ANALYSIS OF INVENTORY MANAGEMENT ADOPTION ON FOOD AND PROCESSING FIRMS' PERFORMANCE IN AKURE METROPOLIS, ONDO STATE, NIGERIA

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Abstract

The study analysed inventory management adoption on food and processing firms' performance in Akure metropolis, Ondo State, Nigeria. The study was carried among selected food processing firms i.e. (Bakeries and Cocoa Processing firms) under manufacturing industry of the economy in Akure South Local Government Area. Ninety Six (96) copies of questionnaire were distributed out of which seventy eight (78) copies which represent (81.3%) were retrieved. The method of data analysis adopted were both descriptive and inferential statistics (Mean, Mean ranking index and Pearson correlation). The findings revealed that most of the firms has a functional inventory management practices but majority of them doesn't use JIT in their day to day inventory activities with mean values of (2.92) and also most of the respondents disagree that the use of technology for inventory monitoring and control with mean values of (2.21). The hypothesis was tested with the use of Pearson Product Moment Correlation and the outcome presented in the table shows that Pearson Product Moment Correlation Coefficient, r is 0.571 and a significant level, p of 0.015, which confirm that the null hypothesis was rejected while the alternate hypothesis was accepted. The study concludes that inventory management practices can improve the delivery schedule for materials, reduce materials wastage, quality and quantity specifications performance. The study recommends that inventory management practices should be adopted by manufacturing firms especially those in food and processing sector so as to increase revenue and production capacity of the organization.

Keywords: Inventory management, Technology, Materials, Food Processing, Firms, Performance.

1.   INTRODUCTION

Heizer and Render (2008), defines inventory management as a systematic control and regulation of purchase, storage, and usage of materials in order to maintain an even flow of production and at the same time avoiding excessive investment in inventories. Hsu and Kleiner, (2001), says that inventory management comprised of two major activities which are the control of inventories and the planning of inventories, because inventory control involves managing the inventory that is already in warehouse, the quantities, the cost and location. Also, inventory planning involves time to order for goods, what quantity to order, source to order, market survey, market conditions and mode of transportation.

The primary function of inventory management is to manage the flow of materials in the organization and the costs associated with handling materials are kept to a minimum. The inventory management deals with the availability of materials and transportation of materials to the site where they are needed. Alkinson (2005), stresses that supplies are a small part of inventory, and do not involve significant investment. Therefore, a sophisticated system of inventory control may not be maintained for the supplies and planning is not hectic but very crucial to efficiently manage inventory to offer the best to the customers.

However, despite medium scale enterprises representing about 87% of all firms operating in Nigeria (USAID, 2005), they only account for 10% of total manufacturing output, 25% of total employment in the productive sector and 37% of GDP. General challenges facing Nigerian small enterprises are management of inflow and outflow of resources, because it involved efficient inventory management practices which includes adequate managerial skills, reliable inventory management techniques and adoption of efficient enterprise resource planning (Aladejebi, 2019).

The study analysed inventory management adoption on the performance of food and processing firms under manufacturing industry of the economy in Akure metropolis, Ondo

State, Nigeria. Food and processing firms (Cocoa processing and Bakeries) of the manufacturing industry was selected due to the fact that they deal with raw materials day to day in their daily activities. Efforts were made to highlight the importance of inventory management adoption and its effects on the performance of the selected food and processing firms within the state capital.

1.2 Objectives of the Study

The general objective of the study analysed the inventory management adoption on selected food and processing firms' performance in Akure Metropolis of Ondo State, Nigeria. While the specific objectives are to:

i. identify types of inventory management adopted by the food and processing firms in Akure Metropolis, Ondo State, Nigeria; and

ii. analyse the effect of inventory management adoption on the performance of food and processing firms in Akure Metropolis, Ondo State

1.3 Hypothesis

H_0: There is no relationship between inventory management adoption on the performance of selected food and processing firms in Akure Metropolis.

