INVENTORY MANAGEMENT PRACTICES AND SUPPLY CHAIN PERFORMANCE OF FAST MOVING CONSUMER GOODS MANUFACTURERS IN NAIROBI

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DECLARATION

This research project is my original work and has not been submitted for a degree in this or any other University.

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DEDICATION

This project is dedicated to my beloved husband Crispino Auko Mc’Omondi and my daughters Kayla Auko and Kelsey Auko who gave me invaluable moral support throughout the period.
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ABBREVIATIONS AND ACRONYMS

FMCG  Fast Moving Consumer Goods
SCOR  Supply Chain Operation Reference
BSC   Balanced Score Card
KETEPA Kenya Tea Parkers
GDP   Gross Domestic Product
JIT   Just in Time
TQC   Total Quality Control
VMI   Vendor Managed Inventory
JMI   Joint Managed Inventory
POS   Point of Sale
ROL   Re Order Level
EOQ   Economic Order Quantity
ROP   Re Order Point
ERP   Enterprise Resource Planning
MRP   Material Requirement Planning
KAM   Kenya Association of Manufacturers
ABSTRACT

The business dynamism environment is characterized by intense competition, diminishing resources and internationalization among other factors. As a result, many manufacturing firms are forced to produce products at lower costs. Most manufacturing companies are adopting inventory control techniques which minimize operational costs hence maximizing profits. An inventory management practice improves efficiency on the supply chain and hence it plays an important role among manufacturing firms. In manufacturing firms, too much stock could lead to tied capital, increase in holding cost, theft and deterioration of materials. In addition, materials’ shortage in manufacturing firms can lead to production process interruption, underutilization of machines and poor customers relations. This study therefore sought to identify inventory management practices implemented by FMCG manufacturers in Nairobi; and to determine the effect of inventory management practices on supply chain performance of FMCG manufacturers in Nairobi. The study used descriptive research design and the target population was 51 FMCG manufacturers in Nairobi. Primary data was collected by use of a structured questionnaires. The research instrument generated quantitative data, which was analyzed by use of descriptive statistics and inferential statistics. Descriptive statistics included measures of central tendency (mean), frequencies, percentages and measures of dispersion (standard deviation). On the other hand, inferential statistics included correlation analysis and multiple regression analysis. To identify the inventory management practices used by FMCG manufacturing firms, the study used descriptive statistics. In determining the effect of inventory management practices, the study used correlation analysis and regression analysis. The results of the study were presented by use of both graphs and tables. The study found that FMCG manufacturing firms in Nairobi County were using inventory management practices such as just in time, vendor managed inventory, reorder level, economic order quantity, enterprise resource planning and material requirement planning. The study also found that inventory management practices (just in time, vendor managed inventory, reorder level, economic order quantity and enterprise resource planning) have a positive effect on supply chain performance measures, which include inventory holding cost, stock out, obsolescence as well as ordering cost. This study recommends that all FMCG should increase their JIT technique adoption so as to reduce wastes (time, finances, space and labor) in the production process. The study also recommends that all manufacturing firms should adopt Vender managed inventory systems so as to automatic stock tracking. The study further recommends that should set their reorder levels, so as to ensure that the stock is replenished whenever it goes below the set levels.
CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

The business dynamism environment is characterized by intense competition, diminishing resources and internationalization among other factors, many manufacturing firms are forced to produce products at lower costs. Most manufacturing companies are adopting inventory control techniques which minimize operational costs hence maximizing profits (Sharma & Arya, 2016). Inventory management practices improve efficiency on the supply chain and hence it plays an important role among manufacturing firms. In manufacturing firms, too much stock could lead to tied capital, increase in holding cost, and deterioration of materials, obsolescence and theft. In addition, materials’ shortage in manufacturing firms can lead to production process interruption, underutilization of machines and poor customers relations. Among manufacturing firms, inventory plays a major role in the production process and hence its management helps a firm to grow and increase on its profitability and customer base (Gibson, 2013). To ensure there is no stock out, which may dissatisfy customer needs, proper inventory control and supply chain must be ensured which goes hand in hand to ensuring manufacturing does stop due to stock outs.

The study will be anchored on two main theories to explain the relationship between inventory management practices and supply chain performance. These theories include theory of constraints and lean production theory. The theory of constraints on supply chain explains that firms have at least one financial or none financial limitations, which hinder the achievement of one or more of their goals. Prasad and Tata, (2010) indicates that the theory of constraint puts emphasis on managing the capacity and capability of the constraints if the competitiveness of the organization is to be improved and this can be achieved by applying inventory management practices. Lean production theory, on the other hand, seeks to eliminate overstocking and minimize waste in the process of production (Palevich, 2012). Lean production theory expounds on how manufacturing organization gains flexibility in their ordering decisions, stock reduction held on site and elimination of other costs like carrying costs.

The fast moving consumer goods (FMCG) manufacturing firms in Nairobi are considered to be active and fast organizations in the production of a range of items. These organizations are mostly concerned with fast moving products like home care products, refreshments, personal
care and foods. Most of these products are supposed to be consumed within a short duration of time and some of the have a short-shelf life. Therefore, an efficient supply chain is of necessity and inventory control is of paramount importance in these organizations.

1.1.1 Inventory Management Practices

Inventory management practices refers to the regulation, control and maximization of inventory in an organization. Silver (2007) defines inventory management practices as the supervision and coordination of activities involving supply, storage, distribution, and recording of inventory in an organization in an effort to maintain adequate quantities to meet the current needs of the customers without having a loss of excessive supply. Inventory control techniques are crucial, and knowledge in them is highly desirable therefore, procurement staff and managers should be able to apply them in order to improve the supply performance of their organization.

Proper warehousing of inventory so that when items are ordered, they are kept at the warehouse for the least time possible, minimizing holding cost of inventory, is necessary (Sandeep, 2007). Consequently, other operational costs may increase inventory management costs. The way an organization is able to maintain its costs at low levels the better. Inventory is bought and sold by organizations, balances always arise at the end of the year and it is therefore necessary to carry them over to the following year. After the organization has realized this, an online inventory management tool is developed that is used to monitor information about inventory through breaking it down by correlating the categories with its customers. Because the operations of organizations are different in different fields, inventory can therefore be classified either by seasons or economic year end of the customers who are most significant. Therefore, it is important to employ demand forecasting in order to have an efficient supply chain.

However, it is important to note that the most important aspect in an organization is managing supply chain thus it is important for a firm to bring on board employees with professional qualification and technical background of inventory management practices which include: total quality management, just-in-time, Lean production, Re-order levels and use of enterprise resource planning. Due to factors like globalization and technology, there is need for organizations to align themselves competitively so as to enhance supply chain performance with efficiency and effectiveness (Shapiro, 2009).
1.1.2 Supply Chain Performance

Organizations are constantly seeking to improve performance in their supply chain in order to stay afloat in business and stay clear from extensive competition from their competitors. Organizations are judged on performance according to their achievements over the years as noted by Porter (1980). It is important to note that supply chain performance is accessed in different levels of management. The hierarchies in function are the strategic, operational and tactical levels wherein trade-offs and policies can be differentiated and control that is suitable is exerted. A hierarchy is founded on horizon of time for activities and the pertinence of decisions to effect different management levels. Supply chain performance measures and metrics depend on supply chain processes/activities, which include source, plan, delivery/customer and assemble/make.

As the business arena takes a paradigm shift, we are now seeing improvements in supply chain performance where firms are focusing on the overall firm’s supply chain performance other than individual company supply chain performance. Competition has necessitated organizations to improve on their service delivery, customer satisfaction, and demand forecasting and ensuring that response time is efficient (Shapiro, 2009). Manufacturing company’s performance measures are depicted by their outputs and more so on achievement of their goal which is production of merchandise for end users.

Measurements of supply chain performance are used in order to find out the effectiveness and efficiency of current systems being used or benchmark competing options, Beamon (1998). They offer the essential response data to make known about developments, improve inspiration and communication and identify complications (Chan, Qi et al. 2003). Determining it aids a better knowhow of the supply chain, positively effects routine, and advance general performance (Shepherd and Gunter 2006). Performance measures of supply chain performance for each firm are done very contrarily and it is subjected to specific firm (Kleijnen & Smits, 2003). The Supply Chain Operations Reference (SCOR model), benchmarking and Balanced scorecard are three approaches that are used for Supply Chain performance measurements within the industry. The SCOR model lets managers to address, advance and lead into supply chain management operations within and amongst all shareholders. It is centered on a range of different management practices which comprises of planning, sourcing, make decisions, deliver and
return. Rolf (2007). The balanced scorecard (BSC) recommended by Kaplan and Norton (1996) may offer an all-inclusive measurement system for supply chains by incorporating four diverse perceptions while measuring performance, viz, customer, financial, internal business process and learning and innovation. The balanced scorecard covers both non-financial and financial measures (Brewer & Speh, 2000). It also guides management reports to concentrate on measures that are aimed at representing organizations strategy (Kaplan, 2005).

1.1.3 Fast Moving Consumer Goods Manufacturers in Nairobi

Faster growth has been experienced in Kenya’s FMCG in few decades ago. Majumdar (2004) came up with term (Fast Moving Consumer Goods) in order to represent goods that are sold at lower price but moves quickly to consumers. Such goods have high demand and they don’t stay longer in retailers’ shelves. This has led to many manufacturers both local and international enter in to that industrial sector to have their market share (Wasamba, 2008) some of the manufacturer’s include Kapa Oil Refineries, Coca-Cola, Super Loaf bakers, and many others (Katuse & Njambi, 2013). These products are not only sold in local markets but are exported to other countries. Brierley (2002) argues that FMCG are not food products but also include other stuffs like electronics, pharmacy products, beverages like beer, Cigarettes just to mention but a few only that their category is done differently.

There are manufacturers who have a bigger portion of market share in the oil sector of FMCG than others and in this case Bidco Kenya commands a lead of 24% of the share. The second one is Kapa oil refineries with a portion of 12% while Unilever having a portion of 9%. (Euromonitor, 2015). Wesonga (2015) argues that there is high competition in Kenya due to factors like improved technology it has made it difficult for some of best performing manufacturers in Kenya.

