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INFLUENCE OF INVENTORY MANAGEMENT SYSTEMS ON PERFORMANCE OF SOFT DRINKS MANUFACTURING FIRMS IN KENYA

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ABSTRACT

There has been a question for management about the efficiency of inventory management procedures in place resulting from inconsistencies of inventory levels leading to various weaknesses like losses that come as a result of over, under-stocking, expiry inventory, failure to meet targets and low morale of the company members. As a result, the company's stores are overcrowded making the work of a store-keeper difficult, late issue of materials to the department and these in turn result into poor inventory service delivery. This study examined the influence of inventory management systems being the independent variable on the performance of soft drinks manufacturing firms being the dependent variable. The specific objectives of the study assessed the influence of Material Requirement Planning in firm's performance, determine the influence of Just in Time on firm's performance, and examine the influence of Vendor Managed inventory on firm's performance and to explore the influence of bar coding on firm's performance. The research used descriptive research design. The target population for the study was 455 employees in the soft drink manufacturing firms in Kenya. The study population was soft drinks manufacturing firms registered by Kenya National Bureau of Statistics (KNBS) 2016 and respondents designated heads of supply chain of these firms. A sample population of 213 was selected by using Slovin's fomula. Questionnaires were administered through both e- mails and hand delivery. Secondary data were obtained from both published and unpublished records. Questionnaires were tested for both reliability and validity. Qualitative and quantitative techniques were used to analyze data with the assistance of SPSS software program version 22. A good response rate of 63% was realized. It was established that most of the inventory management systems indicators have positive impact on performance of the firm. The study further adopted a regression analysis to determine the relationship between the variables at 5% confidence level of significance. The study findings showed that the four variables had a significant influence on performance of the firms.

Key Words: *Material Requirement Planning, Just in Time, Vendor Managed Inventory , Bar Coding , Inventory Management*

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INTRODUCTION

The chapter comprises of the background of the study, statement of the problem, objectives of the study, research questions, significance of the study, limitations of the study and the scope of the study.

Organizations are keen to managing inventory as a step towards minimizing operational costs. In order for an organization to survive and be effective in meeting their market demand, the organization must be cognizant of its supply chain management for better performance and sustained survival (Sandeep, 2007). Inventory management aims at efficient purchasing, storage and use of the materials.

Inventory management practices play a major role in the operation of many businesses and manufacturing companies. In manufacturing, inventories of raw materials allow companies to operate independently of their sources of supplies (Shapiro, 2009). The optimum inventory level lies between the inadequate inventories and the excessive inventories. Competitiveness is a strategy that defines the set of customer needs that it seeks to satisfy through its products and services. Competitive strategy targets one or more customer segments and aims to provide products and services that will satisfy these customers' needs. Inventory management involves ensuring a constant supply of stock to avoid stock out and have uninterrupted sales and efficient customer service, maintaining sufficient stock, controlling investment in inventories by keeping at an optimum level of production while minimizing carrying costs and time (Waters, 2013).

The objective of inventory management is to ensure sufficient level of stock which maintains an acceptable level of available demand while minimizing the related holding, administrative and stock out cost. Several activities are undertaken within the sphere of inventory management, these include purchasing, classification, inspection, codification, store keeping and stock taking which include stock control (Watson, 2010).

Managing inventory is a delicate task that requires a proper knowledge of the matter in order to effectively and efficiently responds to customers' expectations. For Sari (2010), customer service requirements command the structures of the supply chain, including manufacturing, marketing and logistics and to understand how such requirements are a step to meet customer satisfaction. According to available studies in America, inventory contributes sixty percent (60%) of the annual turnover in manufacturing firms (Anderson, 1987). This clearly shows that a lot of concern should be given to inventory management to avoid unnecessary costs. Being a key function in any manufacturing firm accounting for over half of its receipts, it certainly deserves a great deal of managerial attention. In other words, organizations earn or loose large sums depending on how effective their inventory is managed (Ramakrishma, 2005).

Different firms have noticeable implemented materials management that has been vertically integrated with the procurement department. For instance, Toyota Company in Japan, which has an established global market, has been able to conquer new customer segments due to their products offering. They have been able to meet customer's demands for personalization (Banjoko, 2000). They deliver the right product for the specific use as outlined by customers at the right time. This has been possible due to proper specification of materials, which is one of achievement meet through proper inventory management (Chase *et al.,* 2009). Strategic alliance with suppliers has been one of the strategies that have been put in place so as to ensure that they deliver products required as per specs required and assuring quality of products is delivered (Cooper, 1990).

According to Ondiek, (2010), inventory plays a big part in manufacturing firms as it accounts for about 57% of the annual turnover. Kenyan firms are faced with a lot of competition in the market. This has led to the companies coming up with strategies of managing and evaluating how resources are utilized

by various jobs or products to eliminate any wastage in the value chain (Norah, 2017). The major concern is how inventory functions are organized and who is responsible over this function in the Kenyan manufacturing firms. An increased emphasis has been on competitiveness and competitive advantages through effective utilization of organizational resources. Firms have tried to achieve these through, competitive buying, buying wisely, effective and reliable sources of supply, keeping inventory investment and inventory costs at practical minimum (Nyabwaga, 2012).