2.0. LITERATURE REVIEW

2.1. Concept of Inventory Management Practices

Lazaridis and Dimitrios (2005) highlighted the importance of firms keeping their inventory at an optimum level by analysing the relationship between working capital management and corporate profitability and stressed that its mismanagement will lead to excessive tying up of capital at the expense of profitable operations. In the manufacturing industry inventory records and product component lists are merged to determine what items

must be ordered, when they should be ordered, and how much of each item should be ordered in each time period. When the inventory becomes too low, a new order is recommended (Cavinato, 1994). The role that a materials manager plays in an organization is strictly economical since the materials manager should keep the total cost of materials as low as possible. The person in charge of handling materials should keep in mind the goals of the company and insure that the company is not paying extra money for materials.

Hugos (2000) says that inventory management is a set of techniques that are used to manage the inventory levels within different companies in the supply chain. Inventory management and control are crucial to a firm because mismanagement of inventory threatens a firm's viability (Sprague and Wacker, 1996). Similarly, Van-Heck (2009) argues that inventory management is primarily about specifying the size and placement of stocked goods. Inventory management is the systematic control and regulation of purchase, storage, and usage of materials in order to maintain an even flow of production and at the same time avoiding excessive investment in inventories (Heizer and Render, 2008).

According to Susan and Michael (2000), accuracy of inventory records is necessary to provide satisfactory customer service, determine replenishment of individual items; ensure that material availability meets repair or project demand, analyse inventory levels and dispose of excess inventory. Susan and Michael (2003), Stock records provide the management with the information which is used to ensure accountability through stocktaking and stock audit exercise.

Kothari (1992) asserts that the aim of inventory management is to increase production efficiency. The objectives of inventory management and control are considered as the establishment and maintenance of the total investment in stock at the minimum consistent with; adequate customer service, operating efficiency and physical limitations taking into account the operating policies of the organization (Jessop, 1994).

There so many reasons why firms hold inventory by Bloomberg, Lemay and Hanna (2001) have identified reasons for holding stock namely:

i. **Economies of scale**: If a firm buys in bulk they accrue bulk buying discounts. They can realise economies of scale in manufacturing, purchasing and transportation by holding inventory. Transport will move larger volumes of inventory and gets economies of scale through equipment utilisation and manufacturing can have longer production runs if more inventory are stocked, allowing per unit fixed cost reduction.

ii. **Balancing demand and supply**: Some firms must accumulate inventory in advantage of seasonal goods so that production can be kept level throughout the year owing to efficient customer response. This reduces idle plant capacity and maintains a relative stable workforce and keeping cost down.

iii. **Protection from uncertainty**: The prime reason of holding inventory is to offset uncertainty in demand. If demand of inventory exceed supply it means production will ceases until another supply vice versa, which leads to stock out.

2.2. Theoretical Review of Literature

2.2.1. Theory of Enterprise Resource Planning (ERP)

Theory of enterprise resource planning was defined as a complete enterprise business solution to problems of inventory control (Bailey, 2008). Stock and Lambert (2001), argue that ERP is a system that includes the core accounting functions of accounts payable, accounts receivable, and general ledger, coupled with logistics functions, to manage the organization. According to past findings, enterprise resource planning is adopted in many firms in attempt of improving business performance. The effectiveness of an inventory management system depends on the quality of the information it takes in and the ability of the company's information technology (IT) (Nachtmann *et al*., 2006). Lysons and Gillingham

(2005), further explained that enterprise resource planning (ERP) is the latest and possibly the most significant development of material requirement planning (MRP I) and manufacturing resource planning (MRP II).

2.2.2. Vendor Managed Inventory (VMI)

Vendor-Managed Inventory (VMI) is a supply chain strategy where the vendor or supplier is given the responsibility of managing the customer's stock. In the supply chain, the supplier assumes responsibility for the management of inventory at the customer, and takes decisions regarding replenishment (Waller *et al.,* 1999). Under the Vendor Managed Inventory process the manufacturer and retailer are linked via Electronic Data Interchange (EDI) or a secure internet connection. The manufacturer is aware of the retailers' stock levels and point of sale figures. This is usually done by linking the companies Enterprise Resource Planning (ERP) systems together.