FMCG manufactures are very much essential to our Kenyan economy. Kenya Association of manufacturers report (2017) indicates that manufacturing sector with estimated 3700 manufacturers as at (2010) contributed 10.5% of Gross domestic Production (GDP) in year 2015. The report further highlights that in manufacturing sector, food products leads in with a share of 43%, beverages and tobacco had a share of 8%, printing and media share was 4%, chemical share was 7%, basic pharmaceuticals was 1%. The rest included other segments of
manufacturing. From the report, it can be analyzed that about 60% of manufactured products are categorized as FMCG. A sizeable number of this manufacturing firm are located in Nairobi. The overall output was Ksh1.9trillion (Kenya Association of manufacturers Report, pg. 16, 2017). It also indicated that manufacturing sector had employed 295, 400 people as 2015.

Fast Moving Consumer Goods range from different categories depending with their needs. A report by Kenya Association of Manufacturers (2017) indicates that food Stuff commodities fall under category of basic needs. An example of this goods includes things like maize and wheat flour, milk, bread, cooking oil, Rice etc. The other category includes stuffs like Tissue paper, lotions, beauty products, etc. This range of FMCGs belongs to the category of secondary needs which people can do without. The other category includes leisure products which includes beverages beer, cigarettes, wine and so on. They are not necessities to human beings life but their consumptions is as a result of habits from human behavior.

**1.2 Research Problem**

Organizations that practice proper inventory management practices and thoroughly use them, rarely collapse compared to those that do not. Therefore, inventory management practices are applied by FMCG manufacturing companies and utilize them so as to achieve efficiency in supply chain. Just-in-time, Material requirement planning, stock levels and Vendor managed inventory are some of the control methods used in managing stock of which employees who lacks skills and competencies in them will hinder success of supply chain performance.

Manufacturing in Kenya and particularly in Nairobi is one of the largest GDP contributors which stands at 10.5% and from within manufacturing sector, Food and other stuffs contributed to over 50% of manufactured products as at 2015, Kenya Association of manufacturers report (2017). As noted earlier, Janet (2006) argued that FMCG are not only food products stuffs but also include other products like electronics, pharmacy products, and beverages like beer, Cigarettes and many others. However, these manufacturing firms have to ensure that they remain relevant in the market by adopting management practices which promotes growth strategy of their firms. Inventory management practices and supply chain performances cannot be wished away by any FMCG manufacturer who want to maintain his market share and conquer more.
Bai and Zhong (2008) found out that inventory management is critical for majority firms nevertheless are particularly essential for small businesses due to their insufficient resources. Suitable inventory management improves the firm’s reasonable power and success owing to minimalized costs, and customer gratification. This study was not conducted on large manufacturing companies and doesn’t show the relationship between inventory management practices and the FMCG manufacturers in Nairobi. Anichebe and Agu (2013) in their study established that the managerial efficiency can be enhanced by proper inventory management if there is sufficient inventory for manufacture, customer gratification and high profitability of the firm. Nevertheless, the research was not based on how inventory management practices affects the supply chain performance of FMCG manufacturers. Etim, John and Ime (2014) established that inventory management practices can improve the operational performance of a firm through proficiency in resources utility, enhanced service level, and decrease in lead time and that companies that adopts inventory management practices are capable of handling material unavailability, produce stock outs, and component pile up. But this study did not research on how inventory management practices impacts on performance of Supply chain in FMCG manufacturers.

Locally, a study conducted by Wacuka, (2015) seeking to establish relationship between inventory management control and supply chain performance did nothing on inventory management practices and supply chain performance of FMCG manufacturers. The study conclusion was that majority of petroleum industries in Nairobi use inventory management techniques. An assessment of the inventory management and chain performance of non-governmental organizations in the agricultural sector in Kenya by (Gakinya, 2012) established that most of non-governmental have embraced inventory management techniques. Wambui (2015) did an assessment on lean management practices and supply chain performance of FMCG firms in Kenya. The findings revealed that lean management impacts directly on overall performance of FMCG firms.

From the research studies above, it is clear that no study was found that has been conducted on inventory management practices and supply chain performance of FMCG manufacturers in Nairobi. Therefore, this study endeavored to fill this knowledge gap by answering the questions: what is the impact of inventory management practices on supply chain performance of FMCG
manufacturers in Nairobi? Which inventory management practices are implemented by FMCG manufacturers in Nairobi? What is the effect of inventory management practices on supply chain performance of FMCG manufacturers in Nairobi?

1.3 General Objective of the Study
The general objective of the study was to find out the Impact of inventory management practices on supply chain performance of FMCG manufacturers in Nairobi

1.3.1 Specific Objectives

i) To identify inventory management practices implemented by FMCG manufacturers in Nairobi.

ii) To determine the effect of inventory management practices on supply chain performance of FMCG manufacturers in Nairobi.

1.4 Value of the Study

The findings of the research study may be useful to manufacturing sector in Kenya, particularly FMCG manufacturers, since they may be in a position to pinpoint weaknesses and areas which needs to be improved in their organization in regard to inventory control so as to improve supply chain performance. The supply chain managers and finance managers in FMCG manufacturing firms may also use the findings of this study to develop strategies on inventory control in an effort to improve supply chain performance.

Manufacturing firms, including Fast Moving Consumer Goods manufacturers, play a major role in the Kenyan economy. Therefore, the performance of these firms may also influence the performance of the national economy. As such, to the government of Kenya and policy makers, the findings of this study can be used to formulate policies to improve inventory control among manufacturing firms and hence improve supply chain performance.

The study also adds more information to the body of knowledge on inventory control techniques and supply chain performance in the FMCG manufactures in Kenya. To academicians and other researchers, the study acts as a point of reference for future studies in the supply chain field especially on the concept of techniques used in inventory control.
2.1 Introduction

The areas discussed in this chapter include theoretical literature review, inventory management practices, supply chain performance and empirical review. The researcher also provided research gaps identified and a conceptual framework to show the relationship between the dependent and independent variables.

2.2 Theoretical Literature Review

Theories that support inventory control have been used to explain the effects of inventory control techniques on performance of supply chain in FMCG manufactures in Nairobi. Theories used in the study include theory of constraints and lean production theory.

2.2.1 Lean Production Theory

This theory has its focus on the management of the production flow through the steps that add value to the final product. Lean production is a contrast of mass production whose focus is on returns maximization from the initial investment in machinery and setup initial overhead. Lean production theory eliminates buffer stock and minimizes waste in the process of production, (Palevich, 2012). Profitability of an organization is positively affected by leanness of the inventory hence making it one of the best ways of inventory control. Schonberger (2008) posits that organizations with leaner production processes as compared to the industry’s average generally obtain the benefits of the leanness.

Lean production theory expounds on how manufacturing organization gains flexibility in their ordering decisions, stock reduction held on site and eliminating other costs like carrying costs. Studies have shown that organizations have successfully optimized inventory through lean supply chains practices to yield to highly utilize assets and satisfy customer which has led to greater market share, improved profitability and growth. However, the theory has been criticized that it can only be applicable when two organizations have entered into long term collaboration and sharing of information between those two trading partners (Ryfman, 2007).
2.2.2 Theory of constraints

This is a philosophical theory that seeks to increase throughput efficiency in manufacturing or performance of systems that are measured by sales by identifying the processes that constrain the system of manufacturing. Prasad and Tata, (2010) indicates that the theory of constraint is founded on the principle that a chain is only as strong as the weakest link or constraint and to elevate and manage the constraint as necessary. The challenges of this theory are: long lead time, many unfulfilled orders, or the they are executed extra effort (extra time), inventory levels that are high that are unnecessary, large emergency orders and expedition level, lack of key customer engagement etc. these are some of bottleneck that manufacturing companies normally face to warrant inventory control techniques application in their operations so as to meet projected demand of their products.

Therefore, this theory puts emphasis on managing the capacity and capability of the constraints if the competitiveness of the organization is to be improved and this can be achieved by applying inventory control practices that are appropriate. Many organizations strive to invest in organizational and technological structures that are required to achieve up to date current systems synchronization which enable inventory flow coordination (Shapiro, 2009).

2.3 Inventory Management Practices

In business operations, Lambert (2008) indicates that inventory management practices is essential for the organization since organizations success and cost minimization of the expenditures of a firm leads to improvement in the performance of supply chain and employee knowledge. These inventory management practices are crucial and the knowledge in them is highly desirable therefore managers and procurement staff should apply the techniques so as to benefit the organization (Fellows & Rottger, 2005).

Proper warehousing of inventory is recommended by (Wild, 2002) so that when goods items are ordered, they are kept at the warehouse for the shortest time possible so as to reduce cost of holding inventory. Consequently, other operational cause inventory control costs go up. The way an organization is able to maintain its costs at low levels the better it is for the annual profits (Palevich, 2012). As organizations buy and sell their inventory, balances arise at the end of the year. These balances should be carried over to the next year as balances carried forward thus are
the opening balances for the following year. On realizing this, an online inventory management tool can be developed so as to monitor the information on inventory breaking it down into groups by correlating the categories with its customers. Classification of inventory can either be by seasons or economic year end of the customers who are most significant because manufacturing companies operate differently thus demand forecast should be employed so as to have a supply chain that is efficient (Poiger, 2010).

2.3.1 Just-In-Time

This is a management philosophy and it is not a technique. Just in time entails producing goods so as to meet the demands of the customer in time and at the right quality and quantity. This is not dependent on whether the customer is the final purchaser of the product or there exist another process in the production line. It also entails producing within the minimum time. The components of waste are time, materials and resources. Just in time defines how work should be done. It is further concerned with creation of the right environment for operations to be effective (Porter, 1980). Just-in-time (JIT) contributes greatly to the positive supply chain performance of an organization thus; inventory control needs to be undertaken with utmost keenness taking into account good procurement practices.

