



**DETERMINANTS OF IMPLEMENTATION OF INVENTORY MANAGEMENT PRACTICES IN FAST MOVING
CONSUMER GOODS MANUFACTURING FIRMS IN NAIROBI COUNTY, KENYA**

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ABSTRACT

The aim of the study was to establish the determinants of inventory management practices in fast moving consumer goods manufacturing firms in Nairobi County, Kenya. The study focused on 120 FMCG manufacturing firms who were members of Kenya Association of Manufacturers. Statistical Package for Social Science (SPSS) was used to analyse the data. The data showed that the high R square was 0.620. It showed that the independent variables in the study were able to explain 62.00% variation in the implementation of inventory management practices in fast moving consumer goods manufacturing firms in Nairobi County, Kenya. The remaining 38% was explained by the variables or other aspects outside the model. This implied that these variables were very significant and they therefore needed to be considered in any effort to boost implementation of inventory management practices in fast moving consumer goods manufacturing firms in Nairobi County, Kenya. The study recommended that there is need for setting up purchase volumes which is based on usage, urgency and perishability and the guidelines and the level of implementation of procurement practices need to be well articulated. The study established that procurement outsourcing strategies plays a significant role on the implementation of inventory management practices in manufacturing firms. The study recommended for the adoption of supply chain forecasting enhancing implementation of inventory management practices in manufacturing firms. There is need the organization to have the correct forecasting methods thus reduction of stock outs in the organization. The study recommended for the enhancement of manufacturer and supplier collaboration plays a significant role on the implementation of inventory management practices in manufacturing firms. The study recommended for the appraisal of manufacturers and suppliers annually and they ensure the suppliers are paid in time.

Keywords: Volume of Purchases, Procurement Outsourcing Strategies, Manufacture/Supplier Collaboration, Supply Chain Forecasting, Inventory Management

INTRODUCTION

Inventory management is the on-going and systematic process of supervising the flow of non-capitalized assets and stock within a firm. The main objective of inventory management which is an inherent component of the supply chain management is to ensure a constant and uninterrupted flow of commodities from the location of the firm to the point of sale (Kot et. al., 2011). It ensures continuous monitoring and the keeping of an intricate record of new products entering or leaving the firm's warehouse or point of sale. Inventory management includes the salient aspects of oversight in the ordering of inventory, the control of the production process and storage of inventory. The key purpose of inventory management is to foster effectiveness in an entity by creating a framework that avoids spoilage of products, dead stock and optimizing on organisation capacity to save on storage cost (Grondys et al., 2014). Withal, it fosters the amelioration of cash flows as it allows the management to have fore knowledge of the available inventory based on the sales, this ensures that the organization does not experience a deficit in production or suffer stock outs that may pose critical impediments to the entity. The primal purpose of inventory management is to ensure an uninterrupted and continuum flow of goods, customer service levels and sales in the firm. It is a fundamental component that underpins for increased efficiency in the firm's operation management.

For any business to stay profitable, it is important that it minimizes its costs. This is especially the case with manufacturing companies since they must watch their operating costs, which could be variable and may form a huge proportion of their expenses. Currently, there is a proliferation of manufacturing companies in Kenya, which has led to intensification of competition (Ogutu & Mbula, 2012). To stay afloat in the contemporary marketplace that is characterized by rivalry and laws that regulate market conduct, firms cannot pass the cost of their

inefficiencies to product prices (Kamau & Kagiri, 2015). Concomitantly, the only viable option that firms can take is optimizing the efficiency of their operations. From a manufacturing standpoint, the firms must ensure that production is well planned to avoid purchase of unnecessary raw materials or those that may require unnecessary production in a bid to beat expiry dates of raw materials.

Currently, the global society is characterized by fast information dissemination than ever before (Kamau & Kagiri, 2015). Regulations, technology, taste and preferences keep changing as global firms and nations engage continuous improvement measures to attain better standards in goods and services. This means that firms must re-invent themselves by having new product developments, better packaging materials, sophisticated production technologies and engaging in more Corporate Social Responsibility (CSR) activities to keep their company image and remain relevant. This process of change has been found to result in instances of obsolete and excess inventory (Nimocks, 2015).