2.3   Empirical Studies

Sahari, Tinggi and Kadri (2012), empirically analyzed the relationship between inventory management and firm performance along with capital intensity. For the purpose they took a sample of 82 construction firms in Malaysia for the period 2006–2010. Using the regression and correlation analysis methods, they deduced that inventory management is positively correlated with firm performance. In addition, the results indicate that there is a positive link between inventory management and capital intensity.

Fullerton, McWatters and Fawson (2003), provides empirical support that manufacturing firms that implement higher degrees of modern inventory management techniques should outperform competitors; it was found that a positive relationship exists between firms' profitability and the degree to which waste reducing production practices such as reduced set up times, preventive, maintenance programs, and uniform workloads are

implemented. These findings indicate that manufacturing enterprises employing modern inventory management techniques are consistently more profitable than their counterparts.

Anichebe and Agu (2013), examined the effect of inventory management on organizational effectiveness in selected organizations in Enugu Nigeria, using a descriptive research and a sample size of two hundred and forty-eight (248) respondents, they established that there is significant relationship between good inventory management and organizational effectiveness. Inventory management was found to have a significant effect on organizational productivity. There was a high positive correlation between good inventory management and organizational profitability. They concluded that Inventory Management is very vital to the success and growth of organizations. The entire profitability of an organization is tied to the volume of products sold which has a direct relationship with the quality of the product.

Lazaridis & Dimitrios (2005), studied 131 companies listed on the Athens Stock Exchange showed that mismanagement of inventory will lead to tying up excess capital at the expense of profitable operations and suggested that managers can create value for their firms by keeping inventory to an optimum level.

3.0   METHODOLOGY

The study was carried out in Akure Metropolis, Ondo State, Nigeria. Ondo State is located in the South-Western part of Nigeria. The State is divided into three (3) senatorial districts having Eighteen (18) local government areas. The study was carried out in Akure Metropolis of Ondo-State and it covered twenty-four (24) Food processing sector (Cocoa Processing firms and Bakeries) of the manufacturing industry located within the state capital of Ondo State, Nigeria. The population under study comprised relevant respondents which deals directly with inventory management within the selected firms in Akure South Local Government Area, and therefore copies of questionnaire were distributed purposively to the

selected firms and respondents. Copies of questionnaire were sent to the following group of people which are: procurement officers, production managers, operation managers and owner of the businesses e.tc. A total number of four (4) copies of questionnaire were sent to twenty four (24) selected firms making total of ninety six (96) copies of questionnaire being administered in the entire selected firms within the study area. Both descriptive and inferential statistics were used to analyse the data collected from the field. Mean, Mean Ranking and Pearson Correlation were used for the analysis.

4.0 RESULTS AND DISCUSSION

Ninety six (96) copies of questionnaire were distributed out of which seventy eight (78) which represents (81.3%) were returned. The findings showed that majority of the respondents have spent more than 3years within the current organisation and large percentage of the respondents deals directly with inflow and outflow of materials within the organisation.

4.1: Types of Inventory Management Adopted by Food and Processing Firms

Table 1 presents the types of inventory management adopted by the selected food and processing firms within Akure Metropolis. Mean average ranking was used to analyse various inventory management adopted by the organisation. The types of inventory management adopted include: Continuous stock review practice was frequently used by the selected firms and was rated 1st with mean raking of (4.10) i.e. most firms visited agreed that they frequently review stock on weekly-monthly interval to ascertain the level of stock in the store, so that production process will not be affected with shortage of materials. Material Requirement Planning (MRP) was rated second and was frequently used by the firms with mean values of (4.07), because MRP is a tool that provides answers for several questions: *What* items are required? *How many* are required? *When* are they required? It can be applied both to items that are purchased from outside suppliers and those produced internally. Also, MRP allows