Statement of the problem

Inventory management systems are critical to an organizations success in today's competitive and dynamic market, Dimitrios (2008). 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 (Rajeev 2010). According to vision 2030, the manufacturing sector should account for 20% of GDP by 2030. However, this has not been achieved with the sector's contribution stagnating at an average of 10% for more than ten years with a growth of 3.1% percent which is lower than the overall countries economic growth of 5% (WB 2015). According to KNBS (2012) poor performance in manufacturing firms in Kenya led to decline in GDP to 4.4 percent in 2011 from 5.8 percent in the year 2010. According to Amoro (2011), most manufacturing firms in Kenya face problems of stock outs, over supply, over stocking, stock obsolescence, poor forecasting, stock pilferage, poor responsiveness to customer needs and lack of proper ICT application systems resulting into poor performance. According to Ross, (2010) many firms in manufacturing sector in Dar es salaam complained of additional inventory management costs that resulted into decline in profit margins.

Several studies have been done to show the relationship between inventory management and organizational performance. Faith (2016) found out that embracing inventory management systems led to improved performance at Sameer Africa. Anichebe et al (2013) Effects of Inventory Management on Organizational Effectiveness in selected organizations in Enugu, was carried out, to assess the impact of proper inventory management on organizational performances in the Nigeria Bottling Company all in Enugu State. The Findings indicate that there is a significant relationship between good inventory management and organizational effectiveness and organizational productivity. Edewin *et. al* (2015) conducted a research on the effect of inventory management on profitability of cement manufacturing companies in Kenya: case of Bamburi cement company where the findings showed that proper streamlined inventory management systems had a positive impact on the profitability in the company. Wilfred (2014) carried out a study on the effect of the effective system of inventory management on organization performance in the seven-up bottling company in Nigeria where he came up with the conclusion that organizations benefits from inventory control management by way of easy storage and retrieval of material, improved sales effectiveness, and reduced operational cost. This study was undertaken to fill the knowledge gap by assessing the effects of inventory management techniques on performance of soft drinks manufacturing firms in Kenya.

Objectives of the Study

The overall objective of the study was to determine the influence of inventory management systems on performance of soft drinks manufacturing firms in Kenya. The specific objectives were:-

- To assess the influence of Material Requirement Planning on performance of soft drinks manufacturing firms in Kenya
- To determine the influence of Just In Time on performance of soft drinks manufacturing firms in Kenya.
- To examine the influence of Vendor Managed Inventory on performance of soft drink manufacturing firms in Kenya.

- To explore the influence of Bar coding on performance of soft drinks manufacturing firms in Kenya

LITERATURE REVIEW

Theoretical Review

Theory of Constraints

The theory of constraints (TOC) had been widely known as a management philosophy coined by Goldratt, (Cyplik, Hadaś, & Domański, 2009) that aimed to initiate and implement breakthrough improvement through focusing on a constraint that prevented a system from achieving a higher level of performance. The TOC paradigm essentially stated that every firm should have at least one constraint (Simatupang, Wright, & Sridharan, 2004). As pointed by Simatupang, *et al.* (2004), collaborating firms shared responsibilities and benefits with their upstream and downstream partners in order to create competitive advantage.

Lean Theory

This theory relates to the influence of Just In Time on performance of soft drinks manufacturing firms in Nairobi. The theory was first developed in Japan in the 1970's. Its goal is to maintain just enough material in just the right place at just the right time to make the right amount of a product (Lewin, 2012).

The theory eliminates buffer stock and minimizes waste in production process (Green & Inman 2005). Firms that are leaner than the industry average generally have positive returns to leanness (Eroglu & Hofer, 2011). This theory explains how manufacturing firms gain flexibility in their ordering decisions, reduce inventory held on site and eliminate inventory carrying costs. According to Williams, (2010) companies that successfully optimize inventory through lean supply chain practices are able to achieve high level of asset utilization and customer satisfaction leading to improved growth, profitability and market share. In this system, the supplier has the responsibility of delivering the components and parts to the production line "Just in Time" for production. For this to work quality of supplied raw materials must be very high because defective materials could halt operations in production given that there are no buffer stocks. However, there is a lot of criticism against the theory due to the assumption that it can only be applicable where there is a close and long term collaboration and information sharing between a firm and its suppliers. The theory is relevant to the study because it brings out the relationship between proper inventory management and performance. It indicates that manufacturers can have flexible ordering processes through sharing of information with suppliers. The theory indicates better inventory practices are a precursor to better performance.