In the US, Hendricks and Singhal (2009) found out that organizations that had excess inventory and notified the public about it had a reduction in stock prices. Based on the sample that the researchers used for the study, about 74% of the firms faced a decrease in their stock prices on the day they announced excess inventory. Further, they noted that the price reduction was relatively lower for large firms and higher in firms that had high growth prospects.

South Africa is the leading industrialised country in Africa with a Gross Domestic Product (GDP) of 294.84 billion US dollars in 2016 (World Bank, 2016). It has a well-developed FMCG sector but off late it is facing inventory challenges rendering them being less competitive (Ambe, 2012). According to Ambe (2012) poor control of purchases has resulted in high inventory-holding costs, lead time with serious

consequences of industry performance. The challenges of high inventory cost by FMCG firms in South Africa were attributed to over relying inventory management. Traditional inventory management have the limitation of always focusing on improving forecasting, which is a small part of the overall inventory management. It fails to consider other factors like retail store shelf which also determine the amount of inventory problem. According to Phetia (2015), lack of adequate consultation among the employees in the supply chain has led to excess inventory in FMCG firms in South Africa. As a result of excess inventory and change of customer tastes and need of rebranding has led to obsolete stocks in FMCG firms in South Africa.

In Kenya, Kamau and Kagiri (2015) studied the effect of inventory management on the competitiveness of Safaricom, a telecommunication firm. The study found out that inventory investment, shrinkage and turnover had an effect on the competitiveness of Safaricom Ltd. Further, they opined that it is important for firms to avoid having excess inventory by ensuring they have accurate forecasts. They recommended that Safaricom should have an inventory system that is vendor-managed to ensure that they minimize stock outs and instances of excess inventory.

Statement of the Problem

The issue of having excess and obsolete inventory is an issue that most companies in the contemporary business environment grapple with. When a business cannot manage the correct amount of inventory, it is likely to incur costs that originate from either excessive carrying costs or lost sales (Kot, Grondys & Szopa, 2011). Conversely, businesses that effectively manage their inventory can maximize their profits and customer satisfaction. Failure to adhere to inventory management practices has a formidable effect on market share, customer satisfaction and profit maximization. Excess and obsolete inventory in

companies can lead to poor performance of manufacturing entities in the final end of year balance sheet (PricewaterhouseCooper, 2012). A study by Eroglu and Hofer (2011) observed that leanness was the best inventory control tool as it helps the management to reduce the amount of inventory they hold, which leads to a reduction in inventory carrying costs. Studies have found out that good inventory management practices (IMP) influence the amount of excess inventory (Grondys *et al.*, 2014), competitiveness of a firm (Kamau & Kagiri, 2015), operational performance (Mogere *et al.*, 2013) and customer satisfaction (Thogori & Gathenya, 2014). According to Kakwezi and Sony (2010), procurement planning is an essential aspect in service delivery but many studies focuses on service delivery ignoring other measures of procurement like financial gains that result from cost reduction as a result of optimum procurement. Nevertheless, most of the studies done focused on IMP but very few have narrowed down to procurement-related factors that contribute to excess and obsolete inventory especially in FMCG. This study therefore sought to fill this literature gap by evaluating the determinants of inventory management practices in fast moving consumer goods manufacturing firms in Nairobi County, Kenya.

Objectives of the Study

The main objective of the study was to establish the determinants of implementation of inventory management practices in fast moving consumer goods manufacturing firms in Nairobi County, Kenya. The specific objectives were:-

- To determine the effect of volume of purchases on implementation of inventory management practices in fast moving consumer goods manufacturing firms in Nairobi County, Kenya.
- To establish the influence of procurement outsourcing strategies on implementation of inventory management practices in fast moving

consumer goods manufacturing firms in Nairobi County, Kenya.

