Effect of Inventory Management on Organisational Effectiveness

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Abstract

The study of the "Effects of Inventory Management on Organizational Effectiveness in selected organizations in Enugu, was carried out, to asses the impact of proper inventory management on organizational performances in Emenite, Hardis & Dromedas and the Nigeria Bottling Company all in Enugu, Enugu State. Descriptive research method, especially survey and case study were employed in carrying out the study. The population of the study is six hundred and fifty eight (658). A sample size of two hundred and fouthy eight (248), was derived using the Taro Yamene formula for sample size determination from a finite population. Data were generated using questionnaire, oral interviews, observations, books, journals and the internet. Data were presented in tables and analyzed using simple percentages. Pearson product moment correlation coefficient and linear regression was used in the hypotheses testing. From the analyses, it was discovered that irrespective of the fact that the organizations studied, painted the picture that they were applying the tenets of good inventory management, they from time to time run into the problems of inventory inadequacy. This consequently affected their production, leading to the scarcity of one brand of their products or the other, thereby affecting their profitability and consequential effectiveness negatively. The Findings indicate that there is significant relationship between good inventory management and organizational effectiveness. Inventory management has a significant effect on organizational productivity. There is highly positive correlation between good inventory management and organizational profitability. The study 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 Against this background the study recommended that Organizations should diversify their inventory system to suit specific needs of production, and that management should closely monitor and manipulate their inventory system to maintain production consistency for organizational profitability and effectiveness.

Keywords: Inventory management, Organisational effectiveness, Firms

Introduction

Inventories are vital to the successful functioning of manufacturing and retailing organizations. They may consist of raw materials, work-in-progress, spare parts/consumables, and finished goods. It is not necessary that an organization has all these inventory classes. But, whatever may be the inventory items, they need efficient management as, generally, a substantial share of its funds is invested in them. Different departments within the same organization adopt different attitude towards inventory. This is mainly because the particular functions performed by a department influence the department's motivation. For example, the sales department might desire large stock in reserve to meet virtually every demand that comes. The production department similarly would ask for stocks of materials so that the production system runs uninterrupted. On the other hand, the finance department would always argue for a minimum investment in stocks so that the funds could be used elsewhere for other better purposes, (Vohra, 2008:427).

Inventory represents an important decision variable at all stages of product manufacturing, distribution and sales, in addition to being a major portion of total current assets of many organizations. Inventory often represents as much as 40% of total capital of industrial organizations (Moore, Lee and Taylor, 2003:321). It many represent 33% of company assets and as much as 90% of working capital, (Sawaya Jr. and Giauque, 2006:121). Since inventory constitutes a major segment of total investment, it is crucial that good inventory management be practiced to ensure organizational growth and profitability.

According to Temeng et al (2010:195), historically, however organizations have ignored the potential savings from proper inventory management, treating inventory as a necessary evil and not as an asset requiring management. As a result, many inventory systems are based on arbitrary rules. Unfortunately, it is not unusual for some organizations to have more funds invested in inventory than necessary and still not be able to meet customer demands because of poor distribution of investment among inventory items (Temeng, Eshun and Essey, 2010:199). Based on the above analogy, therefore this paper evaluates the inventory management and organizational effectiveness in manufacturing organizations in Enugu State, with respect to: Emenite and Hardis and Dromedas both at Emene Enugu as well as the Nigeria Bottling Company at 9th Mile concern also in Enugu.

Statement 0f the Problem

Problems of inventory management and control have been around for a very long time. The need to collect food when it is readily available and then store it for times of shortage is perhaps the fundamental stock holding problem, which was tackled long ago by man. Nowadays, we usually think of stocks being held by organizations to allow efficient and continuous operations.