A study was carried out between 1981 and 2000 in the US so as to do an analysis of inventory management. The findings were that a lot of inventory had been kept in the organization’s warehouse thus operating a supply chain that was inefficient while those organizations with fewer inventories were more efficient (Sandeep, 2007). Thus, it was found out that moderating on the inventory stored was good as it assisted the organization in operating expenses that were minimal such as holding cost and set up costs, assisted in elimination of unwanted lead time as well as producing goods as per the orders of the customers. Eventually, organizations are in apposition to achieve total quality control (TQC) since supply chain management efficiency nd effectiveness are employed within the value chain of the firm

2.3.2 Vendor Managed Inventory

Vendor Managed Inventory (VMI) are essential to the supplier as they assist in monitoring inventory used by the customers. The system helps customers to reduce stock outs as suppliers will have their stocks replenished. Communication is an essential aspect and should planned well
from the start of the business relations between the client and the supplier. Moreover, there is now (Sandeep, 2007). Joint Managed Inventory (JMI) and this is vendor managed inventory (VMI) advanced level. JMI integrates the supplier more firmly to the organization of the customer through the use of point of sale (POS) that allows a supplier to see the real time data of the inventory of the customer. VMI is therefore a management tool in inventory and supply chain where the supplier takes the responsibility on the timing and amount of replenishment inventory. It is called for continuous process replenishment, continual replenishment and replenishment that is automatic.

To the downstream member, VMI is essential in that a larger retailer have been well documented. Prasad and Tata, (2010) indicated the key VMI advantages included cost reduction as well as customer service increase to both of the participating members. VMI reduced the carrying cost of inventory as well as reducing the stock problems. In addition, VMI enables the synchronization of both transportation and inventory decisions. The advantages of VMI included customer service improvement, demand uncertainty reduction, inventory requirement reduction as well as reduced cost on a case study at Johnson and Johnson.

2.3.3 Re-Order Level (ROL)

As firms endeavor to accomplish effectiveness, ought to improve its understanding of ROL. This is because it facilitates the ascertainment of the time of making orders, depending on the reorder levels. The ascertainment of when to make orders can be achieved by utilizing quantitative methods that require appropriate management of stock (Apte, 2010). ROL is crucial in the manufacturing industry as it leads to optimum effectiveness and improves efficiency, which in turn leads to an improvement in consumer gratification and supply chain performance. According to Beamon and Kotleba (2006), manufacturing firms should have a nominal reorder level and an alternative reorder level.

2.3.4 Economic Order Quantity

Stock management requisite to be structured in a reasonable manner in order for the company to be able to tell what time to make an order and how much will be require to be ordered (Bachetti et al., 2010). The determination of when to make an order and how much will be required can be done by utilizing the computation of Economic Order Quantity (EOQ). EOQ enables a company
to develop a plan on stock replacement on an appropriate time base, which can be on quarterly basis, yearly basis, half yearly basis or monthly basis. If a firm does that, it is capable of having minimal costs or zero cost of storage within their warehouses because incoming stock is going out immediately. Therefore, this is almost similar to just in time concept of supply chain management embraced by Toyota Motor Corporation in Japan which aids in having zero holding costs, (Schonberger, 2008).

Consequently, as firms attempt to improve on their stock management, Re-order Point (ROP) and Economic Order Quantity (EOQ) are considered to be the most important tools that can be used in the process of ensuring there is no stock out in a firm (Gonzalez & Gonzalez, 2010). Over the years, manufacturing firms have been sustaining their inventory through guess work, which significantly influences the operations of a firm and the production process. As a result, many manufacturing firms have experienced stock outs, which leads to the dissatisfaction of customers. Therefore, manufacturing firms have been changing their approaches by adopting practices such as re-order point and economic order quantity.

2.3.5 Enterprise Resource Planning

Enterprise resource planning (ERP) system is a one of the components of an organizations integrated supply chain management system that integrates all the stakeholders in a supply chain (Lambert, 2011). An enterprise resources planning package can be defined as a database that allows a company to gather data for use in other applications. This database, combined with development and extraction equipment, ensures effective sharing of information in an organization, which helps in the improvement of decision making processes as stakeholders in a supply chain can easily share information. In addition, the use of ERP minimizes the cost of communication in a supply chain, which subsequently leads to supply chain performance (Song & Zipkin, 2011).

2.3.6 Material requirements planning

This is an information system that is computer based and is used in production scheduling and purchase of demand items that are dependent. Information used include demands of the end product, structure of the product and component requirements, purchase and production lead
times as well as levels of current inventory so as to develop the schedules of lost effective purchase and production. This system assumes that the end product is comprised of hierarchies of assemblies, subassemblies and raw materials components. An end product requirement schedule is based on demand forecast or actual orders of the customer (Martinich, 1997).

Ballou (2004) indicate MRP primarily is useful in making schedules for high volume custom made materials, parts and supplies whose demand is known well. From the logistics view point, MRP is useful in avoiding carrying of these inventory items. A new product is stocked in a field warehouse and is controlled using a reorder point inventory control procedure. The result of this policy is to send intermittent replenishment orders to the inventories at the plant. Due to the intermittent depletions of the inventory component, inventory levels that are high must be maintained when they are not required. Where the rate of depletion of the level of inventory can be anticipated roughly, ordering of the components can be done before the depletion with a result substantial saving in inventory carrying costs.

2.4 Supply Chain Performance

The performance of a supply chain refers to the extent of linkage between different firms in a supply chain, which starts with the suppliers of raw materials, followed by manufacturers, distributors and finishes with the customers (Olhager et al, 2002). It is an incorporated procedure measure of proficiency, which comprises of raw materials manufactured into finished goods, and then distributed to clients via an organized delivery channels comprising of four main groups, which are supplier, manufacturer, distribution and consumers (Beamon, 1999).

In her research on Downstream Supply Chain Performance on Petroleum Companies in Kenya, Livoh (2011) established that though there is certainly no a common technique of determining supply chains performance, various scholars have come up with pioneering methods whereas others have researched current ways of measurement. Various companies look to constantly progress their processes to improve main competitiveness y us of supply chain measurement. Khisa (2011) also proposed that such supply system wants to be improved by coming up with metrics and a valuation of carrying out to overcome obstacles in applying the present measurement system.
Nevertheless, several firms have not be successful in taking full advantage of their supply chain‘s capabilities since they frequently unsuccessful fail to advance performance measures and metrics required to totally incorporate their supply chains to capitalize on efficiency and proficiency. Gunasekaran,(2004). Measurement of supply chain performance is significant in the whole chain's capability to fulfil end-customer desires through manufactured goods availability and reactive, on-time distribution (Baghwat&Sharma, 2007)

2.4.1 Stock Out

A stock out happens at any time raw materials as well as other supplies are needed in the production process but they cannot be supplied as they are not in stock. According to George (2008), stock outs among manufacturing firms leads to lost sales and backorders. The costs of backorders mainly encompass, additional organization administration cost, late suppliers’ penalties, price discounts, expediting transportation and material handling and the potential profit interest held up in the backorder. On the other hand, the cost of lost sales include probable profit loss if part or the whole order is canceled as well as penalties relate to failure to deliver as agreed. In addition, lost sales costs and backorders can also lead to loss of customers’ goodwill in the long run.

Therefore, if stock outs are not properly managed, it may land a manufacturing firm into serious trouble. Anderson et al. (2006) find out that a stock out of a single component of an order leads to an increase in probability that a customer may decide to cancel the whole order. This is due to the complementary nature of most of the products manufactured by a single manufacturing firm and fixed costs associated with that order and the shipping cost. Campo et al. (2003) conducted a study on retail stock outs impact on what to buy, whether to buy and how much to buy. This study utilized scanner panel data collected in large retail chains in Europe. The results indicated that stock outs lead to a reduction in purchase incidence probability, purchasing of smaller quantities as well as induction of asymmetric choice shifts. Therefore, the reason why manufacturing firms adopts inventory management practices like re order level, Just in Time techniques practice and vendor managed inventory so as to replenish stock immediately it runs out.
2.4.2 Inventory Holding Costs

Inventory holding costs refers to the costs related with storage of inventory which has not been sold. This encompasses total inventory costs, ordering costs as well as shortage costs of a single element. Inventory holding costs in a firm encompasses spoilt or damaged goods cost, labor costs, insurance costs and storage costs (Durlinger, 2012).

Durlinger (2012) notes that one of the most significant approaches in the minimization of stock expenditures and holding costs is the establishment of reorder points, which signals the supply chain department of an organization to order more inventory from the suppliers. A precise and well established reorder point helps a manufacturing firm to fulfil their customer’s orders without recklessly spending on stock. Organizations making use of reorder points circumvent scarcity related costs, which most of the times leads to losing of clients, due to cancelation of orders. Reorder levels in a manufacturing firm reflect the duration of time it will take to receive raw materials from suppliers as well as monthly and weekly product sales level. A reorder level also helps in the calculation of EOQ, which is the required amount of stock (raw materials) that a firm should order from suppliers.

2.4.3 Obsolesce Inventory

Obsolete inventory is a word that defines stock inventory that emanates from product lifecycle culmination. Fritsch (2014) indicates that once a product reaches the culmination stage of a product life cycle, the market demand reduces to almost zero. A product life cycle is basically determined depending on a specified period of time that there are no sales for a particular product. Firms with no projections of their stock replenishments appropriate time, are often left with large obsolete inventory amounts in their warehouses. Obsolete stock refers to inventory in the balance sheet of a company that is tied up as working capital, but with slight possibilities of a return on investment. Minimizing inventory costs is an important aspect in manufacturing firms.

Fritsch (2014) further argues that a number of firms need not to make the mistake of not discharging obsolete inventory immediately. Certain firms will keep the obsolete stock to evade presenting a huge write off or expenditure on the quarterly report. The obsolete stock investment, ought to have yielded revenue and profit ut all of a sudden turn out to be a cost and expense to the firm. This is a major drawback to companies especially FMCG. Measures of Inventory
management need to be taken and may include inventory management practices like JIT and VMI.