- To find out the effect of manufacture/supplier collaboration on implementation of inventory management practices in fast moving consumer goods manufacturing firms in Nairobi County, Kenya.
- To determine the influence of supply chain forecasting implementation of inventory management practices in fast moving consumer goods manufacturing firms in Nairobi County, Kenya

LITERATURE REVIEW

Economic Order Quantity Model

The model of Economic Order Quantity (EOQ) was developed by Ford W. Harris (Thomopoulos, 2016). This module is used to determine the relationship between size and cost of inventory. In inventory management, EOQ is used to determine the order quantity that minimizes the total holding costs and ordering costs. In other words the EOQ is the amount of inventory that minimizes the ordering and holding cost. The key assumptions of this model are: a relatively uniform rate of demand, fixed item cost, fixed ordering and holding cost and a standard lead time (Erlenkotter, 1990). Figure 1 depicted the Economic Order Quantity model.

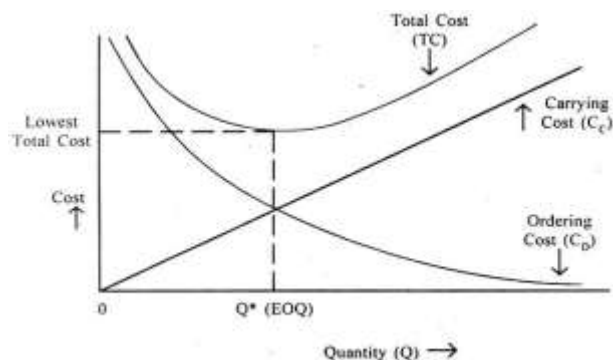


Figure 1: The Economic Order Quantity Model

Adopted from Erlenkotter, 1990

The EOQ model is appropriate in managing stocks in Fast Moving Consumer Goods (FMCG) firms. The model helps to maintain an optimum quantity to minimize the holding and ordering costs. Therefore, the management has to ensure that the quantity of inventory ordered is optimal to minimize the ordering and holding costs. This model (EOQ), explains that there is a negative or positive relationship between purchasing and size of the inventory. The nature of relationship of the variables in the EOQ model determines the position of excess and obsolete inventory in a firm. The EOQ model has been used supply chain studies to assist the researchers identify integrated supply chain problem to determine the causes of excess inventory. For example Mohan (2015), used EOQ model to determine the effect of price on deteriorating stock levels fuzzy environment. Sunhal and Manga (2017) employed EOQ model in a supply chain study to analyse inventory management in an engineering firm. In both studies the EOQ model was used to explore the procurement factors that affect stock levels in manufacturing. In this study EOQ model will therefore be used to profile the determinants of excess procurement and obsolete in inventory in FMCG firms in Kenya.

Agency Theory

The agency theory is a school of thought that has been applied extensively in organizational behaviour though currently it's being adopted in other fields. The agency theory involves two parties: the principal, who delegates work to the second party, the agent. The primary role of the agency theory is to resolve issues that occur when the desires of the principal and agent conflict and when it is cumbersome for the principal to determine what the agent is doing (Eisenhardt, 1989). For the purposes of this study, the FMCG organization making a purchase is the principal whereas the supplier is the agent. According to Eisenhardt (1989), the variables that affect the agreement between the principal and agent are "outcome uncertainty, risk aversion, goal conflict and

relationship length". In the case that there is uncertainty in supply, the agency theory states that one of the best ways of mitigating it is through buffer stock.

This theory will be used to inform the dynamics surrounding supply chain behaviours and relationships. These dynamics may be influenced by buffer stock, unreliable supplier, customer demands and cost of logistics. The role of the buffer stock is to minimize the effects of supply uncertainty on a business. In the case of an FMCG firm, if a supplier is unreliable the organization is likely to have a large buffer stock, and the excess inventory has financial ramifications on the organization. In other instances, excess inventory can result when customer demands decrease (Zsidin & Ellram, 2003) while a stock out can occur when suppliers do not have the ability to meet high demand. Therefore, the agency theory posits that the best remedy to the situation is through reducing the distance between the supplier and final consumer in the supply chain. In the case of FMCG firms, the distance can be reduced by having a short and clear distribution channel and by collecting feedback from customers. The Agency will go along in profiling the factors within and without the FMCG firms that influence or contribute to excess and obsolete inventory.