Managers are aware of the vital roles inventory plays in the activities of organizations. In most organizations, direct materials represent up to 50% of the total product cost, as a result of the money entrusted on inventory, thereby affecting the profitability of the organization. Organizations at times do not control their inventory holding, resulting in under stocking and causing the organizations to stay off production, thereby resulting to organizational ineffectiveness. This therefore creates relationship problems between inventory management and organizational productivity, profitability and effectiveness,

Objectives of the Study

The broad objective of this study is to evaluate the effects of inventory management on the effectiveness of manufacturing organizations in Nigeria, while the specific objectives are:-

1.   To examine the nature of relationship between inventory management and organizational effectiveness.
2.   To determine the effect of inventory management on organizational productivity.
3.   To evaluate the nature of correlation between inventory management and organizational profitability.

Research Questions

The following questions will guide the study;

1.   What is the nature of relationship between inventory management and organizational effectiveness?
2.   What is the effect of inventory management on organizational productivity?
3.   To what extent does inventory management correlate with organizational profitability?

Research Hypotheses

The following research hypotheses were formulated for the study;

H_1:   There is significant relationship between inventory management and organizational effectiveness.
H_2:   There is significant positive effect inventory management on organizational productivity
H_3:   There is positive correlation between inventory management and organizational profitability

Review of Related Literature

Inventory is the stock of any item or resource used in an organization. An inventory system is the set of policies and controls that monitors levels of inventory and determines what levels should be maintained, when stock should be replenished, and how large orders should be, (Chase and Aquilano, 1995:546). On the other hand, management is an act of organizational design. The basic functions of management is to identify for a focal business organization areas of crucial contingencies and constraints so that the business organization can make structural responses to include these constraints and contingencies within its boundary. (Onwuchekwa, 1993:193).

Inventory management therefore has been defined in many ways by many authors. As expected, these authors defined inventory management based on their perception of the subject matter. Nwandu, (2006:171) defines inventory management as a form of administration control that is particularly essential in all manufacturing, wholesale and retail organizations. The essence of inventory according to Nwandu is, "to have the right goods quality and quantity, at the right place and time". The essence of inventory management for a contemporary organization. This process is needed as a part of supply chain network to protect production system against any kind of disturbance. Orga (2006:66), defines inventory control as a process of ensuring that the right quality of the relevant stock is available at the right time and in the right place. Nweze (2004:423), on his own part defines inventory control as the means of ensuring that actual flow of inventory in an organization conforms with plan. From the foregoing therefore, one infers that inventory management is the act of ensuring that balanced items of stock are maintained at the right quantity, quality, place and time in an organization, to ensure organizational business continuum.

Types of Inventory

Ile (2002:371), opines that inventory is classified into three types which include;

i.   Raw Material inventory
ii.   Work-in-progress inventory
iii.   Finished goods inventory

Raw material inventory:

This includes all items purchased by an organization for processing. For instance, Flour, yeast, eggs etc. are all part of raw materials inventory of a confectionary organization.

Work-In-Progress Inventory

This is also called goods-in-progress inventory. This is an intermediate stage of raw material inventory that is yet to be finished by the plant to enter into another stage of processing. These are materials that have been partly processed but are yet uncompleted.

 Finished Goods Inventory

This is the stock of finished goods. These could be stock of goods awaiting shipment or in the warehouse, the level of finished goods stock is a matter of co-ordination between the production and sales departments of the organization.

Purposes for Holding Inventory

According to Banjoko (2004:192), manufacturing organizations carry inventories for a variety of reasons. Inventories perform significant functions in the total production system and since "it is physically impossible and economically impracticable for each stock of item to arrive exactly where and when it is needed", there is need to keep some amount of inventory at any point in time. Banjoko outlined seven reasons for holding inventories, which include;

1.   To enhance uninterrupted flow of production
2.   To meet variations in product demand.
3.   To allow flexibility in production scheduling
4.   To decouple successive stages of operations
5.   To level production activities
6.   To provide a means of hedging against future prices and delivery uncertainties
7.   To provide a means of obtaining economic lot size and gaining quantity discounts.