Stock Diffusion Theory

Stock diffusion theory outlines a dynamic approach to inventory management used for non-stationary items with non-constant means and variance. According to stock diffusion theory, stock consumption is modeled as a Markov process with a slow diffusion term. Fokker Planck equation is used to derive the probability distribution of stock consumption and reorder time. Management of the inventory distributed in this manner makes it possible to keep safety stock at minimum levels (Braglia, 2013). Similarly, it ensures the inventory costs are kept at minimal levels without interrupting the internal operations of the organization (Eaton, 1999).

Technology Diffusion Theory

Rogers' Diffusion of Innovation Theory tries to explain how adoption was made to new ideas as well as to innovations by suggesting in the theory, five innovation attributes through which adoption is effected, which are: observability, compatibility, trial ability, relative advantage and complexity (Rogers, 1995). An attribute is said to have a relative advantage when the new innovations is seen to be better than the previous idea that it is replacing. Rogers' theory emphasizes that it is

easier to implement innovations that show an improved advantage over that which was there before, making it easier to adopt. Greenhalgh et al, (2004) adds that users would not adopt innovations that they did not see any relative advantage in them. The ability of an innovation to be easily adopted is that it has to be compatible with a previous idea, meet their experience in the past and fulfill existing values, meaning that there is a higher chance for an innovation to be adopted if it is more compatible.

Inventory Management

According to Kotler (2000), inventory management refers to all the activities involved in developing and managing the inventory levels of raw materials, semi-finished materials (work-in-progress) and finished good so that adequate supplies are available and the costs of over or under stocks are low. Inventories are essential for keeping the production wheels moving, keep the market going and the distribution system intact. They serve as lubrication and spring for the production and distribution systems of organizations. Inventories make possible the smooth and efficient operation of manufacturing organizations by decoupling individual segments of the total operation Wood, (2004). Purchased parts inventory permits activities of the purchasing and supply department personnel to be planned, controlled and concluded somewhat independently of shop-product operations.

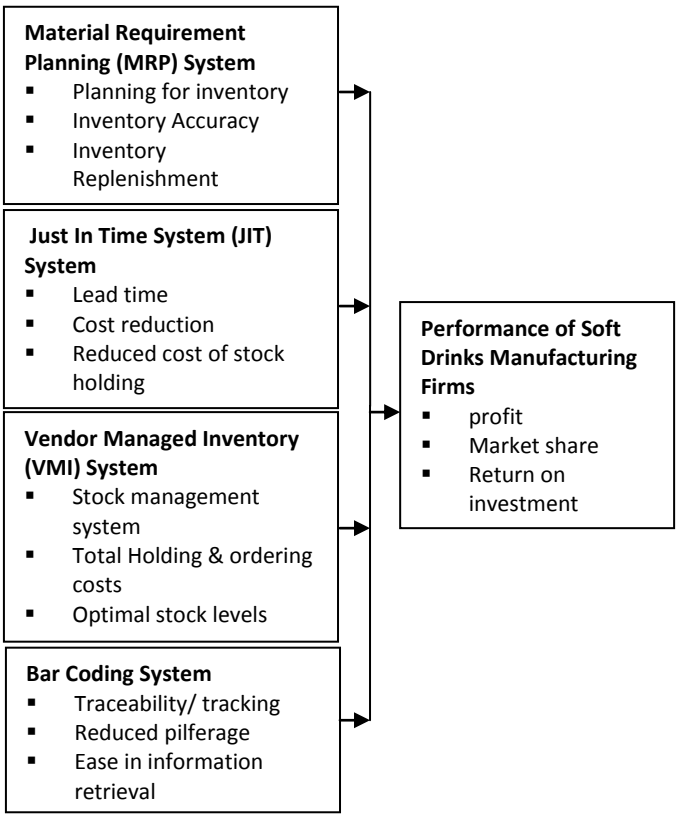
These inventories allow additional flexibility for suppliers in planning, producing and delivering an order for a given product's part, loner gan (2003).

Inventory is essential to organization for production activities, maintenance of plant and machinery as well as other operational requirements. This results in tying up of money or capital which could have been used more productively. The management of an organization becomes very concerned if inventory stocks are high. Inventory is part of the company assets and is always reflected in the company's balance sheet.

Performance of soft drinks manufacturing firms

The performance of an organization is evaluated by how it reduces cost or increases value. Firms' performance monitoring is important; in many industries, the supply chain represents roughly 75 percent of the operating budget expense (Palevich, 1999). Three common measures of performance are used when evaluating performance: efficiency, responsiveness and effectiveness (Chase et al., 2001). Efficiency implies minimization of total system wide costs from transportation and distribution to inventories of raw materials, work in process and finished goods.