Lean Theory

The lean theory is aimed at waste minimization in manufacturing firms. The key principles of lean manufacturing are aimed at optimizing value while reducing any type of waste and the efficacy of the theory has been proved in various studies. Green and Inman (2005), for instance, found out that the lean theory helps to eliminate buffer stock and reduces waste in production. In another study, Eroglu and Hofer (2011) found that leanness was the best inventory control tool since it enables the management to reduce the amount of inventory they hold, which leads to a reduction in inventory carrying

costs. Inventory management is an important component in the lean theory and proponents opine that it helps to match demand and supply at all points of the supply chain.

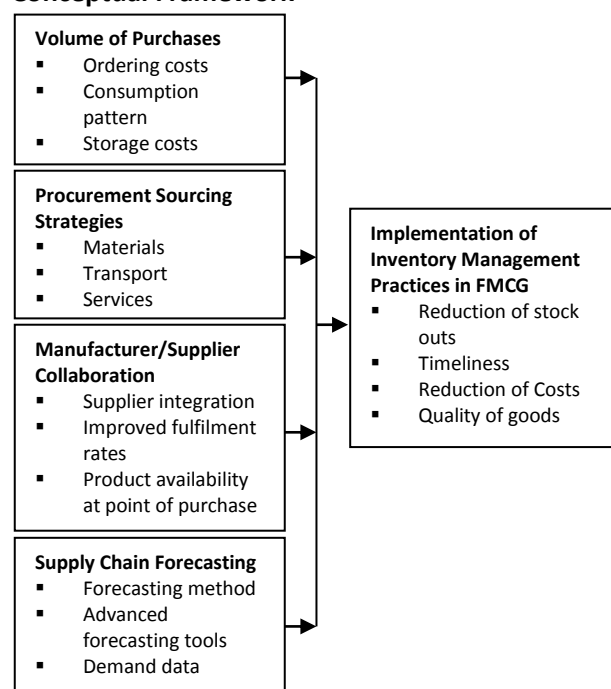
Setting Par Level is a fundamental inventory management technique that propagates for efficiency and effectiveness in a firm. Par level is a salient approach that constitutes placement and determination of the minimum amount of inventory that the organization needs to have in hand (Chandra & Grabis, 2008). In the event the stocks fall below the set par levels then it is imperative for the organization to place an order for more items with the aim of ensuring an adequate flow of the products at any time. It enables the organization to meet the needs and requirements of the customer overarchingly. Consequently, the intrinsic benefit of setting par level is that it allows the management to effectively ensure the pars do not sit on too much inventory leading to the tie up of liquid cash (Green & Inman, 2005). Seasonality and the continuous changes in consumer preferences are the predominant drawbacks that negatively influence the setting of pars inventory management system.

Radasanu (2016) observed that it is important to minimize the value of inventory since it has a direct effect on the ROI of a firm. This means that if a firm has excess inventory, the value of inventory would be high, leading to a low ROI and vice versa. Poor management of inventory is a major problem for manufacturing firms, more so in FMCG firms, which leads to excess inventory, which is considered a waste in the lean theory. Aljunaidi and Ankrak (2014) applied the lean theory in FMCG firms in the UK and they found out that over processing and excess inventory were the main sources of waste. Davis (2013) posits that the minimum order quantity is elemental in ensuring there is minimal excessive inventory that may stimulate heightened inventory costs in the firm. It provides the entity with a

framework that is rudimentary in ensuring the sustainment of the most relevant levels of inventory thus curtailing the sporadic occurrences of excessive inventory. Minimal order quantity is essential in helping to offset the higher inventory costs by mitigating the occurrences of excessive inventory. Storing excessive inventory instigates a rise in the inventory costs, which poses a detrimental impact to the firm.

In this study the lean theory will be used to identify and explain the stock management techniques which have the possibility of contributing to excess inventory. It will also be employed to identify the purchasing practices that violate lean inventory principles. In so doing this theory will be useful in identifying supply chain issues that may contribute to excess inventory and absolute stock in FMCG firms in Kenya.