On their own part, Chase and Aquilano (1995:547) enumerated five reasons for holding inventories. They are,

1.   To maintain independence of operations
2.   To meet variations in product demand
3.   To allow flexibility in production scheduling
4.   To provide a safeguard for variation in raw material delivery time
5.   To take advantage of economic purchase order size.

        From the foregoing, one observes that the authors are saying virtually the same thing, despite the fact that Banjoko considered seven reasons against five proffered by Chase and Aquilano. We therefore subscribe to their views for holding inventories, and conclude that the reasons for holding inventories are to minimize cost and consequently, maximize profit in an organization.

Inventory System

The cardinal objective of inventory management is the maintenance of an optimum level of inventory necessary to support the production system at any time and at the least cost possible. The attainment of this objective entails taking decisions with respect to the determination of an appropriate order quantity, when to place the order and how much inventory to carry per unit of time. These various decision variables will, at any time, dictate the behaviour of any inventory system. Inventory ordering systems reflect part of the strategies available to an organization in meeting its inventory management objectives. Basically, there are three major inventory ordering systems, the fixed – order quantity system, the fixed-order interval system and the ABC inventory analysis system.

The Fixed-Order Quantity System

In the fixed-order size system, orders for a fixed quantity of items are placed for each inventory cycle. The time of ordering may vary but the quantity ordered per period is always the same. This system is sometimes referred to as the (Q,R) system. When inventory level gets as low as point R (reorder point), an order is placed for Q units of inventory.

The Fixed-Order Interval System

The fixed-order interval system examines the status of inventory level at specific periods and tries to bring the inventory level to a desired point, if the inventory level has gone below the minimum required point in-between the time of the periodic reviews.

The ABC Inventory Analysis

Effective control of inventories can be costly, time and effort consuming. Experience has shown, however, that not all items kept in inventory require such meticulous and close-study monitoring particularly if such items are low-value items that are randomly used in the production system. There are some items, however, whose

quantities are small but whose monetary values are exorbitant. These are usually the high class items whose values run into thousands of Naira per unit. They normally account for between 10-20 per cent of total items kept in inventory, while they account for as high as between 70-80 per cent of the total monetary value of investment in inventory. These are the so called "significant few" inventory items usually designated as belonging to the A group. There are also those items that account for between 30-40 per cent of the total items of inventory and at the same time, take as much as 15-20 per cent of the monetary value of total investment in inventory. This group of items are classified into group B for purposes of effective management. The last class of inventory items fall into group C. These are the items that are usually greater in number but account for the smallest value of the total monetary investment in inventory. This group of inventory items is referred to as the "insignificant many".

The purpose of the ABC inventory classification is to be able to assess the status of every item kept in inventory in addition to determining what specific attention is required by each group of inventory (Banjoko, 2004:198). From the study, it was discovered that, Emenite and Hardis and Dromedas operate the fixed-order quantity of inventory system. This was evident in their production pattern of various brands of products. Their requirements for individual items of inventory had been determined and this led to continuous production of varied products, resulting in their consistency in products availability. On the other hand, the Nigeria Bottling Company operates the fixed–order interval inventory system. This was evident in their production pattern which results into the unavailability of one brand of their products and surplus of another at one time or the other. On this, we infer that organizations should be conscious of their production pattern which is a function of their product demand and try to tailor their inventory system toward that.

Inventory Control

Throughout the inventory chain from raw material through to retail stocks, inventories are planned and controlled item by item. For each item in every inventory, two questions must be answered again and again:

1.   How many of this item should be ordered?
2.   When should it be ordered?

The classic approach to Inventory Control is the widely known "economic order quantity" (EOQ) model also known as the economic lot size (LES) model (Plossl, 2005:64). Although offered as a general model for all inventories, in fact the model is quite limited in its appropriate best to a subset of manufacturing inventory items, where the item under consideration has no relationship to other parts, experiences, demand which can be statistically forecasted and which requires the use of productive capacity in order to 'set up' prepare to work on the item.