Conceptual Framework



Independent variables **Dependent Variable**

Figure 1: Conceptual Framework

Source: Author (2018)

Empirical Review

Inventory is defined as a stock or store of goods (Stock and Lambert, 2001). These goods are maintained on hand at or near a business's location so that the firm may meet demand and fulfill its reason for existence. If the firm is a retail

establishment, a customer may look elsewhere to have his or her needs satisfied if the firm does not have the required item in stock when the customer arrives. If the firm is a manufacturer, it must maintain some inventory of raw materials and work-in-process in order to keep the factory running. In addition, it must maintain some supply of finished goods in order to meet demand.

Inventory management is a branch of management that deals with management of fixed and current assets. Also, it entails the management of daily operational supplies and in our case, agricultural inputs and outputs. Inventory is also a critical asset in any organization though according to Barnes (2008) inventory is looked at as a liability under the just-in-time (JIT) control system. He agrees with the way accountants treat inventory as an asset to the organization. In the statement of financial position, inventory appears under the current assets of the organization regardless whether it's for profit or not for profit organization. Inventory plays a major role and its management goes a long way in helping a firm to grow as it relates to its external customers as well as the internal customers (Gibson, 2013).

Therefore, inventory is essential in the operation of NGOs in the agricultural sector since they may hold inventory as finished goods, work in progress or raw materials for further processing (Fellows and Rottger (2009) and Shapiro (2009)). Shapiro, (2009) also advises that inventory plays a vital role when it comes to demand planning and as a result, the organization needs to be versatile in its management of its inventory when it comes to periodic or seasonal inventories. According to Miller (2010), inventory management involves all activities put in place to ensure that customer have the needed product or service. It coordinates the purchasing, manufacturing and distribution functions to meet the marketing needs and organizational needs of availing the product to the customers. Inventory management is primarily involved with specifying the size and placement of stocked goods. Inventory management is required at different locations within a facility or within multiple locations of a supply network to protect the regular and planned course of production against the random disturbance of running out of materials. The scope of inventory management also involves managing the replenishment lead time, replenishment of goods, returns and defective goods and demand forecasting, carrying costs of inventory, asset management, physical inventory, available physical space, demand forecasting, inventory valuation, inventory visibility, future inventory price forecasting and quality management. With a balanced of these requirements, it is possible to reach an optimal inventory level, which is an on-going process as the business needs shift and react to the wider environment, Ogbo et al, (2014). Inventory management entails planning, organizing, controlling and directing. All these coordinated efforts are meant to ensure achievement of efficiency in all operations of the firm.

Such operations may include procurement, stocking and transportation (Akindipe, 2014). Mismanagement of Inventories may lead to significant financial problems for a firm (Muhayimana, 2015). Inventory management is of high importance in financial management decision. This is because excess or shortage of this may bring danger to the company (Duru, Oleka & Okpe, 2014). The objective of inventory management is to maintain a system that minimizes total cost, while specifically, it establishes that the amount of stock to be ordered is optimal as well as the period between orders (Anene, 2014). Excess inventory consumes a lot of space, can increase possibility of spoilage, leads to a financial burden and loss while insufficient inventory has the potential of interrupting business operations (Swaleh & Were, 2014).

Inventory management is vital and needed in various areas within the firm especially in a supply network so as to protect production against any disturbance of running out of production inputs or materials and goods (Ogbo, Onekanma & Ukpere, 2014). Management of Inventory is crucial to a firm

since it plays a decisive role to enhance efficiency and improve the firm's competitiveness ability against the firm's competitors. Effective inventory management ia all about holding the right amount of inventory required by the business at any point in time (Swaleh & Were, 2014). Inventory management involve creation of a purchasing plan which will help to ensure that all items or materials are available when needed as well as and tracking the existing inventories and its use (Muhayimana, 2015).

Material requirements planning is standard system for calculating the quantities of components, sub-assemblies and materials required to carry out a production programme for complex products (Rushton, Phil, & Baker, 2011). The MRP process starts with a production programme which schedules the products to be completed week by week during the planning period. It is based on customer orders, sales forecasts and manufacturing policy (Farrington &Lysons, 2006).Material requirements planning systems help manufacturers determine precisely when and how much material to purchase andprocess based upon a time-phased analysis of sales orders, production orders, current inventory and forecasts (Farrington &Lysons, 2006). They ensure that firms will always have sufficient inventory to meet production demands, but not more than necessary at any given time. The inventory control technique may be critical to maintaining an appropriate stock level of all products to avoid shortages or oversupply. This may have the effect of ensuring supply reliability of the business firm. Su &Zhong (2009), argue that consistent product availability stimulates consumer demand. According to Kotler& Keller (2006)inventories are a significant portion of the current assets of any business. The study was conducted in Europe. They noted that business firms hold inventory to ensure uninterrupted business operations. Inventory needs proper control as it is one of the largest assets of a business. Material requirement planning system uses master production schedule which it explodes into a bill of materials (Jacobs, Berry,Whybark, & and Vollmann, 2011). Allowing for stock and orders due in, a net requirement of components required is produced.