Conceptual Framework



Independent Variables Dependent Variable
Figure 2: Conceptual Framework

Volume of Purchases

Nowadays businesses are becoming more and more competitive, and for companies to preserve their competitive edge, purchasing has started to receive more attention. Campbell and Morris (2014) state that in many companies purchasing used to be seen as a cost centre, naturally because money is spent to buy materials. These days purchasing is seen more as a profit centre, because every cent that is saved in purchasing is a direct profit for a company; furthermore, purchasing is perceived as a value adding function (Morris, 2013). Lysons and Farrington (2010) state that the classic definition of purchasing objectives is to buy goods and services in the right quantity, at the right price, in the right quality, from the right suppliers at the right time. The difference between purchasing and procurement is that purchasing is an act of obtaining goods and services by paying money for it and procurement is the process of acquiring goods and services in any possible way.

Procurement Sourcing Strategies

Sourcing strategies refer to the process that firms use when making purchases of items. The primary role of procurement sourcing strategies is to ensure planning is optimized and that the rules of engagement with suppliers are clearly defined (Stadtler, 2015). The key parameters for this variable are amount of savings for the procurement sourcing strategy, the lead time and ROI for the procurement strategy. Lead time, which is the amount of time that lapses between ordering and receipt of products, influences the amount of obsolete inventory (Davis, 2013). If the lead time is high, then there is a possibility that some of the inventory would be out of date in a short amount of time. The ROI of a procurement strategy is also important and it entails the rate at which the company will profit from purchasing goods using a given strategy. Radasanu (2016) opines that the best

procurement strategy should minimize the amount of inventory while optimizing ROI.

Manufacturer and supplier Collaboration

It is a without a doubt that the successful development of SCM performance has to focus on customers' needs and wants (Chandra & Kumar, 2010; Svensson, 2013). Consequently, the performance of the supply chains can affect customer satisfaction. That's why the best combination of the constituent has to be found, in order to ensure that the core objective of satisfying customer requirements at the lowest possible cost is achieved. No single component can be seen disjointedly from the other but they have to be viewed through both the effects of the channel system and the critical effect. Collaboration, in the context of the supply chain (Barratt, 2004), is to share the joint objections; an intelligence of commitment; trust and respect; skills and knowledge; and intellectual agility. Supplier/manufacturer collaboration provides benefits to the chain members. That is why collaboration has become one of the most talked about topics in business area (Min *et al.*, 2005). Especially in today's complex competition business environment, collaboration is the driving force behind effective supply chain management. However, the argument is that 'collaboration' is more important in the supply chain management.

Supply Chain Forecasting

The procurement department is involved in forecasting in order to determine the levels of inventory that a firm should acquire. According to Johnson and Ruankaew (2017), the supply chain plays an important role in minimizing inventory holding costs that are caused by having excess or low inventory. One of the parameters of this variable is the type of procurement forecasting method. According to McCarthy and Golicic (2002), consistent, systematic and appropriate forecasting processes positively impact performance through decreased

operation costs, improved customer service, increased sales and reductions in inventory. This means that the procurement forecasting technique influences inventory levels and therefore is consequential to the occurrence of excess inventory. The other parameter is the percentage efficiency of forecasts from previous years. The last parameter for this section would be stock turnover. Stock turnover is determined by dividing the total sales of goods over the average inventory in a certain period (Chapman, Arnold, Gatewood & Clive, 2015). A low ratio of stock turnover is an indicator of excess inventory. According to Wang and Disney (2016), stock turnover is the best way of measuring the Bullwhip Effect, which involves the volatility of orders along the supply chain. This volatility of orders is a prime cause of excess inventory in the warehouses of most firms.

Empirical Review

Procurement Outsourcing Strategies

A study by Hassan and Alim (2015) on the Factors affecting supply chain management efficiency in cross border outsourcing: A case study of H & M and its outsourcing operations in Bangladesh. The purpose of our thesis is to investigate how inefficiency factors affect the Supply Chain system of Multi National Corporations (MNC"s) during outsourcing process. With that view the study had to analyze what implications of these factors in overall efficiency in entire value chain System, how this factor affects Supply Chain efficiency and, in particular, which factors are significantly responsible for inefficiency. We would also analyse probable solutions to minimize inefficiency in Cross Border Outsourcing Finding shows that some factors acting as a hindrance to this smooth operation in cross boarder outsourcing. Finally we analysed several factors and find out the potential ways to minimize the effect of these inefficiency factors and recommended some probable measures to increase overall supply chain efficiency in total value chain system. According to

the Outsourcing Institute, on average, companies can save 9% of production costs and increase the capacity and quality by 15% through global outsourcing (Elmuti & Kathawala, 2000). Multinational Corporations (MNCs) use to go for internationalization of their production in low cost countries in order to achieve the competitive advantages in their own business field. The comparative advantages of different countries and companies" intention to maintain increased focus on their core businesses drive them to go offshore for sourcing their needs.