2.5 Empirical Literature Review

Chukwuma (2016) conducted a study to establish the effect of inventory management practices on selected manufacturing firms’ productivity. The study also assess the effect of demand management and customer satisfaction among selected manufacturing firms. Through the use of descriptive research design established that inventory control has a significant effect on selected manufacturing firms’ performance. It was therefore recommended that manufacturing firms should come up with policy frameworks to facilitate the inventory management practices’ implementation. Agu (2013) carried out a study on influence of inventory management on organizational performance. Descriptive research method was used and the findings were the studied organizations applied inventory management which enhanced their production. It further recommended that organizations should diversify inventory systems to suit specific needs.

A research was conducted by Waithaka’ (2015) to analyze inventory management systems and supply chain performance in public hospital in Nairobi Kenya. Descriptive study method was employed targeting population in the eight public hospitals in Nairobi. Data was generated using questionnaire, oral interviews, observations, books, journals and the internet. From the data analyzed, it was established that inventory management systems and level of integration impacts on supply chain performance within the public hospital in Nairobi Kenya. It further concluded that inventory management systems are key in influencing supply chain performance. The Research made four recommendations whereby the first one was that the public hospitals should ensure that a proper inventory management system is implemented. The second was that public hospitals should ensure integration of different inventory management systems in inventory management to control the cost involved. The third was current supply chain integration practices need to be reviewed and designed to fit the evolving dynamic market environments. The last recommendation was that all stakeholders in inventory management should be involved in the management of inventory processes. However the researcher faced some challenges which include busy working hours thus limiting questionnaire response rate and fear of some staff could compromise confidential information.
Another study done by Kamakia (2015) titled “inventory management and supply chain performance of petroleum marketing firms in Nairobi” used descriptive design and employed both primary and secondary data collection methods. The research findings were that the surveyed petroleum firms in Nairobi use inventory management technique and it was an indication that they Improve supply chain performance in their firms. The study recommended that petroleum marketing firms should develop a policy framework to facilitate faster implementation of the best management practices. It also suggested that petroleum marketing should start making investments in modern technology, through the implementation of EDI, which plays a major role in the reduction of inventory costs and in the improvement of returns.

Ngumi (2015) research study focused on the effect of inventory management practices on large manufacturing firms’ productivity. The research adopted descriptive survey research design. Stratified research design as described by Cooper and Scheduler (2006) was applied to come up with the sample size which included 50 large manufacturing companies. The study used primary data that was collected using self-administered questionnaire. The study concluded that inventory management practices have a significant effect on large manufacturing firms’ productivity. The study recommended that control measures should be taken on stock as it the case of cash by large manufacturing firms because stock represents cash and a substantial share of funds is invested in the firm’s inventory.
2.6 Summary of Empirical Literature Review

### Table 2.1 Summary of Empirical Literature and Knowledge gap

<table>
<thead>
<tr>
<th>Author</th>
<th>The Study</th>
<th>Method and Sample</th>
<th>Key variables</th>
<th>Key findings and Predictions</th>
<th>Key contributions</th>
<th>Research Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chukwuma et al (2016)</td>
<td>Effects of Inventory management on organizational performance</td>
<td>Descriptive survey design</td>
<td>Inventory management and organizational performance</td>
<td>Inventory management effects of selected manufacturing firms</td>
<td>Inventory management is essential in every business management</td>
<td>The research concentrated on entire organization</td>
</tr>
<tr>
<td>Agu (2013)</td>
<td>Effects of inventory managements on organizational effectiveness of selected key states</td>
<td>Descriptive research method</td>
<td>Inventory managements and organizational effectiveness</td>
<td>Studied organizations applied inventory control management</td>
<td>Enhanced production</td>
<td>Didn’t explain the nature of organizations studied</td>
</tr>
<tr>
<td>Wagura (2015)</td>
<td>Inventory management systems and supply chain performance in public hospital in Nairobi Kenya”</td>
<td>Descriptive design</td>
<td>Inventory Management and supply chain performance</td>
<td>Inventory management systems and level of integration impacts on supply chain performance within the public hospital in Nairobi Kenya.</td>
<td>inventory management systems are key in influencing supply chain performance</td>
<td>The study was limited to hospitals only.</td>
</tr>
<tr>
<td>Kamakia (2015)</td>
<td>Inventory management and supply chain</td>
<td>Descriptive</td>
<td>Inventory Management and Petroleum firms in Nairobi use inventory</td>
<td>It indicated that they Improve</td>
<td>Studied petroleum were relatively small and other</td>
<td></td>
</tr>
<tr>
<td>Performance of petroleum marketing firms in Nairobi</td>
<td>Research</td>
<td>Supply chain performance</td>
<td>Management technique</td>
<td>Supply chain performance in their firms</td>
<td>Petroleum marketing firms and stakeholders were not involved</td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>----------</td>
<td>--------------------------</td>
<td>----------------------</td>
<td>----------------------------------------</td>
<td>----------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Ngumi (2015)</td>
<td>Inventory management practices effects on the productivity of large manufacturing firms in Nairobi.</td>
<td>Descriptive Research Design</td>
<td>Inventory managements and productivity</td>
<td>Control measures should be taken on stock as it the case of cash by large manufacturing firms because stock represents cash and a substantial share of funds is invested in the firm’s inventory</td>
<td>Companies are employing professionals</td>
<td>Response rate was poor</td>
</tr>
</tbody>
</table>
2.7 Conceptual Framework

A conceptual framework can be referred to as a set that has ideas and principals that are broad and are taken from fields that are relevant and are used in the structuring a subsequent presentation, it shows the association between the variables that influence inventory management practices and supply chain performance.

This research study endeavored to ascertain how each inventory management practice affect the performance of supply chain. Supply chain Performance metrics included variables like stock outs, inventory holding costs and obsolescence. The independent variables included inventory management practices such as just-in-time, vendor managed inventory, re-order level, economic order quantity, enterprise resource planning and material requirement planning. Supply chain performance not only depends on inventory management practices, but there are other organizational factors. These factors include size of manufacturing organization, organizational culture, location and environment and technology.

Figure 2.1: Conceptual Model

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Dependent Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inventory Management Practices</strong></td>
<td><strong>Supply Chain Performance</strong></td>
</tr>
<tr>
<td>• Just-In-Time</td>
<td>• Stock Outs</td>
</tr>
<tr>
<td>• Vendor Managed Inventory</td>
<td>• Inventory Holding Costs</td>
</tr>
<tr>
<td>• Re-Order Level</td>
<td>• Obsolescence</td>
</tr>
<tr>
<td>• Economic Order quantity</td>
<td>• Ordering cost</td>
</tr>
<tr>
<td>• Enterprise resource planning</td>
<td></td>
</tr>
<tr>
<td>• Material Requirements planning</td>
<td></td>
</tr>
</tbody>
</table>

Source: Researcher (2017)
CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter discussed the research methodology which was used in carrying out the study. It described the research design, target population, sampling design, data collection.

3.2 Research Design

This study utilized a descriptive research design. According to Bryman and Cramer (2012), a descriptive survey design is good in the assessment of trends and opinions and the use of a survey is an effective and efficient way of collecting data that can help a researcher in addressing research questions. Descriptive research design is therefore one of the best methods used in carrying out a research in human context as it portrays the current facts through collection of data used in testing hypothesis or to answer questions thus concluding the study. By using inferential and descriptive statistics, descriptive research design was considered to be design in achieving this study’s objectives.

3.3 Population of the Study

The population of the study comprised the FMCG manufacturers in Nairobi and they are 51 in number (see AppendixII). Given the relatively small number a census approach is proposed.

3.4 Data Collection

This study used primary data, which was collected by use of a structured questionnaire. A structured questionnaire generated quantitative data, which was in form of categorical data (nominal and ordinal data) (Kothari, 2004). In addition, the closed ended questions provide precise information that minimizes information bias and facilitate data analysis. The suitable respondents are the supply chain managers, operations managers and warehouse managers or their equivalent. The target is to collect data from 51 respondents that is one respondent per organisation from each of the 51 firms (See Appendix II).The questionnaires was divided into sections A to C. Section A gathered data on demographic information of respondents, Section B and C contained questions on the types of inventory management practices implemented by the FMCG manufacturers and the influence of inventory management practices on measures of
supply chain performance. The questionnaires were then distributed to the managers using a “drop and pick” later method and by mail to enhance response rate.

3.6 Data Analysis

The research instrument generated quantitative data, which was analyzed by use of inferential and descriptive statistics. Descriptive statistics included measures of central tendency (mean), frequencies, percentages and measures of dispersion (standard deviation). On the other hand, inferential statistics included correlation analysis and multiple regression analysis. To identify the inventory management practices used by FMCG manufacturing firms, the study used descriptive statistics. In determining the effect of inventory management practices, the study used correlation analysis and regression analysis. The outcomes of the study were further presented by use of both graphs and tables.

The following regression model was used to show impact of inventory control on supply chain performance:

\[ Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + e \]

Where;
- \( Y \) = Supply chain performance in FMCG manufacturing firms
- \( \beta_0 \) = Y intercept that is the value of Y when X is equal to zero;
- \( \beta_1, \beta_2, \beta_3, \beta_4, \beta_5 \) and \( \beta_6 \) are regression weights coefficients attached to the variables;
- \( X_1 \) = Just In Time,
- \( X_2 \) = Vendor Managed Inventory,
- \( X_3 \) = Re-order Level
- \( X_4 \) = Economic Order Quantity
- \( X_5 \) = Enterprise resource planning
- \( X_6 \) = Material Requirement Planning
- \( e \) = Error Term.
CHAPTER FOUR
DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction
This chapter covers the presentation, interpretation and discussion of the findings. The purpose of this study was to determine impact of inventory management practices on supply chain performance of FMCG manufacturers in Nairobi. The objectives of the study were to identify inventory management practices implemented by FMCG manufacturers in Nairobi and to determine the effect of inventory management practices on supply chain performance of FMCG manufacturers in Nairobi.