for the input of sales forecasts from sales and marketing. These forecasts determine the raw materials demand. Furthermore, Economic Order Quantity (EOQ) was rated third and averagely used by the selected firms with mean values of (3.62), because economic order quantity is that inventory level which minimizes the total of ordering cost and carrying cost of materials. Bar Coding Identification was rated 4th with mean values of (3.60), because bar codes identification can be used for recording and tracking items and are used for inventory management. An identification code can also identify other information. ABC analysis practice was rated 5th with mean values of (3.37) which averagely used. ABC analysis is an inventory categorization method which consists of dividing items into three categories, A, B and C in the order of valuable items. This method aims to draw managers' attention on the critical few (A items) and not on the trivial many (C-items) in order to keep costs under control within the supply chain. Bin system practice was rated 6th with mean values of (3.34) which was averagely used by the selected firms. This method is used for small items which can be handled easily are stored in bins. The items stored in bins are fast moving. The various types of bins are used depending upon the size of materials; the movable bins are also used. Finally, the use of JIT was rated low by the respondents with mean values of (2.92). The latest technique used is called Just in Time (JIT) is referred practically to no inventory. However, in the present situations in any of the firms visited, it is not absolutely possible to keep no inventory of materials required for production. It shows that the use of JIT delivery system adoption has not been implemented by the firms because they rarely use it.

The findings are in agreement with Hugos (2000) says that inventory management is a set of techniques that are used to manage the inventory levels within different companies in the supply chain. Inventory management and control are crucial to a firm because mismanagement of inventory threatens a firm's viability (Sprague and Wacker, 1996). Similarly, Van Heck, (2009) argues that inventory management is primarily about specifying

the size and placement of stocked goods. Inventory management practices such as continuous

stock review, MRP, EOQ, ABC JIT must be checked on a regular basis and be improved

upon.

Table 1: Inventory Management Practices Adopted by Selected Food and Processing Firms

Inventory Management Adoption	Not Used (1)	Rarely Used (2)	Averagely Used (3)	Frequently Used (4)	Mostly Used (5)	Mean Ranking	Ranking Decision
Continuous Stock Review Practice	0	3	15	31	29	4.10	1st
Material Requirement Planning (MRP) Practice	1	7	10	27	33	4.07	2nd
Economic Order Quantity (EOQ) Practice	5	10	15	27	21	3.62	3rd
Coding Identification Practice	7	8	17	23	23	3.60	4th
ABC Analysis Practice	5	17	18	20	18	3.37	5th
Bin System Practice	8	15	17	18	20	3.34	6th
Just In Time (JIT) Practice	11	18	25	14	10	2.92	7th

Source: Field Survey, 2019

Scale: Not Used: (1)   Rarely Used: (2)

Averagely Used: (3)   Frequently Used: (4)   Mostly Used: (5)

4.2: Effects of Inventory Management Adoption on the Performance of Selected Food and Processing Firms

Table 2 presents the effects of inventory management adoption on the performance selected food and processing firms in Akure Metropolis. Mean ranking was used for the analysis on four (4) point scale of: Strongly Agree (4), Agree (3), Disagree (2), Strongly Disagree (1).

The mean values range from (3.66 to 2.21). The performance of the selected manufacturing firms was based on the following: Majority of the respondents agreed that quality and quantity specifications performance has been greatly affected positively with the adoption of inventory management practices with mean values of (3.66). Also followed by stock level and materials order performance with mean values of (3.60). Furthermore, delivery schedule for materials order performance has been affected greatly with the introduction of inventory management practices adopted by the firms with mean values of (3.55). Respondents also agreed that materials wastage performance has improved due to the facts that level of wastage in materials purchased or in stock has been reduced greatly with mean values of (3.52). Materials ordering and tracking performance with mean values of (3.50). Respondents agreed that their firm was able to order and track materials easily with implementation of inventory management practices. Finally, technology for inventory monitoring and control performance with mean values of (2.21). Majority of the firms disagree that technology has helped them in improving their monitoring and control performance, because most of them have not incorporate the use of technology in their day to day inventory activities. The findings are in agreement with Susan and Michael (2000), that accuracy of inventory records is necessary to determine the replenishment of individual items; ensure that material availability meets project demand, analyse inventory levels and dispose of excess inventory. Susan and Michael (2003), also states that stock records provide the management with the information which is used to ensure accountability through stocktaking and stock audit exercise.

