

**EFFECT OF INVENTORY MANAGEMENT PRACTICES ON SUPPLY CHAIN
PERFORMANCE IN INDUSTRIES IN KENYA, SURVEY OF SELECTED SOFT DRINKS
MANUFACTURING FIRMS IN WESTERN KENYA**

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Abstract

Inventory management is critical to an organizations success in today's competitive and dynamic market. This study sought to establish the effect of inventory management practices on supply chain performance, survey study of selected soft drinks of manufacturing firms in western Kenya. The study was guided by the following specific objectives; to establish the effects of lean Inventory practices on supply chain performance, to establish the effects of strategic supplier partnerships on supply chain performance and to find out the effects of information Technology on supply chain performance of soft drinks of manufacturing firms in western Kenya. The study adopted a survey design. The targeted population of the study includes supply chain management employees of soft drinks of manufacturing firms in western Kenya whose population is (150). The researcher used questionnaires with both open and closed ended questions to collect data. The data was analyzed using descriptive statistical methods of frequencies and percentages. Then the results were presented in form of tables. From the research findings, the study concludes that; improved production is one of the effects of inventory practices on supply chain performance of soft drinks manufacturing firms in western Kenya, similarly, the study established that quality service delivery, enhanced demand forecast, enhanced supply chain performance, reduced inventory, reduction in storage and profit improvement are also some of the effects of inventory practices on supply chain performance in an organization. Therefore, this study recommends review of the order management, in the inventory management in the manufacturing sector to ensure that timely planning is done to ensure timely acquisition. The study recommends that the manufacturing industry should embrace inventory management techniques so that they can reap from the immense benefits accrued from implementation.

Keywords: Lean Inventory, strategic supplier partnerships, supply chain performance, information Technology

I. INTRODUCTION

1.1 Background to the Study

Inventory management is an act of safe keeping some valuable items for future use and to produce them when the need arises. In America, inventory contributes to almost sixty percent 60% of the annual turnover in the manufacturing firms (Anderson, 1987), according to Barnes (2008) a European research says that inventory is looked at as a liability under the just-in-time control system but he agrees with the way accountants treat it as an asset to the organization. Based on the statement of financial situation, inventory seemsto be under the current assets of the entityirrespectiveof whether it's profit or not for profit entity.

Inventory management is a critical management issue for manufacturing companies. Inventories are vital to the successful functioning of manufacturing organizations. According to Buffa and Sarin (2007) there are several reasons for keeping inventory. Inventories may consist of raw materials, work-in-progress, spare parts/consumables, and finished goods. It is not necessary that a company has all these inventory classes. But whatever may be, the inventory items, need management as, generally, a substantial share of an Organization's funds is invested in them. Diversesections within the same company assume different perception about inventory. For instance, the sales section might wishfor a large stock in reserve to keep up virtually with every issue that comes. The production department similarly would ask for stocks of materials so that the production system runs uninterrupted. Conversely, the finance subdivision would continuouslycontend for a minimum investment in stocks so that the coffers could be used somewhere else for other better reasons, (Vohra, 2008).

The procurement function is responsible for managing the purchasing activity for the company (Lysons, 2012). There are two types of purchasing or procurement departments: centralized and decentralized. In a centralized model, all requests for materials or goods are center to this department. In a decentralized model, individual departments can process their own purchases. Irrespective of the structural model used procurement is subject to more inspection and appraisal than any other process.

In Kenya, Kavulya(2004) it was found that Just-in-time (JIT) contributes greatly to an organization's positive performance and customer satisfaction, it was further established that. Management of inventory determines the way an organization will thrust itself to high performance efficiency. Some organizations have resulted to vendor managed inventory (VMI) systems which aid the supplier to monitor customer's inventory usage. Through this VMI system, customers will avoid stock outs because the suppliers will have already replenished

their inventory. The key aspect here is communication which should be planned well from the beginning of business relations between the supplier and the customer.