Just-in-time (JIT) contributes greatly to the positive performance of an organization thus; inventory management needs to be undertaken with utmost keenness taking into account good procurement practices. A study was undertaken between 1981 and 2000 in the US to analyze inventory management and was found out that organizations that kept too much inventory in their warehouse operated an inefficient supply chain, while those that kept very few inventories in their warehouse were very efficient (Lai and Cheng, 2009). Thus, it was found out that keeping moderate inventory is good and it enables an organization operate minimal expenses of holding costs as well as keep setup cost at bare minimum, eliminate unwanted lead time and produce goods as per customers order. Eventually, this enables an organization achieve total quality control (TQC) as efficientand effective supply chain management are employed within a firm's value chain (Datta, 2007).

Vendor Managed 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 (Frahm, 2003)(VMI)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. As the customer and supplier interact, the communication channel needs to be clear and fast so that they may avoid instances of stock outs. Where the customer anticipates having an abnormal order levels, they should notify the supplier so that they can adjust

their production to cater for the demand. Moreover, we now have Joint Managed Inventory (JMI) which is an advance level of vendor managed inventory (VMI). It seeks to integrate the supplier more firmly into thecustomer's organization by using the point of sale (POS) which allows the supplier to seethe real time data of its customer's inventory (Frahm, 2003).

Fellows and Rother (2005) agree that having inventory in your store has an added advantage for the organization since customers will be satisfied instantly leading to improved performance rating. With inventory in your warehouse, an organization has the advantage of timely delivery and stock out are not experienced. Thus, the energy sector need to ensure that they have adequate stock for their operations and distribution. One way they can achieve this is thorough the "Pareto Analysis" also known as Activity Based Costing 21.

METHODOLOGY

This study used descriptive research design which involves gathering of data that describes events then organizing, tabulating depicting and describing the data. The choice of this research design is influenced by the fact that it enables the researcher to assess the situation in the study area at the time of study. The study population was manufacturing firms while the target population would be soft drinks manufacturing firm's staff. Target population is a universal set of the study of all members of real or hypothetical set of people, events or objects to which investigators wishes to generalize the result (Silverman, 2016). This research used a questionnaire to collect primary data. Qualitative data was analyzed by use of content analysis. Quantitative data was coded then analyzed using Statistical Package for Social Sciences (SPSS) computer software version 22. Statistically, analysis was carried out using the models.

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where:

Y_i is the dependent variable (Performance of soft drinks manufacturing firms);

X is the set of the four independent variables, that is;

X_1- Material Requirement Planning (MRP)

X_2- Just in Time (JIT)

X_3- Vendor Managed Inventory (VMI)

X4- Bar Coding

β_i ($_{i=1,2,3,4}$) are the parameters associated with the corresponding independent variable that are to be estimated (partial regression coefficients)

β_0 is the intercept;

ε is the error variability (error term).

RESULTS

Table 1: Descriptive analysis of material requirement planning

Statements	Mean	Std. Deviation
Planning of inventory influence performance	2.85	1.54
Inventory accuracy influences performance	2.55	1.43
Improved production efficiency influences performance	2.55	1.32
Increased customer satisfaction influences performance	2.02	1.23
Timely delivery schedules influences performance	3.99	1.39
Average	**2.792**	**1.382**

The research sought to determine from the respondents the extent to which they agree the firms implemented the Material requirement system in an effort to improve performance in the soft drinks manufacturing firms. From the research findings, majority of the respondents indicated that

they neither agreed nor disagreed that the firms implemented Material requirement planning based on the average mean of 2.792. Majority of the respondents neither agree nor disagree that the firms focus on planning for inventory as shown by a mean of 2.85; the respondents also had moderate stand that accurate production influence performance as shown by a mean of 2.55; respondents also were in moderate agreement on firm production efficiency influence on the performance of the firm as shown by a mean of 2.55. Majority of the respondents were in moderate agreement that customer satisfaction influence performance as shown by mean of 2.02. Concisely, majority of the respondents agreed timely schedules affects performance as shown by a mean of 3.99. This implies that majority of the firms had started recognizing the role of material requirement planning on enhancing performance with other firms in the soft drinks manufacturing firms. The findings of this study are in tandem with literature review by singer, (2017) who observed that material management techniques that are enhance issues such as using effective purchasing strategies, waste reduction, and budget review and planning of the materials.

Table 2: Just in Time Techniques

Statements	Mean	Std. Deviation
Waste reduction influences performance	3.12	1.32
Reduced inventory holding cost influence performance	2.94	1.3
Increased customer satisfaction influences performance	3.53	1.45
Improved return on investment influence performance	3.81	1.4
Improved supplier relationship influence performance	4.17	1.12
Average	**3.314**	**1.318**

The research sought to determine from the respondents the extent to which they agree the firms implemented the just in time techniques in an effort to improve performance function in the soft drinks manufacturing firms. From the research findings, majority of the respondents indicated that they neither agreed nor disagreed that the firms have effective just in time techniques based on the average mean of 3.31. Majority of the respondents agreed that the firms have implemented waste reduction aspect when as shown by a mean of 3.12; the respondents also had moderate agreement stand that the reduced inventory holding cost influences performance as shown by a mean of 2.94; respondents also were in agreement that increased customer satisfaction influences performance as shown by a mean of 3.53. Majority of the respondents were in agreement that improved return on investments affects performance shown by mean of 3.81 and the respondents were in agreement that improved supplier relationship influences as shown by mean of 4.17.

