure unpredictability and representativeness by offering each participant an equal possibility of being chosen. Content validity was used in this study to ensure that the questionnaire items covered the content that was intended to be measured, which are inventory control (just-in-time approach) and customer satisfaction. Also, the construct validity method was used in this study to see how well the research variables measured what it claimed to evaluate. Descriptive statistics and regression analysis were used to evaluate the data obtained. These were utilized to determine the strength of the relationship between the independent and dependent variables. The study employs Cronbach's Alpha to test the reliability of the research instrument. The reliability statistics is presented in table 1. With a score of .780, the results show that the questionnaire which is the research instrument for this study is consistent and reliable.

Table 1: Reliability Statistics

Cronbach's Alpha	N of Items
.780	24

Authors' computation, 2021

4.   Data Analysis and Discussion of findings

4.1   Demographic Information of Respondents

From the analysis for this study, 166 questionnaires were administered to May & Baker Nig Plc Ogun state Ota and 57 questionnaires were also administered to Hebron Drinks. The distribution of respondents by gender is seen in frequency table 2, Male respondents made up the majority of the sample (55.2%) with frequency (116), while female respondents made up the remaining 94 (44.8%) of the sample. The implication of this is that there are more male respondents captured for this study. The table also shows the age distribution. respondents were between the ages of 20-30 with frequency (80), valid % (38.1%) and cumulative % (52.9). However, few of the respondents were between the ages of 51 years-above, with frequency (10), valid % (4.8). The table also shows the educational qualification of the respondents. B.sc holders with frequency (80), valid % (38.1%). Nevertheless, few numbers of respondents are Ph.D. holders with the frequency (15), valid % (7.1). Furthermore, the table captures the position of respondents. The findings implies that a large number of respondents fell within the range of middle manager with frequency (92), valid % (43.8). However, few numbers of respondents are the top management with frequency (57), valid % (27.1). from the table, it is revealed that 54 (25.7%) of the respondents are in

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distribution department while the department with the least number of respondents are inventory management and control department with frequency (35), valid % (16.7) respectively.

Table 2: Demographic Information of Respondents

VARIABLE	FREQUENCY	PERCENTAGE
GENDER		
Male	116	55.2
Female	94	44.8
AGE		
>20	31	14.8
20-30	80	38.1
31-40	63	30.0
41-50	26	12.4
51-above	10	4.8
EDUCATIONAL LEVEL		
SSCE	33	15.7
OND	34	16.2
B.sc	80	38.1
M.sc	48	22.9
Ph.D	15	7.1
FORMAL POSITION/STATUS		
Top management	57	27.1
Middle level manager	92	43.8
Lower level manager	61	29.0
DEPARTMENT		
Production	40	19.0
Procurement	43	20.5
Distribution	54	25.7
Inventory Management and control	35	16.7
Finance	38	18.1

Authors' computation, 2022

4.2 Descriptive Statistics

Table 3 shows the activities of the institution that indicate that the institution adopts Just in Time. Statistics from the table shows that raw materials are only ordered on request or at the time of delivery (mean=3.99). The table shows that it takes long time for your warehouse to receive an order (mean =4. 8). The table also showed that reduction in fluctuation which increases firm competitive edge (mean=4.31). The table also shows that efficiency is increased within the production process (mean=4.25). This in general shows that the institution adopts Just in Time to complete all activities needed in production.

Table 4 shows the descriptive statistics of the activities of the institution that customers enjoy ultimate satisfaction of the firm's product. Results from the customers return to purchase firm's product or services repeatedly (mean=4.30). The results from the table also shows the customer often expresses their desire for higher quality on the product/service of this company (mean=4.19). The result from the table show that expectations of customers are adequately met by the service or product offered (mean=4.19). The results from the table it shows that our firm has recorded increased customer complaints (mean=3.81). This generally implies that firm put into consideration the ultimate satisfaction of its consumers.

The table 5 shows the regression analysis of the hypothesis tested for this study. The regression result indicated that JIT explained 4.1% of the variance (R^2 = .0.41, $F(8,953)$=

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2.992 P<.01). it was found that based on this overall significant level of the model, it can be concluded that the null hypothesis should be rejected and the alternate hypothesis accepted. This implies that JIT inventory control philosophy have a significant effect on customer satisfaction of the selected manufacturing firm.

Table 3: Descriptive Statistics of Responses on Just in Time

	N	Minimum	Maximum	Mean	Std. Deviation
Raw materials are only ordered on request or at the time of delivery	210	1	5	3.99	1.137
It takes long time for your warehouse to receive an order	210	1	5	4.08	1.104
Reduction in fluctuation which increases firm competitive edge	210	1	5	4.31	.828
Efficiency is increased within the production process	210	1	5	4.25	.977

Authors' computation, 2022.