For the Kenya Seed Company KSC, in Kisii town, Kisii county Ondieki et al 2006 in his study, established that inventory management techniques and organizational performance of the Company need to be scrutinized so that the organization does not utilize a huge chunk of its budget on holding inventory. Hence, the total cost model needs to be balanced by ensuring purchase costs, ordering costs and holding costs are minimal so that the firm can reap good profits and maintains its budgetary allocation for non-governmental organizations supply chain management, he says that managing supply chain cost is the most important aspect of an organization; to achieve this, an organization has to employ qualified professional who understand inventory management techniques. Six sigma, total quality management (TQM), Lean, just-in-time coupled with theory of constraints are the notable techniques (Mackay, 2013). These past studies even though have attempted to exercise some of the inventory management practices, they have fallen sort by not emphasizing more on the effect of inventory management practices on supply chain performance on which the study will concentrate at with close reference to selected soft drinks manufacturing firms in western Kenya.

1.2 Statement of the Problem

In most organizations, there is no effective inventory management practices to enable organization has enough inventories to satisfy the demands of its customers hence every now and then they lose customers due to inventory shortages. This has led to organization keeping excess inventory because of the cost implications. Frahm, (2003) says that the actual position on the ground is that due to improper inventory management practices organizations do carry excess inventories or shortage of inventories leading to overstocking or under stocking respectively. Mackay, (2013), on his study on vendor managed inventory on Dunlop tire company of Germany, established that this practice saves an organization immense finance and time since the supplier will be able to monitor its customer's inventory levels and make a point of replenishing them. Otieno (2011) on Kenya Seed Company found out that companies which are able to manage their long term business relationship by crafting mutually beneficial supply chains normally have high global volume, regular and standardized (predictable) demand, supply requirements and low switching costs. Syntetos (2010) is of the opinion that inventory management must be well organized to create an efficient order. The above mentioned scholars had left a gap on the effect of inventory management practices on supply chain performance on which the researcher concentrated at with reference to selected soft drinks manufacturing firms in western Kenya.

1.3 Objectives of the study

1.3.1 General Objective

The general objective of this study was to establish the effect of inventory management practices on supply chain performance in industries, a survey of selected soft drinks manufacturing firms in western Kenya.

1.3.2 Specific Objectives

The study was guided by the following specific objectives;

- i. To establish the effects of lean inventory management practices on supply chain performance of soft drinks manufacturing firms in western Kenya
- ii. To establish the effects of strategic supplier partnerships on supply chain performance of soft drinks manufacturing firms in western Kenya
- iii. To find out the effects of information technology on supply chain performance of soft drinks manufacturing firms in western Kenya?

II. LITERATURE REVIEW

2.1 Theoretical Framework

2.1.1 Strategic Choice Theory (SCT)

The strategic choice theory is about the choices made by top management in order to improve the performance. It is a theory that Child (1972) mentioned as one that is deeply about the choices or decisions made by managers so as to have a positive impact on the organizational performance. Campling and Michelson (1998) recognized a strategic choice model that portrays the interdependence among the environment and entities, activities and general firm performance. Child (1972) further noted that the top management must thus have the power and responsibility to direct the movement of goods and services within their ranks. These movements include inventory management, supplier interaction, communication and innovation among others. Ketchen and Hult (2007) on their part look at SCT as a means through which managers work from bottom to top to enact changes including Just-in-Time and leans management in a bid to improve inventory management and this makes this theory appropriate for the study.

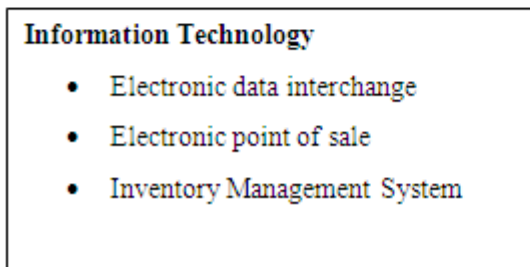
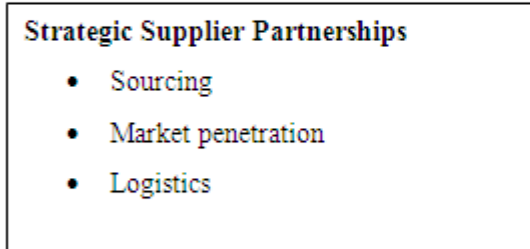
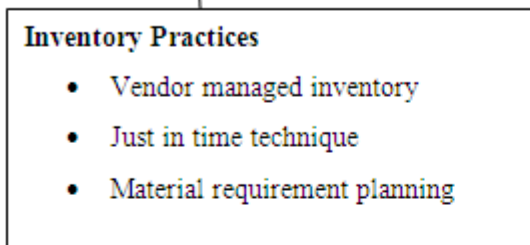
2.1.2 Theory of Economic Order Quantity (Wilson's EOQ Model)