4.2 Response Rate
The target population of this study was all 51 FMCG firms. Out of 51 managers respondents who included the supply chain managers, operations managers and warehouse managers or their equivalent, 47 responses were obtained. This gives a response rate of 92%. The study did not achieve a 100 per cent response rate because some of the questionnaires were not fully filled and others had some inconsistent information. However, Kothari (2004) indicates that a 50% and above response rate is adequate for analysis and making inferences.

4.3 General Information
The general information comprised of the managers’ gender, age bracket, work experience, position in the organization, highest level of education as well as category of FMCG manufactured by the firm.

4.3.1 Gender of the Respondents
The managers were asked to indicate their gender and the results were as presented in Table 4.1.
Table 4.1: Gender of the respondents

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>33</td>
<td>70.2</td>
</tr>
<tr>
<td>Female</td>
<td>14</td>
<td>29.8</td>
</tr>
<tr>
<td>Total</td>
<td>47</td>
<td>100.0</td>
</tr>
</tbody>
</table>

As indicated in table 4.1, 70.2% of the managers indicated that they were male while 29.8% indicated that they were female. From the results, most of the managers in FMCG manufacturers in Nairobi County are male meaning they are gender insensitive.

4.3.2 Age of the respondents

The respondents were further asked to indicate their age bracket. The results were as shown in Table 4.2.

Table 4.2: Age of the respondents

<table>
<thead>
<tr>
<th>Years</th>
<th>Frequency</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 25 years</td>
<td>14</td>
<td>29.8</td>
</tr>
<tr>
<td>26-35 years</td>
<td>17</td>
<td>36.2</td>
</tr>
<tr>
<td>26-45 years</td>
<td>7</td>
<td>14.9</td>
</tr>
<tr>
<td>Above 45 years</td>
<td>9</td>
<td>19.1</td>
</tr>
<tr>
<td>Total</td>
<td>47</td>
<td>100.0</td>
</tr>
</tbody>
</table>

From the findings, 36.2% of the managers indicated that they were aged between 25 and 35 years, 29.8% indicated that they were aged below 25 years, and 19.1% reported that they were aged above 45 years while 14.9% reported that they were aged between 36 and 45 years. From the findings, most of the FMCG manufacturers’ managers were aged between 25 years and 35 years.

4.3.3 Respondents’ work experience

The respondents were asked to indicate the period within which they had been working in their organizations. The results were as presented in Table 4.3.
Table 4.3: Respondents work experience

<table>
<thead>
<tr>
<th>Years</th>
<th>Frequency</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 1 year</td>
<td>7</td>
<td>14.9</td>
</tr>
<tr>
<td>1-5 years</td>
<td>23</td>
<td>48.9</td>
</tr>
<tr>
<td>6-10 years</td>
<td>8</td>
<td>17.1</td>
</tr>
<tr>
<td>Above 10 years</td>
<td>9</td>
<td>19.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>47</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

From the findings, 48.9% of the respondents had worked in the organization for between 1 and 5 years, 19.1% had worked for above 10 years, 17.1% had worked for between 6 and 10 years while 14.9% had worked for below 1 year. From the findings, most of the managers in FMVG manufacturers had worked in the organization for between 1 and 5 years.

4.3.4 Respondents’ position in the organization

The managers were also asked to indicate the position they hold in their organizations. The results are as presented in Table 4.4.

Table 4.4: Respondents position in the organization

<table>
<thead>
<tr>
<th>Managers</th>
<th>Frequency</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warehouse Manager</td>
<td>12</td>
<td>25.5</td>
</tr>
<tr>
<td>Operation Manager</td>
<td>13</td>
<td>27.7</td>
</tr>
<tr>
<td>Supply chain manager</td>
<td>22</td>
<td>46.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>47</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

From the findings 46.8% of the managers reported that they were supply chain managers, 27.7% indicated that they were operations managers, while 25.5% indicated that they were warehouse managers. From the findings, most of the respondents were supply chain managers in their manufacturing firms.
4.3.5 Respondent’s Level of education

The managers were further asked to indicate their highest education level. The results were as presented in Table 4.5

Table 4.5: Respondents’ Level of education

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Frequency</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary Certificate</td>
<td>7</td>
<td>14.9</td>
</tr>
<tr>
<td>Diploma</td>
<td>12</td>
<td>25.5</td>
</tr>
<tr>
<td>Undergraduate degree</td>
<td>19</td>
<td>40.4</td>
</tr>
<tr>
<td>Postgraduate Degree</td>
<td>9</td>
<td>19.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>47</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

As shown in Table 4.5, 40.4% of the managers indicated that they had undergraduate degrees, 25.5% indicated that they had diplomas, 19.1% reported that they had postgraduate degrees while 14.9% indicated that they had secondary certificates. From the findings, most of the managers in FMCG manufacturers in Nairobi County had undergraduate degrees.

4.3.6 Category of FMCG’s manufactured by the firm.

The managers were also asked to indicate the category of FMCG products that is manufactured in their organizations. The results were as presented in Table 4.6.

Table 4.6: Category of FMCG’s manufactured by the firm.

<table>
<thead>
<tr>
<th>Products</th>
<th>Frequency</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic products</td>
<td>24</td>
<td>51.1</td>
</tr>
<tr>
<td>Secondary products</td>
<td>12</td>
<td>25.5</td>
</tr>
<tr>
<td>Leisure products</td>
<td>11</td>
<td>23.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>47</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

From the findings, 51.1% of the managers indicated that their firms manufacture basic products, 25.5% indicated that their firms manufacture secondary products while 23.4% reported that their firms manufacture leisure products. From the findings, most of the FMCG’s manufacturing firms manufactured basic products.
4.4 Inventory management practices Used in FMCG Manufacturing Firms

The respondents were asked to indicate the type of inventory management practices used in FMCG manufacturing firms. A Likert scale was used where 1 signified strongly disagree, 2 signified disagree, 3 signified neutral, 4 signified agree and 5 signified strongly agree.

<table>
<thead>
<tr>
<th>Table 4 7: Inventory management practices Used in FMCG Manufacturing Firms</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Just in Time</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FMCG uses JIT stock control system</td>
<td>3.753</td>
<td>.809</td>
</tr>
<tr>
<td>FMCG uses the JIT system to eliminate waste</td>
<td>3.723</td>
<td>1.100</td>
</tr>
<tr>
<td><strong>Vendor managed inventory</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FMCG practices vendor managed inventory systems</td>
<td>3.680</td>
<td>.911</td>
</tr>
<tr>
<td>FMCG collaborates with its suppliers in system upgrade</td>
<td>3.638</td>
<td>.725</td>
</tr>
<tr>
<td>FMCG uses automatic stock tracking</td>
<td>3.574</td>
<td>.978</td>
</tr>
<tr>
<td><strong>Re-order level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FMCG uses re-order level to replenish stock</td>
<td>3.574</td>
<td>.837</td>
</tr>
<tr>
<td><strong>Economic Order Quantity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic Order Quantity FMCG uses to control items according to their stock value</td>
<td>3.212</td>
<td>.667</td>
</tr>
<tr>
<td>FMCG uses Economic Order Quantity to reduce stock holding cost</td>
<td>3.744</td>
<td>1.092</td>
</tr>
<tr>
<td><strong>Enterprise Resource Planning</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FMCG uses Enterprise Resource Planning system</td>
<td>3.744</td>
<td>1.112</td>
</tr>
<tr>
<td>FMCG has an integrated information sharing system</td>
<td>3.851</td>
<td>.908</td>
</tr>
<tr>
<td>FMCG maintains a database for all its suppliers</td>
<td>3.680</td>
<td>1.085</td>
</tr>
<tr>
<td><strong>Material Requirement planning</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FMCG uses Material Requirement planning system</td>
<td>3.808</td>
<td>.924</td>
</tr>
<tr>
<td>FMCG uses material resource planning to purchase demand items</td>
<td>3.531</td>
<td>1.080</td>
</tr>
</tbody>
</table>
In relation to Just in Time as an inventory management practice, the managers agreed with a mean of 3.753 that their FMCG manufacturing firms use Just in Time stock control system. The managers also agreed with a mean of 3.723 that their FMCG manufacturing firms use the JIT systems to eliminate waste.

Regarding the use of vendor managed inventory, the managers agreed with a mean of 3.680 that FMCG manufacturing firms make use of vendor managed inventory system. In addition, they agreed with a mean of 3.638 that FMCG manufacturing firms collaborate with their suppliers in system upgrade. Also, they agreed with a mean of 3.574 that FMCG manufacturing firms use automatic stock tracking. In regard to Re-order level as a inventory management practice, the managers agreed with a mean of 3.574 that FMCG manufacturing firms use re-order level to replenish stock.

The managers agreed with a mean of 3.212 that their FMCG manufacturing firms use Economic Order Quantity to control items according to their stock value. In addition, the managers agreed with the statement that their FMCG manufacturing firms use Economic Order Quantity to reduce stock holding cost as shown by a mean of 3.744.

In relation to enterprise Resource Planning as an inventory management practices, the managers agreed with a mean of 3.851 that FMCG manufacturing firms have an integrated information sharing system. In addition, the managers agreed with a mean of 3.744 that FMCG manufacturing firms use enterprise resource planning system. Also, the managers agreed with a mean of 3.680 that FMCG manufacturing firms maintain a database for all their suppliers.