The EOQ model is based on certain assumptions which include;

1.   Known and constant demand,
2.   Instantaneous replenishment,
3.   Backorder is not allowed
4.   No constraints on order size
5.   Cost of order is constant
6.   Unit price is constant, (Banjoko, 2004:198).

According to Ile (2002:372), the methods that are used for the control of inventories include

a.   Perpetual inventory method,
b.   Physical inventory method,
c.   Materials-control cycle method.

Perpetual Inventory Method

This is also called balance of stores record. The balance of stores record plays the central role in the inventory control system, particularly in a job-order-plant. It controls the movement of each item of inventory as it goes in and out of stock and shows the current balance at hand.

Physical Inventory Method

Some discrepancies between inventory records and quantities at hand cannot be ruled out. An actual count of all items at hand is periodically necessary for effective inventory control. The method selected depends upon the size and diversity of stock, the degree to which work process is standardized and the processing methods employed in a particular plant.

Material Control Cycle Method

An efficient system must be designed for the control of material from the time of requisitioning of purchase to the storage of the finished product. A step by step standard routine must be developed, authority and responsibility for the execution of each step, must be clearly delegated to specific individuals.

From the above, one can observe that the three methods of inventory control are interwoven. This is from the point of view that physical inventory items can not be determined without the material control cycle method which monitors the step-by-step movement of inventory from entry point to exit point and the material control cycle cannot be effective without the application of the perpetual inventory method. Therefore the three methods of inventory control are complementary.

Young (2002:10) admits that an alternative approach to inventory control (for manufacturing inventories in particular) is to consider inventory as a residual and not control it directly. This is the central theme of just-in-time (JIT) system, in which attentions is focused on the eliminations of waste, the reduction of variability, close linkage among all systems, and process standardization and rationalization (Ohno, 2008:21) .These systems are based on the fact that myriad decisions about manufacturing are often made with reference to the resulting impact on inventory positions. Explicit consideration of issues that can result in inventory growth or depletion can eliminate the causes of such growth or depletion and prevent them.

Method and Materials

The study was carried out primarily through the survey method and interview of employees in three manufacturing firms in Enugu state Nigeria which include Emenite, Hardis and NBC.   Secondary data were obtained through books, journals, and internet. A sample size of 248 was obtained from the population of 658 at 5% error tolerance and 95% degree of freedom using yamane's statistical formular. 208(84%) of the questionnaire distributed were returned while 40 (16%) of the questionnaire distributed were not returned. The questionnaire was designed in likert scale format. The researcher conducted a pre-test on the questionnaire to ensure the validity of the instrument. Data collected were presented in frequency tables.

Data Analysis and Discussion

The data obtained from the field were presented and analyzed with descriptive statistics to provide answers for the research questions while the corresponding hypotheses were tested with Pearson's Correlation and Linear regression at 0.05 alpha level.

What is the nature of relationship between inventory management and organisational effectiveness

Table 1: Coded Responses on inventory management and organizational   effectiveness .

s/no	Questionnaire items	S.Agree /Agree		Disagree /S.Disagree		Undecided		
		Freq	%	Freq	%	Freq	%	Total (Freg)
1	Inventory management increase share market of a company?	190	91	8	4	10	5	208
2	High return on investment can be achieved through effective inventory management?	201	97	3	1	4	2	208
	TOTAL	391		11		14		416

Source: fieldwork 2012

According to table (1) based on aggregate response 806(88%) indicated strongly agree, 74(8) indicated disagree while 32 (4%) indicated undecided. This implies that there is a relationship between job satisfaction and organizational commitment among secondary school teachers in Enugu State.