The EQQ Model is concerned about the maintenance of optimal inventory levels for organizations as espoused by Haris (1913). Blackburn (2010), Supports the inclusion of EQQ as a means to explain inventory management exhaustively. The theory explains that inventory costs increase or decrease depending on the mechanisms laid down for its management. It allocates points depending on the optimal inventory curve and the trajectory the whole process goes through. It postulates that for each item stocked, there is need to look at the point of order and

the most appropriate quantity to order. These variables then play themselves well if better managed. Thus the theory becomes important for the present study because inventory management require a formula to help better manage the costs attendant to it.

2.2 Conceptual Framework

Independent Variables



Dependent Variables

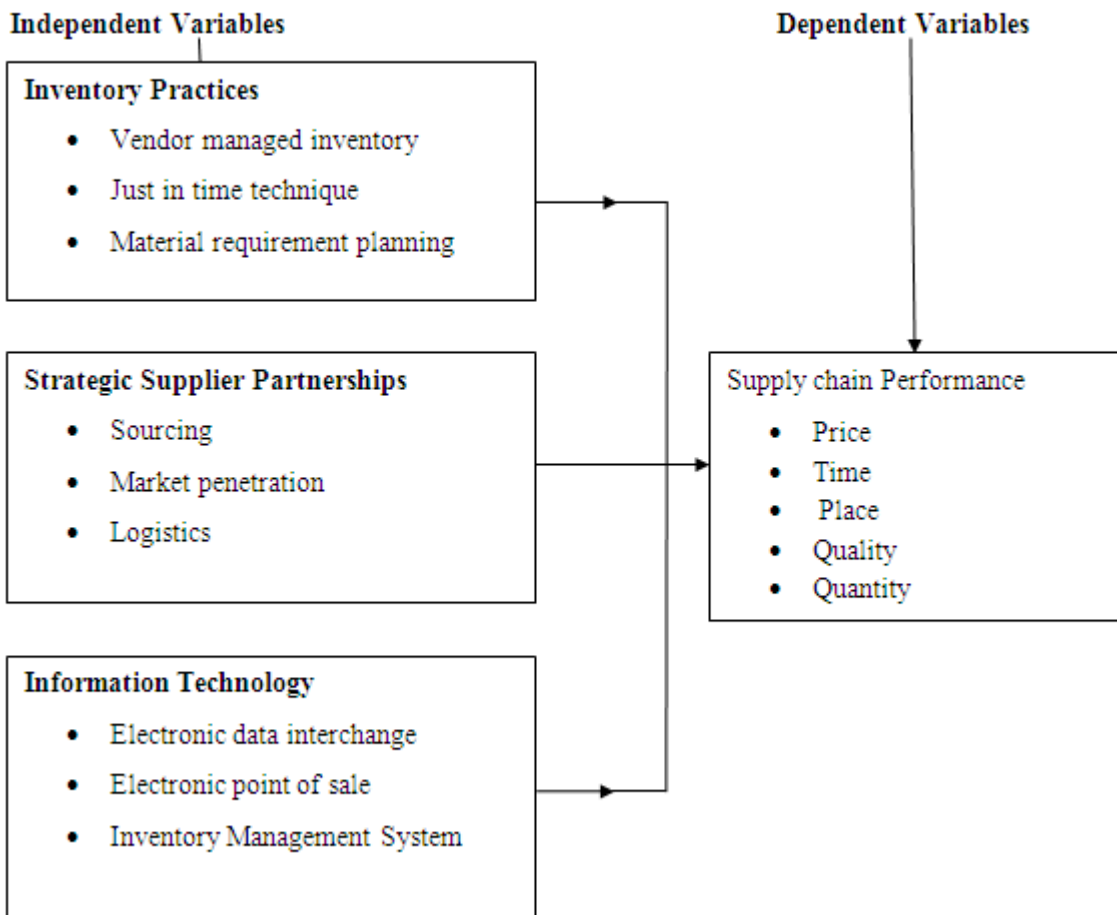
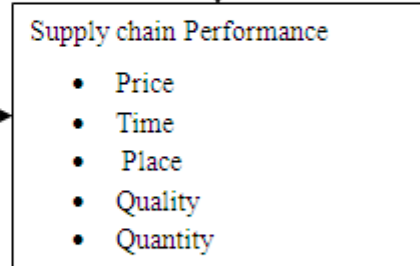