Regarding, material requirement planning, the managers agreed with a mean of 3.808 that their FMCG manufacturing firms use material requirement planning systems. In addition, the managers agreed with a mean of 3.531 that their FMCG manufacturing firms use material resource planning to purchase demand items.
Table 4.8: Summary of Inventory Management Practices Used in FMCG Manufacturing Firms in Nairobi

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Inventory Management Practices</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Enterprise Resource Planning</td>
<td>3.758</td>
</tr>
<tr>
<td>2.</td>
<td>Just in Time</td>
<td>3.738</td>
</tr>
<tr>
<td>3.</td>
<td>Material Requirement Planning</td>
<td>3.670</td>
</tr>
<tr>
<td>4.</td>
<td>Vendor managed inventory</td>
<td>3.631</td>
</tr>
<tr>
<td>5.</td>
<td>Re-order level</td>
<td>3.574</td>
</tr>
<tr>
<td>6.</td>
<td>Economic Order Quantity</td>
<td>3.478</td>
</tr>
</tbody>
</table>

From the Table 4.8 above, it was revealed that the most popular inventory management practices used in Fast Moving Consumer Goods Manufacturers in Nairobi are as follows: ERP systems (3.758), Just in Time (3.738) and MRP (3.670) while the Vendor Managed Inventory (3.631), Re-order level (3.574) and Economic Order Quantity (3.478) were the least implemented in Fast Moving Consumer Goods Manufacturers in Nairobi.

4.5 Influence of Inventory Management Practices on Supply Chain Performance

The respondents were asked to indicate how the inventory management practices used in FMCG Manufacturing Firms in Nairobi County influence supply chain performance.
Table 4.9: Supply Chain Performance

<table>
<thead>
<tr>
<th>Use of JIT has reduced,</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inventory holding Cost</td>
<td>3.766</td>
<td>.964</td>
</tr>
<tr>
<td>Stock out</td>
<td>3.574</td>
<td>.856</td>
</tr>
<tr>
<td>Obsolescence</td>
<td>3.851</td>
<td>1.022</td>
</tr>
<tr>
<td>Ordering cost</td>
<td>3.153</td>
<td>.776</td>
</tr>
<tr>
<td>Use of Vendor Managed Inventory has reduced</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inventory holding Cost</td>
<td>3.617</td>
<td>1.074</td>
</tr>
<tr>
<td>Stock out</td>
<td>3.723</td>
<td>.993</td>
</tr>
<tr>
<td>Obsolescence</td>
<td>3.638</td>
<td>.971</td>
</tr>
<tr>
<td>Ordering cost</td>
<td>3.338</td>
<td>.811</td>
</tr>
<tr>
<td>Use of Reorder level has reduced</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inventory holding Cost</td>
<td>4.000</td>
<td>1.103</td>
</tr>
<tr>
<td>Stock out</td>
<td>3.808</td>
<td>.969</td>
</tr>
<tr>
<td>Obsolescence</td>
<td>3.276</td>
<td>.715</td>
</tr>
<tr>
<td>Ordering cost</td>
<td>2.110</td>
<td>.613</td>
</tr>
<tr>
<td>Use of Economic order quantity has reduced</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inventory holding cost</td>
<td>3.808</td>
<td>1.035</td>
</tr>
<tr>
<td>Stock out</td>
<td>3.744</td>
<td>.943</td>
</tr>
<tr>
<td>Obsolescence</td>
<td>4.000</td>
<td>.932</td>
</tr>
<tr>
<td>Ordering cost</td>
<td>2.229</td>
<td>.709</td>
</tr>
<tr>
<td>Use of Enterprise Resource Planning has reduced,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inventory holding cost</td>
<td>3.680</td>
<td>.957</td>
</tr>
<tr>
<td>Stock out</td>
<td>3.872</td>
<td>.972</td>
</tr>
<tr>
<td>Obsolescence</td>
<td>3.531</td>
<td>.608</td>
</tr>
<tr>
<td>Ordering cost</td>
<td>3.808</td>
<td>1.015</td>
</tr>
<tr>
<td>Use of Material Requirement Planning has reduced,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inventory holding cost</td>
<td>3.787</td>
<td>.954</td>
</tr>
<tr>
<td>Stock out</td>
<td>4.042</td>
<td>.806</td>
</tr>
<tr>
<td>Obsolescence</td>
<td>3.851</td>
<td>.884</td>
</tr>
<tr>
<td>Ordering cost</td>
<td>3.170</td>
<td>1.028</td>
</tr>
</tbody>
</table>

From the findings, the managers agreed that the use of JIT has reduced, obsolescence (M=3.851), inventory holding cost (M=3.766) and stock out (M=3.574). However, the managers were neutral on the statement that the use of JIT has reduced ordering cost in their FMCG manufacturing firms (M=3.153).

The managers also agreed that the use of vendor managed inventory has reduced stock out, obsolescence and inventory holding cost as shown by means of 3.723, 3.638 and 3.617 respectively. However, they were neutral on the statement that the use of vendor managed inventory has reduced ordering cost as shown by a mean of 3.338.
The managers agreed that the use of reorder level has reduced inventory holding cost (M=4.000) and stock out (M=3.808). Nevertheless, they were neutral on the statement that the use of reorder level has reduced obsolescence (M=3.276). In addition, the respondents disagreed with the statement that the use of reorder level has reduced ordering cost as shown by a mean of 2.110.

With means of 3.808, 4.000 and 3.744, the respondents agreed that the use of economic order quantity has reduced inventory holding cost, obsolescence and stock out, respectively. In addition, the respondents disagreed with the statement that use of economic order quantity has reduced ordering cost.

The findings show that the managers agreed that the use of enterprise resource planning has reduced stock out, ordering cost, inventory holding cost and obsolescence as shown by means of 3.872, 3.808, 3.680 and 3.531, respectively.

The managers also agreed with means scores of 4.042, 3.851 and 3.787 that the use of material requirement planning has reduced stock out, obsolescence and inventory holding cost, respectively. However, the managers were neutral on the statement indicating that the use of material requirement planning has reduced ordering cost.

Table 5.0: Summary on Influence of Inventory Management Practices on Supply Chain Performance in FMCG Manufacturing Firms in Nairobi

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Inventory Management Practices</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Enterprise Resource Planning</td>
<td>3.723</td>
</tr>
<tr>
<td>2</td>
<td>Material Requirement Planning</td>
<td>3.713</td>
</tr>
<tr>
<td>3</td>
<td>Just in Time</td>
<td>3.586</td>
</tr>
<tr>
<td>4</td>
<td>Vendor managed inventory</td>
<td>3.579</td>
</tr>
<tr>
<td>5</td>
<td>Economic Order Quantity</td>
<td>3.445</td>
</tr>
<tr>
<td>6</td>
<td>Re-order Level</td>
<td>3.299</td>
</tr>
</tbody>
</table>

From the findings on the Table 5.0 above, it was found out that Enterprise Resource Planning had strong influence on the supply chain performance of Fast Moving Consumer Goods
Manufacturers In Nairobi with an average mean of (3.723) While Reorder level had the lowest influence on Supply chain Performance with an average mean of (3.299).

4.6 Inferential Statistics

The study used both correlation analysis and regression analysis to determine the association between the independent variables (just-in-time, vendor managed inventory, re-order level, economic order quantity, enterprise resource planning and material requirement planning) and the dependent variable (supply chain performance).

4.6.1 Correlation Analysis

The study used the Pearson product-moment correlation analysis so as to establish the relationship between the variables. From the findings, there was a positive relationship between material requirement planning and supply chain performance of FMCG manufacturers in Nairobi County (r=632, p=0.00). There was also a significant relationship between vendor managed inventory and supply chain performance of FMCG manufacturers in Nairobi County (r=0.788, p=0.000). In addition, there is a positive relationship between reorder level and supply chain performance of FMCG manufacturers in Nairobi County (r=0.531, p=0.000). There is also a positive relationship between economic order quantity and supply chain performance of FMCG manufacturers in Nairobi (r=0.780, p=0.000). Further, there is a positive relationship between Just in time and supply chain performance of FMCG manufacturers in Nairobi (r=0.517, p=0.000). The results also show that there is also a positive relationship between enterprise resource planning and supply chain performance of FMCG manufacturers in Nairobi (r=0.532, p=0.000).
### Table 5.1: Correlation analysis

<table>
<thead>
<tr>
<th></th>
<th>Supply chain performance</th>
<th>Just in Time</th>
<th>Re-order level</th>
<th>Economic Order Quantity</th>
<th>Enterprise Resource Planning</th>
<th>Material Requirement planning</th>
<th>Vender managed inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply chain performance</td>
<td>Pearson Correlation Sig. (2-tailed)</td>
<td>.517**</td>
<td>.531**</td>
<td>.532**</td>
<td>.632**</td>
<td>.788**</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td>47</td>
</tr>
<tr>
<td>Just in Time</td>
<td>Pearson Correlation Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td>47</td>
</tr>
<tr>
<td>Re-order level</td>
<td>Pearson Correlation Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td>47</td>
</tr>
<tr>
<td>Economic Order Quantity</td>
<td>Pearson Correlation Sig. (2-tailed)</td>
<td>.780**</td>
<td>.949**</td>
<td>.544**</td>
<td>1</td>
<td>.931**</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td>47</td>
</tr>
<tr>
<td>Enterprise Resource Planning</td>
<td>Pearson Correlation Sig. (2-tailed)</td>
<td>.532**</td>
<td>.973**</td>
<td>.632**</td>
<td>.931**</td>
<td>.958**</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td>47</td>
</tr>
<tr>
<td>Material Requirement planning</td>
<td>Pearson Correlation Sig. (2-tailed)</td>
<td>.632**</td>
<td>.961**</td>
<td>.533**</td>
<td>.958**</td>
<td>.955**</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td>47</td>
</tr>
<tr>
<td>Vender managed inventory</td>
<td>Pearson Correlation Sig. (2-tailed)</td>
<td>.788**</td>
<td>.970**</td>
<td>.517**</td>
<td>.962**</td>
<td>.965**</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td>47</td>
<td>47</td>
</tr>
</tbody>
</table>

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

### 4.6.2 Regression analysis

The study used multiple regression analysis to examine the weight of the relationship between the independent variables and the dependent variable. The regression model was
$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + e$

Where:

$Y = $ Supply chain performance in FMCG manufacturing firms

$\beta_0 = $ Y intercept that is the value of Y when X is equal to zero;

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and $\beta_6$ are regression weights coefficients attached to the variables;

$X_1 = $ Just In Time,

$X_2 = $ Vendor Managed Inventory,

$X_3 = $ Re-order Level

$X_4 = $ Economic Order Quantity

$X_5 = $ Enterprise resource planning

$X_6 = $ Material Requirement Planning

e = $ Error Term.