Hi $_1$: there is a significant relationship between inventory management and organisational effectiveness

Table 2 Descriptive Statistics between inventory management and organisational effectiveness

	Mean	Std. Deviation	N
inventory management	1.8654	1.11258	208
organisational effectiveness	2.2452	1.31967	208

Table 3 Correlations between inventory management and organisational effectiveness

		inventory management	organisational effectiveness
inventory management	Pearson Correlation	1	.898(**)
	Sig. (2-tailed)		.000
	N	208	208
organisational effectiveness	Pearson Correlation	.898(**)	1
	Sig. (2-tailed)	.000	
	N	208	208

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

Table 2 shows the descriptive statistics of the inventory management via organisational effectiveness, with a mean response of 1.8654 and std. deviation of 1.11258 for inventory management and a mean response of 2.2452 and std. deviation of 1.31967 for organisational effectiveness and number of respondents (208). By careful observation of standard deviation values, there is no much difference in terms of the standard deviation scores. This implies that there is about the same variability of data points between the dependent and independent variables.

 Table 3 is the Pearson correlation coefficient for inventory management and Organisational effectiveness. The correlation coefficient shows 0.898. This value indicates that correlation is significant at 0.05 level (2tailed) and implies that there is a positive relationship between inventory management and organisational effectiveness (r = .898). The computed correlations coefficient is greater than the table value of r = .195 with 206 degrees of freedom   (df. = n-2) at alpha level for a two-tailed test (r = .898, p< .05). However, since the computed r = .898, is greater than the table value of .195 we reject the null hypothesis and conclude that there is a   positive relationship between inventory management and organisational effectiveness (r =.898, P<.05).

What is the nature of the effect between inventory management and productivity
Table 4: Coded Responses on inventory management and productivity

s/no	Questionnaire items	S.Agree /Agree		Disagree /S.Disagree		Undecided		
		Freq	%	Freq	%	Freq	%	Total (Freg)
1	Inventory management enhances organisational competitive position in the industry	194	93	10	5	4	2	208
2	Development of products and services with high profit margin is as a result good inventory management?	204	98	2	1	2	1	208
	TOTAL	398		12		6		416

Source: fieldwork 2012
According to table (4) based on aggregate response 398(96%) indicated strongly agree, 12(3%) indicated disagree while 6 (1%) indicated undecided. This implies that there is a significant positive effect inventory management on organisational productivity.

Hi: inventory management has a positive effect on organisational productivity
Table 5 SPSS result of the effect of inventory management on organisational productivity

Particulars	R	R^2	Adj.R^2	DW	Standard Coefficients		F	Sig.
					Beta	T- Value		
firms	0.614[a]	0.377	0.374	.120	0.614	11.175	126.889	0.000

SOURCE: SPSS
NOTE:
R   =   Correlation Coefficient or Beta
R^2 =   Coefficient of Determination
Adj. R^2 =   Adjusted Coefficient of Determination

DW   =   Durbin Watson (d) test statistic
T-value =   Student t- test Statistic
F   =   F- test statistic
Model Equation **IM** = 0.574 + 0.844 **OP**

The result indicate that there was a positive significant effect of inventory management on organisational productivity as t = 11.175 and which is above the rule of thumb positivity of 2 and the coefficient of inventory management is (0.574). the variations from the model is explained by the model as indicated from the coefficient of the determination (r^2) value of 61.4%.

Also the result indicates that there is a positive relationship between inventory management and organisational productivity as indicated by r value of 0.614 which is positive as shown by beta value of 0.614

To what extent does inventory management correlate with organisational profitability.
Table 6: Coded Responses on inventory management and organizational   profitability.

s/no	Questionnaire items	S.Agree /Agree		Disagree /S.Disagree		Undecided		
		Freq	**%**	**Freq**	**%**	**Freq**	**%**	**Total (Freg)**
1	There is positive relationship between inventory management increase shareholder wealth?	**190**	**91**	**8**	**4**	**10**	**5**	**208**
2	Inventory management promotes organisational net income growth?	**201**	**97**	**3**	**1**	**4**	**2**	**208**
	TOTAL	**391**		**11**		**14**		**416**

Source: fieldwork 2012

According to table (6) based on aggregate response 806(88%) indicated strongly agree, 74(8) indicated disagree while 32 (4%) indicated undecided. This implies that there is a relationship between job satisfaction and organizational commitment among secondary school teachers in Enugu State.