Fig. 2.1 Conceptual Framework

2.3 Empirical Literature Review

Womack et al (2003) did a study on inventory management and procurement performance of manufacturing firms in the USA. The study noted that inventory management saved overall costs, created a better process for procurement function and improved the overall performance

of organizations. There was however need to look at inventory management in the Kenyan set up.

Brigham and Gapenski, (2010) noted that inventory management is acquiring significant traction as a competitive element for organizations. The study noted that the process needs better management as substantial inventory leads to a bleeding cash flow which negatively impact not only on procurement functions but overall performance. Lysons and Gillingham (2003) in their study of inventory management and particularly Just-In-Time described it as a collection of activities that eliminate waste and saves time. It means that product design may be shared, single sourcing may be encouraged, reduced set up time for machine and elements of leans management employed.

Carter and Price (2010) assert that information is the life blood of all organizations. An Inventory manager needs information technology in order to succeed in his work. Computers can assist in stock control in calculating the optimum amount of stock to hold and dispatch in order to satisfy the user requirements. The computer can do this by comparing inventory variables (stock levels, demand and delivery dates). The Electronic Data Interchange, EDI is a system which enables direct communication between organizations without there being any human intervention. This technology has revolutionized inventory management. EDI is the name given to the transmission and receipt of structured data by the computer systems of trading partners, often without human intervention. The international Data interchange association defines EDI as “the transfer of structured data, by agreed message standards from one computer system to another, by electronic means (Jessop, 2006). With the EDI system linking the buying organization with its suppliers, the replenishment can be triggered at the instant the need arises and the message is transferred from the original destination without further possibility of corruption en route.

III. RESEARCH METHODOLOGY

3.1 Research Design

The study assimilated a descriptive survey research design. This was so as the design allows for a description of events as they occur at the time of study and also allows for prediction of events. It describes and explains rather than predict a phenomenon (Kothari, 2006).

3.2 Target Population

The target population of the study focused on supply chain management employees of soft drinks manufacturing firms in western Kenya whose population is (150). According to Mugenda and Mugenda (1999) a population comprises the total number of cases/items featured in the study.

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Table 1 Target Population

	Procurement	Finance	Marketing	HR	Logistics	ICT	Total	% Sample size		
A	6	8	25		2	2	3	46	31	33
B	7	4	25		3	12	5	46	31	33
C	7	4	30		4	10	3	58	39	43
Total	20	16	70		9	24	11	150	100	109

3.3 Sample Size and Sampling Procedure

The sample size for the study was determined according to (Kothari 2006) and (Mugenda & Mugenda 2003).

$$n = \frac{N}{1 + N(e)^2}$$

Where n = required sample size

N = the given population size

e = population proportion assumed to be 0.05 as this yields the maximum possible sample size required

$$n = \frac{150}{1 + 150(0.05)^2}$$

$$n = \frac{150}{1 + 0.375}$$

$$n = \frac{150}{1.375}$$

$$n = 109$$

3.4 Data collection Instruments

For the purpose of the study, the researcher used questionnaires with both open and closed ended questions, the questionnaires were designed in such a way that it begins with the closed ended questions, in the order of ease of answering and end with open ended questions. The advantage of such questions is that the respondents get motivated as they keep on answering what is perceived to be difficult questions. Questionnaires are the most appropriate as they permit a greater response from the respondent, thus enabling more detailed data on the subject to be obtained. This is also because the nature of data to be collected, the time available as well as the objectives of the study, the target population is also largely literate and are unlikely to

have difficulty responding to questionnaire items .The questionnaires were given out to the respondents and a follow up made by phone on the progress .Finally they were collected at the end of the agreed period, which was two weeks.