Table 4.2: Effect of Inventory Management Adoption on the Performance of Selected Food and Processing Firms

Effects	Frequencies					Mean Index	Remark
	Strongly Agree (4)	Agree (3)	Disagree (2)	Strongly Disagree (1)	Total		
Quality and Quantity specifications performance	58	15	4	1	286	3.66	Agree
Stock level and materials storage performance	52	21	5	0	281	3.60	Agree
Delivery schedule for materials order performance	54	14	9	1	277	3.55	Agree
Materials wastage performance	51	12	10	5	275	3.52	Agree
Materials ordering and tracking performance	49	19	10	0	273	3.50	Agree
Technology for inventory monitoring and control performance	15	13	24	26	173	2.21	Disagree

Source: *Field Survey, 2019*

SD: Strongly Disagree; D: Disagree; U: Undecided; A: Agree; SA: Strongly Agree

4.3: Hypothesis Testing

H_0:   There is no relationship between inventory management adoption and the performance of selected food and processing firms.

The hypothesis of the study measured the relationship between inventory management adoption and the performance of selected food and processing firms under manufacturing

industry. The hypothesis was tested with the use of Pearson Product Moment Correlation and the outcome presented in table 4.3. The table shows that Pearson Product Moment Correlation Coefficient, r is 0.571 and a significant level, p of 0.015. which confirm that the null hypothesis was rejected while the alternate hypothesis was accepted. Hence, there is a positive relationship of inventory management practices adopted and the performance of selected manufacturing firms in Akure, Ondo State, Nigeria. This implies that the more effective the inventory management techniques or practices adopted, the higher the optimum performance of the firms and vice versa.

Table 4.3: Relationship between Inventory Management Practices Adopted and the Performance of Selected Manufacturing Firms

		Inventory Management Practices Adoption	**Manufacturing Firms Performance**
Inventory Management Practices Adoption	Pearson Correlation	1	.571
	Sig. (2-tailed)		.015
	N	78	78
Manufacturing Firms Performance	Pearson Correlation	.571	1
	Sig. (2-tailed)	.015	
	N	78	78

Source: *Field Survey, 2019*

5.0   CONCLUSION AND RECOMMENDATIONS

5.1   Conclusion

The study analysed inventory management adoption and the performance of selected food and processing firms under manufacturing industry in Akure Metropolis, Ondo State, Nigeria. The study concludes that there is positive relationship between inventory management adoption and the performance of food and processing firms. Inventory management adoption can improve the delivery schedule for materials, reduce materials wastage, management of stock level properly, ensure quality and quantity specifications performance. Inventory management adoption will also reduce workload in handling customers' requests and demands. Also, it will help in increasing the profitability and production capacity of the organization and it will help the organisation to gain from developing capabilities for managing customers, intensive resources, enjoy reduced transaction costs and gain access to rapid flow of information through the use of technology.

5.2   Recommendations

The following was recommended based on the study;

i.   Manufacturing firms should focus more on the use of technology in day to day inventory management activities of the firm and also commit more financial resources.

ii.   Manufacturing firms should improve on their inventory management practices being used, so as to increase revenue generated and reduce workload in handling customers' requests and demands.

iii.   Certified training should be given to the employee to boost their effectiveness and efficiency in the area of inventory management.

iv.   Stock level and materials shortage should be discouraged in order to affect production process.

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