Table 5.2: Regression analysis

<table>
<thead>
<tr>
<th></th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>.581</td>
<td>.115</td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td>Just in Time</td>
<td>.221</td>
<td>.078</td>
<td>.222</td>
<td>.007</td>
</tr>
<tr>
<td>Economic Order Quantity</td>
<td>.345</td>
<td>.050</td>
<td>.395</td>
<td>.000</td>
</tr>
<tr>
<td>Enterprise Resource Planning</td>
<td>.160</td>
<td>.075</td>
<td>.159</td>
<td>.039</td>
</tr>
<tr>
<td>Material Requirement planning</td>
<td>.023</td>
<td>.070</td>
<td>.022</td>
<td>.749</td>
</tr>
<tr>
<td>Vender managed inventory</td>
<td>.276</td>
<td>.085</td>
<td>.292</td>
<td>.002</td>
</tr>
<tr>
<td>Re-order level</td>
<td>.141</td>
<td>.052</td>
<td>.060</td>
<td>.009</td>
</tr>
</tbody>
</table>

According to the findings, Just in Time technique had a positive influence on the supply chain performance of FMCG manufacturers in Nairobi County ($\beta_1=0.221$, p-value=0.007). This implies that increase in the utilization of Just in Time technique would lead to a 0.221 increase in supply chain performance of FMCG manufacturers in Nairobi County.
The results also show that Economic Order Quantity has a positive influence on the supply chain performance of FMCG manufacturers in Nairobi County ($\beta_2=0.345$, p-value=0.000). This implies that a unit increase in the utilization of Economic Order Quantity would lead to a 0.345 improvement in the supply chain performance of FMCG manufacturers in Nairobi County.

In addition, the results show that enterprise resource planning had a positive influence on the supply chain performance of FMCG manufacturers in Nairobi County ($\beta_3=0.160$, p-value=0.039). This shows that a unit increase in the utilization of enterprise resource planning would lead to a 0.160 improvement in the supply chain performance of FMCG manufacturers in Nairobi County. However, the results show that Material Requirement planning has no significant influence on the supply chain performance of FMCG manufacturers in Nairobi County ($\beta_4=0.023$, p-value=0.749).

Further, vendor managed inventory had a positive influence on the supply chain performance of FMCG manufacturers in Nairobi County ($\beta_5=0.276$, p-value=0.002). This implies that a unit increase in the use of vendor managed inventory would lead to a 0.276 improvement in supply chain performance of FMCG manufacturers in Nairobi County.

Lastly, the results show that re-order level has a positive influence on the supply chain performance of FMCG manufacturers in Nairobi County ($\beta_6=0.141$, p-value=0.009). This shows that a unit increase in the utilization of re-order levels would lead to a 0.141 improvement in the improvement in supply chain performance of FMCG manufacturers in Nairobi County.

<table>
<thead>
<tr>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.876</td>
<td>.767</td>
<td>.712</td>
<td>.09638</td>
</tr>
</tbody>
</table>
The R-squared shows the variation in the dependent variable that can be explained by the independent variables being studied. The R-squared in this study was 0.767, which implies that the six independent variables can explain 76.7% of the dependent variable.

Table 5.4: Analysis of Variance

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>46.545</td>
<td>6</td>
<td>7.757</td>
<td>835.184</td>
<td>.000</td>
</tr>
<tr>
<td>Residual</td>
<td>.372</td>
<td>40</td>
<td>.009</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>46.916</td>
<td>46</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The analysis of variance shows whether or not a model is a good fit for the data. The numerator for $\alpha = 5\%$ whose degree of freedom (df) = 6, denominator (df)=40 and critical F value is (2.606). The findings above show that the calculated F value is (835.184) which is greater than the F-critical (2.606), which shows that the model can be used in predicting the influence of the independent variables on the dependent variable. In addition, the p-value (0.000) is less than the significance level (0.05), which shows that the model is a good fit for the data.

4.7 Discussion of the Findings

The study found that FMCG Manufacturing Firms in Nairobi County use just in time stock control system to eliminate waste in the supply chain. These findings agree with Sandeep (2007) argument that Just in time entails producing goods so as to meet the demands of the customer in time and at the right quality and quantity. The study also found that FMCG manufacturing firms make use of vendor managed inventory system, collaborate with their suppliers in system upgrade and use automatic stock tracking. These findings re in line with Prasad and Tata, (2010) Vendor Managed Inventory (VMI) are essential to the supplier as they assist in monitoring inventory used by the customers. The system helps customers to reduce stock outs as suppliers will have their stocks replenished.
The study established that FMCG manufacturing firms in Nairobi County use re-order level to replenish stock. These findings agree with Apte (2010) argument that re-Order level is crucial for manufacturing companies to accomplish optimum effectiveness and be efficient resulting to great supply chain performance and consumer gratification. The study revealed that FMCG manufacturing firms in Nairobi County use economic order quantity to control items according to their stock value and to reduce stock holding cost. These findings agree with Bachetti et al. (2010) contends that stock management requisite to be structured in a reasonable manner in order for the company to be able to tell what time to make an order and how much require to be ordered.

The study revealed that FMCG manufacturing firms use enterprise resource planning system, have an integrated information sharing system and maintain a database for all their suppliers. These findings are in line Lambert (2011) argument that indicates that ERP, which is a key component of integrated supply chain management, helps in the integration of stakeholders in a supply chain. The study also revealed that FMCG manufacturing firms use material requirement planning systems to guide in purchasing of items. The findings agree with Ronald, Ballou (2004), who indicated that MRP is an information system that is computer based and is used in production scheduling and purchase of demand items that are depend. He further noted that MRP primarily is useful in making schedules for high volume custom made materials, parts and supplies whose demand is known well.

The study revealed that Just in Time technique had a positive influence on the supply chain performance of FMCG manufacturers in Nairobi County. In addition, the use of JIT has reduced, obsolescence, inventory holding cost and stock out. However, the study found that the use of JIT has reduced ordering cost in their FMCG manufacturing firms. These finding agree with Porter (1980) argument that Just-in-time (JIT) contributes greatly to the positive supply chain performance of an organization. The study established that vendor managed inventory had a positive influence on the supply chain performance of FMCG manufacturers in Nairobi County. In addition, the study found that the use of vendor managed inventory has reduced stock out, obsolescence, inventory holding cost and ordering cost. The findings concur with Prasad and Tata, (2010) indicated the key VMI advantages included reduction in costs and increased customer service to one or both of the members who are participating.
The study found that re-order level has a positive influence on the supply chain performance of FMCG manufacturers in Nairobi County. Also, the study found that the use of reorder level has reduced inventory holding cost, obsolescence and stock out. Nevertheless, the study revealed that the use of reorder level does not reduce ordering cost. The findings agree with Apte (2010) who noted that reorder levels help in making order of materials and when not to order them. Beamon and Kotleba (2006) also indicated that Re-order level is crucial for manufacturing companies to accomplish optimum effectiveness and be efficient resulting to great supply chain performance and consumer gratification.

The study revealed that Economic Order Quantity has a positive influence on the supply chain performance of FMCG manufacturers in Nairobi County. The use of economic order quantity reduced inventory holding cost, obsolescence and stock out. However, the use of economic order quantity does not reduce ordering cost. The findings concur with Schonberger (2008) who noted that Economic order quantity facilitates the company to plan their stock replacement on an appropriate time base such as monthly, quarterly, half yearly or yearly basis. If a firm does that, it is capable of having minimal costs or zero cost of storage within their warehouses because incoming stock is going out immediately.

The study established that enterprise resource planning had a positive influence on the supply chain performance of FMCG manufacturers in Nairobi County. The use of enterprise resource planning reduced stock out, ordering cost, inventory holding cost and obsolescence. These findings are in line with Song and Zipkin (2011) argument that enterprise resources planning helps in the improvement of decision making because supply chain stakeholders can share relevant information and reduce supply chain communication cost, which in turn significantly influences the performance of the supply chain. The study found that material requirement planning has no significant influence on the supply chain performance of FMCG manufacturers in Nairobi County. The findings are contrary to Martinich (1997) argument that material requirement planning significantly influences supply chain performance among manufacturing firms. However, the use of material requirement planning moderately reduced stock out, obsolescence and inventory holding cost.
CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction
This chapter presents summary of the findings, conclusion, recommendations and areas for further study. The main objective of the study is to determine Impact of inventory management practices on supply chain performance of FMCG manufacturers in Nairobi.

5.2 Summary of the Key Findings
This section presents the summary of the outcome of the two objectives of the study.

5.2.1 Inventory management practices Used in FMCG Manufacturing Firms
The study found that FMCG Manufacturing Firms in Nairobi County use just in time stock control system to eliminate waste in the supply chain. Just in time entails producing goods so as to meet the demands of the customer in time and at the right quality and quantity. The study also found that FMCG manufacturing firms make use of vendor managed inventory system, collaborate with their suppliers in system upgrade and use automatic stock tracking. Vendor Managed Inventory (VMI) is essential to the supplier as they assist in monitoring inventory used by the customers.

The study revealed that FMCG manufacturing firms in Nairobi County use re-order level and economic order quantity to control items according to their stock value and to reduce stock holding cost. In addition, the study revealed that FMCG manufacturing firms use enterprise resource planning system, have an integrated information sharing system and maintain a database for all their suppliers. The study also revealed that FMCG manufacturing firms use material requirement planning systems to guide in purchasing of items.
5.2.2 Influence of Inventory Management Practices on Supply Chain Performance

The study revealed that Just in Time technique had a positive influence on the supply chain performance of FMCG manufacturers in Nairobi County. In addition, the use of JIT has reduced, obsolescence, inventory holding cost and stock out. However, the study found that the use of JIT has reduced ordering cost in their FMCG manufacturing firms. The study established that vendor managed inventory had a positive influence on the supply chain performance of FMCG manufacturers in Nairobi County. In addition, the study found that the use of vendor managed inventory has reduced stock out, obsolescence, inventory holding cost and ordering cost.