3.5 Data Analysis and Presentations

Data analysis entails separation of data into constituent part and examination of the same to distinguish its component parts separately and in relation to the whole .Descriptive analysis was used to display the same after collection of data, editing was done. The edited data was organized and coded. This was done by considering similar views and responses and grouping them together. The data was tabulated according to variables where each table represented a variable. The data was analyzed using descriptive statistical methods of cumulative frequencies and percentages. Then the results were presented in form of tables.

$$\alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Where

Y= supply chain performance

X₁= inventory management practices

X₂=strategic supplier partnership

X₃=information technology

$\beta_1 \beta_2 \beta_3$ = predictor variables

IV. RESULTS AND DISCUSSION

4.1 Regression Analysis

The research study uses multiple regression analysis in order to analyze impact of independent variables on dependent variable. The multiple regression models are as under:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon \dots \dots \dots (1)$$

Where Y is supply chain performance (dependent variable)

α is constant

X is other factors affecting Performance

β is the regression coefficient which may be positively or negatively affecting dependent and independent variables.

$$EP = \alpha + \beta_1IMP + \beta_2 SSP + \beta_3IT + \beta_4R\&R + \varepsilon \dots \dots \dots (2)$$

Where SCP = Supply Chain Performance (Dependent Variable) β_1IMP = inventory management practices (I.V) β_2SSP = strategic supplier partnership (I.V), β_3IT = Information technology (I.V).

Table 2 Model summary of supply chain performance, inventory management practices, strategic supplier partnership, information technology

ANOVA^b

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	257.950	4	64.488	120.135	.000^a
Residual	104.670	195	.537		
Total	362.620	199			

Predictors: (Constant), inventory management practices, strategic supplier partnership, information technology

b. Dependent Variable: Supply Chain Performance

The F value is 120.140 and is significant because the significance level is = .000 which is less than $P \leq 0.05$. This implies that over all regression model is statistically significant, valid and fit. The valid regression model implies that all independent variables are explaining that there is a positive and significant relationship with dependent variable.

Table 2 Model Summary

Model	R	R Square	Adjusted R square	std. Error of the Estimate
1	.843 ^a	.711	.705	.73264

Predictors: (Constant), inventory management practices, strategic supplier partnership, information technology

Regression coefficient „R“ = .843 or 84.3% relationship exist between (I.V“s) and (D.V).

The coefficient of determination ,R²“ = 0.711 which show that 71.1% of variation in supply chain performance is explained by inventory management practices, strategic supplier partnership, information technology.

Table 3Tableinventory management practices, strategic supplier partnership, information technology and supply chain performance

Model	Coefficient		Beta	t	sig.
	Unstandardized coefficient	Standardized coefficient			
	B	Std Error			
1 (Constant)	-.162	.301		-.877	.387
inventory management	.615	.059	.530	10.494	.000
Strategic Supplier partnership	.174	.049	.156	3.568	.000
Information Technology	.149	.048	.133	3.095	.001

a. Dependent Variable: Supply Chain Performance

The above table the regression coefficient for customer orientation on the supply chain performance (β_1) = .530 which implies that one percent increase in inventory management increases 62.0 percent in supply chain performance level if other variables are kept controlled. The T value is 10.494which is significant at .000 because significance level is less than $P \leq .05$. It implies that the alternate hypothesis should be accepted that is: Inventory management has significant positive on supply chain performance.