Table 4: Descriptive Statistics of Responses on Customer Satisfaction

	N	Minimum	Maximum	Mean	Std. Deviation
Customers return to purchase firm's product or services repeatedly	210	1	5	4.30	.994
Customer often express their desire for higher quality on the product/service of this company	210	1	5	4.19	1.084
Customer expectations are adequately met by the service or product offered	210	1	5	4.19	1.111
Our firm has recorded increased customer complaints	210	1	5	3.81	1.363

Authors' computation, 2022.

4.3   Inventory Control and Customer Satisfaction

The hypothesis investigates the impact of JIT inventory control on customer satisfaction. To test the hypothesis, the dependent variable JIT was regressed on a predictor of customer satisfaction. JIT significantly predicted customer satisfaction based on the results, F (3.483/0.389) = 8.953, < 0.01, demonstrating its critical role in affecting customer satisfaction (b=.214, p.01). As a result, the findings showed that JIT had a favorable but minimal impact on customer satisfaction. Additionally, the R2.041 demonstrates that the model accounts for 4.1% of the variance in customer satisfaction. The tables below further explain the results.

The study looked into how JIT affected customer satisfaction. According to the report, JIT boosts customer satisfaction in manufacturing companies by 4.1 percent. This is supported

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by table 5 below, where R=0.203, which denotes a weakly positive correlation, and R2 =0.041.

In trying to test the significant of the model, the study used ANOVA to test for linearity between JIT and customer satisfaction. Table 6 provides an evaluation of the result's statistical significance. The F critical at 5% level of significance was 8.298. Since F calculated is greater than the F critical (value = 8.953), this shows that the overall model was significant. A statistically significant correlation between just in time and customer satisfaction is also shown in the table (p 0.01). The implication of this finding is that when established in a company at the appropriate moment, JIT inventory control leads to increased customer satisfaction.

The table 7 shows the model that expresses the extent to which just in time affects customer satisfaction. The β was statistically significant (β = 0.214, t=2.992, p < 0.01), which adds up to explaining the dependent variable just as the R value in the model summary in table 5. The hypothesis that JIT inventory control approach influence customer satisfaction was therefore confirmed because there was a statistically significant influence of JIT inventory control on customer satisfaction in manufacturing firms.

Table 5: Model Summary for JIT

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.203[a]	.041	.037	.62373

Authors' computation, 2022

Table 6: ANOVA for JIT

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3.483	1	3.483	8.953	.003[b]
	Residual	80.921	208	.389		
	Total	84.404	209			
a. Dependent Variable: CS						
b. Predictors: (Constant), JIT						

Authors' computation, 2022

Table 7: Coefficients for JIR

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	3.232	.301		10.753	.000	2.639	3.824
	JIT	.214	.072	.203	2.992	.003	.073	.355

Authors' computation, 2022

5. Conclusion and Recommendations

This research has added to the body of knowledge regarding the effect of the just-in-time inventory control approach on customer satisfaction in manufacturing companies in southwest Nigeria. The discovery that the majority of industrial companies in Nigeria are not implementing JIT inventory system is rather alarming given the immense positive advantages of doing so. As a result of this study, companies have recognized areas in which costs should be minimized as well as ensuring total efficiencies are sustained in the companies. The study also developed a method for improving inventory management policies. This study concludes by advancing academic and scientific knowledge in manufacturing firms on inventory management practices and customer satisfaction. Businesses, especially those in the manufacturing industry, stand to gain significantly from decreased storage costs, a low rate of product deterioration damage, and cheaper inventory maintaining expenses.

Additionally, the study's findings revealed a statistically considerable positive relationship between the use of the JIT inventory control philosophy and increased customer satisfaction. Owing to the difficulty of functioning in the twenty - first century marketplace, which is blasted by constantly evolving customer wants and escalating level of competitiveness from both current and emerging inventive enterprises, such an implication can be of considerable help to the manufacturing industry. The manufacturing sector must be flexible, innovative, and creative in order to demonstrate the best customer experience at competitively reduced costs.

Applying the JIT inventory control concepts can help businesses adapt to the tough circumstances of the contemporary business environment. Building robust supply relationships between manufacturing companies and their subcontractors is necessary as a result of the difficulties using the JIT principles. Consequently, it is advised that the manufacturing sector be educated on JIT inventory control's fundamentals and the appropriate techniques to put them into practice. Organizations must also provide training in JIT inventory control to their employees. Employees would be more aware of the necessity of JIT inventory control and would be more engaged as a result of this.

Also, this study suffered some limitations, this research study was limited as a result of the bias of the employees in filling the questionnaires due to the fear of responding to any statement that will tarnish the company image. Also, getting approval from the human resource department to distribute my questionnaire was Labour intensive.

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