This implied that majority of the firms had started recognizing the role of just in time techniques on performance with other soft drinks firms in the manufacturing sector. The findings of this study are in tandem with literature review by Tozay, (2012) who observed that inventory management techniques enhance issues such as using effective reduction in inventory costs, effectives management of material and enhancement of performance.

Table 3: Vendor managed inventory

Statements	Mean	Std. Deviation
Reduced operating cost influence performance	3.77	0.181
Optimal stock levels influence performance	3.70	0.139
Reduced lead-time influence performance	3.58	0.189
Increased profitability influences performance	3.18	0.175

Strengthened vendor relationships influence performance	3.64	0.162
Average	**3.57**	**0.138**

The research sought to determine from the respondents the extent to which they agree the organization implemented the Vendor managed inventory to boost their performances. From the research findings in majority of the respondents neither nor disagreed agreed that the firm has strategies on reducing operation costs enhances performance, as shown by average mean 3.77. Respondents agreed that organization focus on the optimal stock level as shown by average 3.70. The respondents agreed that reduced lead time influence performance as shown a mean of 3.58. The respondents agreed that increased profitability affects performance of the organization as shown by mean of 3.18. The respondents agreed that strengthen vendor relationships influence performance through enhancement of quality as shown by a mean of 3.64. This implies that majority of the firms have started recognizing the role of inventory management techniques in enhancing performance with other firms in the soft drinks manufacturing firms. The findings of the study are in agreement with literature review by Waithaka (2012), who indicated that effective supplier management approach improve productivity and performances of a firm.

Table 4: Descriptive analysis of Barcoding system

Statements	Mean	Std. Deviation
Improved operations affect performance	3.30	1.28
Inventory accuracy influences performance	3.62	1.27
Ease traceability influences performance	4.07	0.95
Ease decision making influence performance	3.50	1.54
Incentives to suppliers influence performance	3.53	1.45
Average	**3.622**	**1.26**

The research requested the respondents to indicate the extent to which they agree the firms has implemented the barcoding systems in an effort to enhance their performances in the soft drinks manufacturing firms. From the results, majority indicated that they neither agreed nor disagreed that the firm had improved operations to enhance performance shown by a mean of 3.30. The respondents agreed that inventory accuracy if effective in enhancing performance as shown by a mean of 3.62. The respondents agreed that ease traceability of the inventory documents enhances performance as shown by a mean of 4.07. The respondents agreed that decision making affects performance as shown by a mean of 3.50. The respondents agreed that the ease information retrieval affects performance as shown by 3.53. The above findings corroborate with literature review by Sandeep (2007) who indicated that inventory management systems are achievable through; vendor involvement and sensitization of suppliers. According to Eyaa & Oluka (2011), the inventory accuracy is another important aspect of enhancing performance of firms.

Performance of the soft drinks manufacturing firms

The research requested the respondents to indicate the extent to which they agree firms implemented the inventory management techniques enhance their performances in their firms. From the research findings, majority of the respondents neither agreed that; the firm's implementation of inventory management techniques positively affects the performance, as such all the variables have effects on the performance of the firm as an important element in its inventory management. The firms incorporated inventory management techniques also have positive impact on the cost budget, quality and timely delivery as shown in the figure above

Inferential Analysis

The study used Pearson correlation analysis to establish the association among the variables used in the study. A Pearson correlation was used since the data was discrete. Correlation indicates the direction in one variables if another variables changes. A negative Pearson correlation value indicates negative correlations while a positive Pearson correlation value indicates a positive correlation. The strength of the association increases as the value approaches either negative or positive. Correlation findings indicated that the correlation between inventory management systems and performance at manufacturing firms was 0.493 with a corresponding p value of 0.000. The correlation coefficient was therefore significant and positive implying that if Material requirement planning increases the performance at soft drinks manufacturing firm also increases. The findings concurred with Karimi Namusonge (2014) findings who also revealed that technical capability, financial strength and competitive level affected performance in the manufacturing sector. The results further revealed that the correlation between just in time techniques and performance at 0.575 with a corresponding p value of 0.000. The correlation coefficient was also significant and positive which implied that if increase in just in time techniques increases the performance of soft drinks manufacturing firm. This finding conforms to those of palmer (2013) who found out that there is a strong relationship between approval rating of inventory controls and performance of a firm.