The study shows that the regression coefficient (β_2) = .156 or 15.2 % which implies that one percent increase in strategic supplier partnership brings on the average 15.2% increase in supply chain performance level if other variables are kept controlled. The T value is 3.568 which is significant at .000 level which is less than the $P \leq .05$. It implies that the alternate hypothesis should be accepted that is strategicsupplier partnership has positive significant effect on supply chain performance. It was established that the regression coefficient for information technology on supply chain performance (β_3) = .133 or 13.1 % which means that once percent increase in information technology increase 13.1% on supply chain performanceif other variables are kept constant. The T value is 3.095 which is significant at .001. Therefore the study accepted the

alternative hypothesis that is information sharing has significant positive effect on performance of procurement functions in hospitals. The T value is 1.941 which is significant at .05 level.

4.2 Discussion of Research Findings

The majority of the respondents supported that inventory practices affect supply chain performance of soft drinks manufacturing firms in western Kenya, (Gapenski, 2010), confirms that inventory management is getting more and more attention in today's highly competitive environment. The proponents of Inventory system argue that excess inventory will adversely affect the net cash flows of a firm. On the cost side, most obvious are the costs of holding inventory, which include the capital costs (interest or opportunity) and the physical cost (storage, insurance and spoilage). In recent years, a number of systems have been developed in the field of operations management to deal with excess inventory problem. Management-oriented systems include the Just-In-Time (JIT) and Materials Requirements Planning systems (MRP).

The majority of the respondents supported that strategic supplier partnerships affects supply chain performance of soft drinks manufacturing firms in western Kenya, (Borgatti and Foster, 2003), concurs with the latter indicating that shifts have occurred in the business environments with firms moving from standing alone to working with others as a way of enabling better performance. Moreover, studies that have been in the fields of marketing, supply chain management and international management all reflect the importance of such relationships terming it as economic boosters (Nagurney, 2010) as well as a means of bettering the firm's success and performance (Veludo, Macbeth & Purchsae, 2006). Supply chains are prone to uncertainties due to delayed deliveries, machine breakdowns and machine fluctuations which necessitate increased inventories.

The majority of the respondents supported that information technology affects the supply chain performance of soft drinks manufacturing firms in western Kenya, (Carter and Price (2010) assert that information is the life blood of all organizations. An Inventory manager needs information technology in order to succeed in his work. Computers can assist in stock control in calculating the optimum amount of stock to hold and dispatch in order to satisfy the user requirements. Jessop, (2006) confirms that the Electronic Data Interchange, EDI is a system which enables direct communication between organizations without there being any human intervention. This technology has revolutionized inventory management. EDI is the name given to the transmission and receipt of structured data by the computer systems of trading partners, often without human intervention. With the EDI system linking the buying organization with its suppliers, the replenishment can be triggered at the instant the need arises and the message is transferred from the original destination without further possibility of corruption en route.

V. CONCLUSIONS AND RECOMMENDATIONS

From the research findings, the study concludes that; improved production is one of the effects of inventory practices on supply chain performance of soft drinks manufacturing firms in western Kenya, similarly, the study established that quality service delivery, enhanced demand forecast, enhanced supply chain performance, reduced inventory, reduction in storage and profit improvement are also some of the effects of inventory practices on supply chain performance in an organization. Competitive advantage is one of the effects of strategic supplier partnerships on supply chain performance of soft drinks manufacturing firms in western Kenya, on the other hand, the study found out that improved corporate image, effective procurement performance, enhanced shortening in lead time, waste reduction and enhanced good working relationships are also some of the effects of strategic supplier partnerships on supply chain performance. Efficient supply chain the effects of information technology on supply chain performance of soft drinks manufacturing firms in western Kenya, similarly, the study found out that reduced, inventory cost reduction, enhanced supply chain communication, enhanced stock control and faster delivery of services are also some of the effects of information technology on supply chain performance.

The study sought to help key players in the manufacturing industry realize significance of the interplay between the variables as shown in the findings of the study. Therefore, this study recommends review of the order management, in the inventory management in the manufacturing sector to ensure that timely planning is done to ensure timely acquisition. The study recommends that the industrial sector should take a grip of inventory management methods so that they can gain from the enormous benefits accrued from application. Further, there is need to monitor the process of supplier relationship with suppliers to ensure products are delivered on time as well as training of supply chain staff to improve their competency to enable professional management of inventories.

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