Hi $_1$: there is a positive correlation between inventory management and organisational profitability
Table 7 Descriptive Statistics of correlation between inventory management and organisational profitability

	Mean	Std. Deviation	N
inventory management	1.9519	1.08017	208
organisational profitability	2.2644	1.30857	208

Table 8 Correlations between inventory management and organisational profitability

		inventory management	organisational profitability
inventory management	Pearson Correlation	1	.843(**)
	Sig. (2-tailed)		.000
	N	208	208
organisational profitability	Pearson Correlation	.843(**)	1
	Sig. (2-tailed)	.000	
	N	208	208

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

Table 7 shows the descriptive statistics of the inventory management via organisational profitability, with a mean response of 1.9519 and std. deviation of 1.08017 for inventory management and a mean response of 2.2644 and std. deviation of 1.30857 for organisational profitability and number of respondents (208). By careful observation of standard deviation values, there is no much difference in terms of the standard deviation scores. This implies that there is about the same variability of data points between the dependent and independent variables.
 Table 8 is the Pearson correlation coefficient for inventory management and Organisational profitability. The

correlation coefficient shows 0.843. This value indicates that correlation is significant at 0.05 level (2tailed) and implies that there is a positive relationship between inventory management and organisational profitability (r = .843). The computed correlations coefficient is greater than the table value of r = .195 with 206 degrees of freedom (df. = n-2) at alpha level for a two-tailed test (r = .843, p< .05). However, since the computed r = .843, is greater than the table value of .195 we reject the null hypothesis and conclude that there is a positive correlation between inventory management and organisational profitability (r =.843, P<.05).

Findings

After testing of the hypotheses, it was discovered that there was

There is significant relationship between good inventory management and organizational effectiveness(r =.898, P<.05).

Inventory management has a significant effect on organizational productivity(r =.614; t= 11.175; P<.05).

There is highly positive correlation between good inventory management and organizational profitability(r =.843, P<.05).

However, it was found that the organizations under study at times run into problems of inadequate stock of inventory which consequently affected their production, leading to scarcity of one brand of their products or the other thereby affecting their profitability and consequential effectiveness.

CONCLUSION

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. Management does a lot to present a good organization to the public in terms of quality production.

Good inventory management in any manufacturing organization, saves the organization from poor quality production, disappointment of seasoned customers, loss of profit and good social responsibility, (Johnson, 2008:40). This is done by ensuring timely delivery of raw materials to the factory and distribution of finished goods, in order of production to the warehouse. If inventory management is not adequately maintained, production cannot meet the aspirations of customers which is loss of revenue to the organization. Right from procurement to the time of processing, quality of raw material is the chief determinant of the productive efficiency of any manufacturing concern. This varies from organization to organization.

In Emenite, the raw materials are volatile and chiefly cement which is procured locally. The processing machines and technology are, however imported. In Hardis and Dromedas, the raw materials are many, and are up to 90% locally sourced. Special chemicals are however, imported. In the Nigeria Bottling Company, the main raw materials are colour and Reagent, which is imported. Other raw materials are water and sucrose which are locally sourced. The organizations combine the First-in-First-out (FIFO) and Average Methods in their inventory allocations.

Recommendations

In line with the findings, the following recommendations are made:

1. The organizations should diversify their inventory system, to suit specific needs of production.
2. Inventory management should maximize space and timely delivery to avoid staying off production.
3. The overriding need for any method of stock allocation should be customer satisfaction.
4. Cost minimization techniques should be employed in the keeping and allocation of inventory.
5. Management should closely monitor and manipulate their inventory system to maintain production consistency for organizational profitability and effectiveness.

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