The findings also indicated that the correlation between Vendor managed inventory and performance of soft drinks manufacturing firm was 0.679 with a corresponding p value of 0.000. The correlation coefficient revealed a significant and positive association implying that if vendor managed inventory increase the performance of the soft drinks manufacturing firms also increases singer (2017) also emphasizes that the scope of vendor managed inventory is determining whether the operational inventory approach and structural inventory approach.

The finding results indicated that the correlation between barcoding systems and performance of soft drinks manufacturing firms was 0.576 with a corresponding p value of 0.000. The correlation coefficient revealed a significant and positive association implying that increase in barcoding systems increases the performance of soft drinks manufacturing firms. According to Preuss (2011) systems enhanced effective inventory audits are very crucial in enhancing the performance of vendors in the organization.

Table 5: Correlation Matrix

		Material requirement planning	Just in Time techniques	Vendor managed inventory	Barcoding Systems
Material requirement planning	Pearson correlation	1			
Just in Time techniques	Sig Pearson correlation	.538** 0.000	1		
Vendor managed inventory	Sig Pearson correlation	.535** 0.003	.613** 0.000		
Barcoding Systems	Sig Pearson correlation	.154** 0.014	.373** 0.000	.477** 0.001	
Performance	Sig Pearson correlation	.493** 0.000	.575** 0.000	.679** 0.000	.576** 0.000

Multivariate Regression Analysis

In order to establish the statistical significance of the hypothesized relationships, multiple linear regression was conducted at 95 percent confidence (α=0.05). The result revealed a relationship R=0.640, indicating a strong positive association between material requirement planning, just in time techniques, vendor managed inventory, barcoding systems and performance. R^2 =0.41 indicate that 41.7% of variation in the performance can be explained by the four variables.

Table 6: Multivariate Regression Analysis

Model	R	R^2	`Adjusted R^2	Std. error of the estimate
1	0.640[a]	0.41	0.401	0.54908

The result of ANOVA test showed that the F value was 43.602 with a significance of p value =0.000 which was less than 0.05, meaning that there is a significant relationship between material requirement planning, just in time techniques, vendor managed inventory, barcoding systems and performance of a firm. The ANOVA statistics at 5% level of significance shows that the value of F calculates (F computed) is 43.602 and the value of F critical (F tabulated) at 4 degrees of freedom and 83 degrees of freedom at 5% level of significance is 2.44. F calculated (F computed) is greater than the critical (F tabulated) (43.602>2.44), this showed that the overall model was statistically significant at 5% significance level.

Table 7: Analyze of various (ANOVA) results (overall model significance).

Model		Sum of squares	Df	Mean square	F	Sig
1.	Regression	52.583	4	13.146	43.602	.000[b]
	Residual	75.674	129	0.301		
	Total	128.257	134			

a. dependent variable: performance

b. Predictors: (constant), material requirement planning, just in time techniques, Vendor managed inventory, barcoding systems.

The coefficient of material requirement planning was (β=0.196, p=0.000, <0.05) showed a statistically significant relationship between material requirement planning and performance. The results implied that a unit increase in material requirement planning would result to an increase of 0.196 units in performance. Similarly, Vorster (2013) study concluded that technical capability affected performance of an organization. It was therefore recommended that the implementation of material requirement planning systems indicators have impact on the performance of a firm.

The coefficient of Just in time techniques was (β=0.260, p=0.000, <0.05) showed a statistically significant relationship between just in time techniques and performance. The results implied that unit increase in just in time techniques would results to an increase of 0.260 units in performance. This finding conforms to those of Weele (2010) who found out that there is a strong relationship between just in time techniques and performance, therefore the study conclude that the presence of a just in time techniques positively affects performance in organization.

The coefficient value of Vendor managed inventory was ((β=0.217 p=0.000, <0.05) this showed statistically significant relationship between vendor managed inventory and performance function of a firm. The results are tandem with the research done by Schmalensee (2013) who found out that vendor managed inventory is effective in utilization of

operational activities in the organization increases the performance of the firms.

The coefficient of barcoding systems was (β=0.198, p=0.000, <0.05) showed a statistically significant relationship between barcoding systems and performance. The results implied that a unit increase in barcoding systems would results to an increase of 0.198 units in performance of the firm Tozay (2012) also emphasized that the extent of bar coding implementation is to determine the audit process as represented by management, is adequate and functioning in a manner which ensures that the inputs are appropriately identified and managed.