The study found that re-order level has a positive influence on the supply chain performance of FMCG manufacturers in Nairobi County. Also, the study found that the use of reorder level has reduced inventory holding cost, obsolescence and stock out. Re-order level is crucial for manufacturing companies to accomplish optimum effectiveness and be efficient resulting to great supply chain performance and consumer gratification.

The study revealed that Economic Order Quantity has a positive influence on the supply chain performance of FMCG manufacturers in Nairobi County. The use of economic order quantity reduced inventory holding cost, obsolescence and stock out. Economic order quantity facilitates the company to plan their stock replacement on an appropriate time base such as monthly, quarterly, half yearly or yearly basis. The study established that enterprise resource planning had a positive influence on the supply chain performance of FMCG manufacturers in Nairobi County. The use of enterprise resource planning reduced stock out, ordering cost, inventory holding cost and obsolescence. The study found that material requirement planning has no significant influence on the supply chain performance of FMCG manufacturers in Nairobi County. However, the use of material requirement planning moderately reduced stock out, obsolescence and inventory holding cost.

5.3 Conclusion

The study concludes that FMCG manufacturing firms in Nairobi County were using inventory management practices such as just in time, vendor managed inventory, re-order level, economic order quantity, enterprise resource planning and material requirement planning. The study also
concludes that inventory management practices (just in time, vendor managed inventory, reorder level, economic order quantity and enterprise resource planning) have a positive effect on supply chain performance measures, which include inventory holding cost, stock out, obsolescence as well as ordering cost. However, the study found that material requirements planning has no significant effect on supply chain performance.

5.4 Recommendations from the Study

The study found that the use of Just in Time technique leads to the elimination of waste among manufacturing firms. This study therefore recommends that all FMCG should increase their JIT technique adoption so as to reduce wastes (time, finances, space and labor) in the production process.

The study found the use of Vender managed inventory systems led to an improvement in supply chain performance. The study therefore recommends that all manufacturing firms should adopt Vender managed inventory systems so as to automatic stock tracking.

The study also established that the use of re-order level to replenish stock had a significant influence on supply chain performance. The study therefore recommends that should set their reorder levels, so as to ensure that the stock is replenished whenever it goes below the set levels.

The study established that the use of Enterprise Resource Planning led to an improvement in supply chain performance. The study therefore recommends that manufacturing firms should adopt ERP so as to enhance information sharing with suppliers.

5.5 Limitations of the Study

One of the challenge that faced the study was that some FMCG managers failed to fill the questionnaires as they were busy serving their customers. However, in such cases, the researcher left the questionnaires for them to fill at their free time. The questionnaires were then collected after two days. Some of the FMCG managers felt as if they were being investigated and hence were hesitant to fill the questionnaires. The researcher however worked at winning their confidence by ensuring participants confidentiality.
5.6 Areas for Further Research

This study was conducted in the Nairobi, and due to difference in business environment in different parts of Kenya, generalizing the findings of this study is not possible. Therefore, the study suggests similar studies in other Counties in Kenya. Since the growth of supply chain performance of FMCG manufacturers does not depend on inventory management practices only, further studies should therefore be done to identify other factors affecting supply chain performance of FMCG manufacturers such as warehouse management, information technology, strategic supplier partnership, lean inventory systems and legal policies of the procurement function in the manufacturing industry.
REFERENCES


Bryman, A. (2003). Integrating quantitative and qualitative research: how is it done?’ *Qualitative research, 6*(1), 97 – 113.


*European Journal of Academic Essays* 2(6), 2183-3818.


APPENDICES

Appendix I: Questionnaire

Introduction

This questionnaire has been designed for the sole purpose of collecting data on the effect of inventory management practices and supply chain performance of FMCG manufacturers in Nairobi. The data collected will be treated with a very high degree of confidentiality and it is meant for academic purpose only.

SECTION A: General Information

1. Gender
   Male   [   ]    Female   [   ]

2. Kindly indicate the age bracket you belong
   Below 25 years   [   ]    between 25 and 35 years   [   ]
   Between 36 and 45 years   [   ]    above 45 years   [   ]

3. For how long have you been working in your organization?
   Below 1 year   [   ]    between 1 and 5 years   [   ]
   Between 5 and 10 years   [   ]    above 10 years   [   ]

4. What is your position in your organization?
   Warehouse manager   [   ]    Operations Manager   [   ]
   Supply Chain manager   [   ]

5. Which is your highest level of education?
   Secondary Certificate   [   ]    Diploma   [   ]
   Undergraduate Degree   [   ]    Postgraduate Degree   [   ]
   Any other (specify) .................................................................
6. Kindly indicate the category of FMCG your firm manufacture.

   Basic Products  [ ]  Secondary Products  [ ]
   Leisure Products  [ ]

Section B: Inventory management practices Used in FMCG Manufacturing Firms in Nairobi

7. Using the below Likert scale, state the extent to which you agree with the statements on the inventory management practices used in your organization (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree) Please mark with a CROSS (X) in the applicable box.

<table>
<thead>
<tr>
<th>Statements on inventory management practices</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Just in Time</td>
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<tr>
<td>FMCG uses JIT stock control system</td>
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<tr>
<td>FMCG uses the JIT system to eliminate waste</td>
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<td></td>
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<tr>
<td>Vendor Managed Inventory</td>
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<td></td>
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<tr>
<td>FMCG practices vendor managed inventory systems</td>
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<tr>
<td>FMCG collaborates with its suppliers in system upgrade</td>
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<td></td>
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<tr>
<td>FMCG uses automatic stock tracking</td>
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<tr>
<td>Re-Order Level</td>
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<tr>
<td>FMCG uses re-order level to replenish stock</td>
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<tr>
<td>Economic Order Quantity</td>
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<tr>
<td>FMCG uses Economic Order Quantity to control items according to their stock value</td>
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<tr>
<td>FMCG uses Economic Order Quantity to reduce stock holding cost</td>
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<tr>
<td>Enterprise resource planning</td>
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</tbody>
</table>
FMCG uses Enterprise Resource Planning system

FMCG has an integrated information sharing system

FMCG maintains a database for all its suppliers

**Material Requirement planning**

FMCG uses Material Requirement planning system

FMCG uses material resource planning to purchase demand items

8. How else do inventory management practices influence supply chain performance of FMCG manufactures in Nairobi?

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**SECTION C: Supply Chain Performance**

9. Using the below Likert scale, state the extent to which you agree with the following statements on the influence of inventory management practices on measures of supply chain performance (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree) Please mark with a CROSS (X) in the applicable box

<table>
<thead>
<tr>
<th>Statements on Supply chain performance,</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of JIT has reduced</td>
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<tr>
<td>• Inventory holding Cost</td>
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<td>• Stock Outs</td>
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<tr>
<td>• Obsolescence</td>
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<tr>
<td>• Ordering cost</td>
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<tr>
<td>Use of Vendor Managed Inventory has reduced</td>
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<tr>
<td>• Inventory holding Cost</td>
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<tr>
<td>• Stock Outs</td>
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</tbody>
</table>
- Obsolescence
- Ordering cost

Use of Reorder level has reduced
- Inventory holding cost
- Stock outs
- Obsolescence
- Ordering Cost

Use of Economic order quantity has reduced
- Inventory holding cost
- Stock outs
- Obsolescence
- Ordering Cost

Use of Enterprise Resource Planning has reduced
- Inventory holding cost
- Stock outs
- Obsolescence
- Ordering cost

Use of Material Requirement Planning has reduced
- Inventory holding cost
- Stock outs
- Obsolescence
- Ordering cost

In a scale of 1 to 5 rate how inventory management practices impact on supply chain performance of FMCG of manufacturing firms in Nairobi

10. Others (specify).

........................................................................................................................................
........................................................................................................................................
........................................................................................................................................
Thank you
Appendix II: List of Fast Moving Consumer Goods Manufacturers in Nairobi

1) Brookside Dairy Limited
2) Glacier products Ltd
3) Bio food Products Limited
4) New Kenya Cooperative Creameries Ltd
5) Farmers Choice Limited
6) Kenchic Limited
7) Wrigley East Africa Limited
8) Chandaria Industries Ltd
9) Kimfay (EA ) Ltd
10) Unga ltd
11) Pembe flour mills
12) Nairobi flour Mills
13) Kabansora Millers Ltd
14) United Millers Ltd
15) Super loaf bakers
16) Cake world
17) East African Breweries
18) Coca-Cola company
19) Pepsi Cola (E.A) Ltd
20) British American Tobacco
21) Lyons Maid
22) Unilever ltd
23) Pz cussons East Africa Ltd
24) Kaysalt Ltd
25) Ken salt Ltd
26) Manji Ltd
27) GlaxoSmithKline [GSK ]
28) Haco Industries (K) Ltd
29) Alpha Fine Foods Ltd
30) Kapa Oil refineries Ltd
31) Nestle Food Ltd
32) Beta healthcare International Ltd
33) C& R Food Limited
34) Kenya Tea Development Agency Holding Ltd( KTDA)
35) Kenafric Industries Ltd
36) Kenya wine Agencies Limited
37) Wines of the World
38) Ozzbeco Kenya Limited
39) Inter Consumer products Ltd
40) Jetlak Foods Limited
41) KAM Industries Ltd
42) Tri clover Industries Ltd
43) Patco Industries Ltd
44) Weetabix EA Ltd
45) Top Food EA Ltd
46) Alex Africa Limited
47) Golden Africa Kenya Limited
48) Sunripe Limited
49) Alpine Coolers Limited
50) Crown Beverage Ltd
51) Tropical Heat limited

Source: https://www.businesslist.co.ke/category/food-manufacturing/2/city:nairobi
https://yellow.co.ke/categories/food-manufacturing/?page=1