Table 8: Regression coefficient Results

	B	Std error	T	Sig.
(constant)	2.331	0.173	13.473	0.000
Material requirement planning	0.196	0.042	4.666	0.000
Just in time techniques	0.260	0.065	4.000	0.000
Vendor managed inventory	0.217	0.052	4.173	0.000
Barcoding systems	0.198	0.061	3.245	0.000

a) Dependent Variable: performance function

$Y= \beta_0+ \beta_1X_1+\beta_2X_2+ \beta_3X_3+ \beta_4X_4+ \varepsilon$

$Y=2.331+0.260X_1+0.217X_2+0.198X_3+0.196X_4+ \varepsilon$

Y= performance

B_0= Constant

X_1= Material requirement planning

X_2= Just in time techniques

X_3= Vendor managed inventory

X_4= Barcoding systems

ε = Performance

CONCLUSIONS

The study found that material requirement planning had impact on the soft drinks manufacturing firm performance. The extent of user involvement and consultation in development of specification, value analysis, review and management of specification amendment improves the performance of the firm. This was because specifications provide basis for purchase orders therefore they provide most important elements of purchasing. Therefore, enhancing suitability and competitiveness of the organization.

The receiving process of materials coming into the firms should be effectively and efficiently controlled through just in time techniques and ensuring that the receiving bay or section is at most proximal location. Materials techniques of handling should be used for handling outlined materials correctly while putting the consideration that extra handling does not add value. Quantity and quality inspection should always be done and ensuring that there was no traffic of materials in the receiving section

The study found that effectiveness of inventory management system such as just in time contributes to ability to maintain optimum stocks. Dependability of demand forecasting, planning for production requirement and reduced lead times also contributes to optimal stock levels which ultimately improves the performance of the firm. This is because of the ability to forecast the demand of raw materials and the consumables while minimizing the inventories held within the firm.

From the study, control of materials coming into a firm affected the performance of procurement function. The proximity of the receiving facility contributed to the effectiveness of the receiving process. Frequency of inspections would result to quality assurance. Through application of materials handling equipment, handling time would be minimized and also the extent of traffic would be minimal thus improving the performance of the firm.

The study found that vendor management systems elements had an impact in delivery were as a result of poor communication with suppliers which resulted to quantity and time cost and also lack of supplier delivery appraisals which lead to quality costs. Many respondents agreed that much time was incurred during inspection and testing of materials. Therefore, the performance of soft drink manufacturing firms was being undermined because of extra costs incurred and thus inability to save on purchases.

The study concluded that Soft drinks manufacturing firms should adopt the barcoding systems of tracking the inventories and tracing its path. These should be done by having a definite automated inventory control system that will improving the production scheduling, makes flexible manufacturing processes and fast and effective recognition of goods in the stores. This would aid in improving firm's performance as much inventory can be traced easily and the location is identified through the codes

RECOMMENDATIONS

In the light of above findings, some pertinent recommendations can be made. These recommendations are geared towards enhancing the effective and efficient supply chain framework with a view to improving the performance of soft drink manufacturing firm.

Soft drinks manufacturing firms should embrace expertise in formulation of documentation at early stages of materials design. User departments should always be involved and consulted in development of material requirement planning. The material planning techniques should always be reviewed to meet requirements for use and purpose. This will improve the performance of firm as it will be able to meet the requirements of users and also reduce disputes among suppliers.

The receiving process of materials coming into the firms should be effectively and efficiently controlled through just in time techniques and ensuring that the receiving bay or section is at most proximal location. Just in time techniques of handling should be used for handling outlined materials correctly while putting the consideration that extra handling does not add value. Quantity and quality inspection should always be done and ensuring that there is no traffic of materials in the receiving section. These activities enhance the performance of the firm as they ensure the right quality is received, extra costs are not incurred and production is not delayed.

Soft drink manufacturing firms should practice long-term relationship with suppliers and develop strategies to develop them so that they can be able to deliver the quality required without errors and defects. Reliable communication practices should be adopted among the suppliers and the buying organization so as to curb costs from quantity and product deviations. Firms should outsource logistical services from expertise firms so as to minimize damages and delays in materials in transport. These activities improve the performance of the firm as they reduce or prevent costs from deviations in delivery.

Soft drinks manufacturing firms should adopt the barcoding systems of tracking the inventories and tracing its path. These should be done by having a definite automated inventory control system that will improving the production scheduling, makes flexible manufacturing processes and fast and effective recognition of goods in the stores. This will aid in improving firm's performance as much inventory can be traced easily and the location is identified through the codes.

Areas for Further Research

The objective of the study was to assess the influence of inventory management systems on performance of manufacturing firms Kenya. It recommended that a similar research should be conducted with other variables or of other firms in other sectors, including the service industry in the Kenyan market. A review of literature indicated that there has been limited amount of research on the

same topic. Thus, the findings of this study serve as a basis for future studies on inventory management systems. The inventory management systems and performance of manufacturing firms, has not been widely studied which presents gaps in African and Kenyan contexts. The study has contributed to knowledge by establishing that material requirement planning, just in time techniques and vendor managed inventory and barcoding systems influence performance of manufacturing firms in Kenya. Apparently, Future research may be designed to compare the findings in this study with findings that relate to firms in other regions in Kenya and other countries. Concisely, the findings showed that 41.0 % of the performance is explained by the four variables that is material requirement planning, just in time techniques, vendor management techniques and barcoding and the remaining 59% can be accounted by the standard error.

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