Manufacturer and Ssupplier Collaboration

MBaisi and Chirchir (2016) did a study on the Factors affecting supply chain integration in large manufacturing firms in Kenya. The objectives of this study was to determine the extent of supply chain integration in large manufacturing firms in Kenya, to establish the factors affecting supply chain integration on large manufacturing firms in Kenya, and to determine the effect of the identified factors on the implementation of SCI on large manufacturing firms in Kenya. The study was based on cooperative game theory and systems theory. The study adopted a descriptive research design. A survey method was used to collect primary data. The survey approach was proposed because it provides a quick, inexpensive, efficient and accurate means of assigning information about the population. This study targeted all large manufacturing firms in Kenya that were members of KAM. Data collection was done through the use of closed-ended questionnaires. The data were summarized and tabulated using descriptive measures. Factor analysis was used to identify the underlying factors.

Supply Chain Forecasting

Supply chain management (SCM) software can help facilitate the process of forecasting and measuring the supply chain synchronizes the supply and demand cycle through the use of real-time information. As a

result, inventory is less likely to sit unused (Shen, 2006). For example, a baked goods manufacturer using SCM software can monitor its inventories and place an electronic order to its suppliers in anticipation of a spike in demand. Experience is also an asset when it comes to managing your supply chain. Having years of demand data helps you better predict future demand (Kinsey, 2009).

METHODOLOGY

This study adopted descriptive survey design and analytical research methods to collect primary data. According to Kothari (2004) descriptive survey design has the advantage enabling the study to describe the situation or phenomenon of the study at that time. The target population of this study was all the 120 manufacturing firms drawn from the 5 key industrial subsectors located in Nairobi and its surroundings. The study respondents were supply chain managers of the targeted manufacturing firms. Primary data was collected by use of a structured questionnaire. Primary data collected was subjected to quantitative analysis techniques. Data from questionnaires was cleaned, coded and keyed into the Statistical Package for Social Sciences (SPSS) version 20 software for analysis. The regression analysis fitness model was set as:

$$Y = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \alpha_4 X_4 + e$$

Where:

Y= The dependent variable (Implementation of Procurement Practices)

α_0 - Constant term

α_1, α_2 and α_3 - Regression coefficients that represent the condition of the independent variable to the dependent variables

X_1 - Volume of Purchases

X_2 - Procurement Outsourcing Strategies

X_3 - Manufacturer/Supplier collaboration

X_4 - Supply chain forecasting

E - This is a provision for error, which may be caused by extraneous factor

FINDINGS

Volume of Purchases

The study sought to establish the extent to which respondents agreed with the statements relating to whether volume of purchases influence implementation of inventory procurement practices in fast moving consumer goods in Nairobi county, Kenya. On a scale of 1-5, the scores were as follows: The scores “Very small extent=VSE” and “Small extent=SE” were represented by mean score, equivalent to 1 to 2.5 on the continuous Likert scale ($1 \leq \text{Small extent} \leq 2.5$). The scores of ‘Moderate extent=ME’ were represented by a score equivalent to 2.6 to 3.5 on the Likert scale ($2.6 \leq \text{Moderate extent=ME} \leq 3.5$). The score of “Great extent=GE” and “Very great extent=VGE” were represented by a mean score equivalent to 3.6 to 5.0 on the Likert Scale ($3.6 \leq \text{Great extent} \leq 5.0$). The results were presented in mean and standard deviation as illustrated in Table 1.

From the study results, majority of the respondents agreed that the volumes purchased influence consumption patterns as shown by a mean of 3.568, Purchasing in large volumes gives competitive advantage as shown by a mean of 2.580; Firm buys smaller batches only when needed as shown by a mean of 2.680; purchasing in large volumes leads to higher adoption of product and process involvement as shown by a mean of 3.568; Purchasing in large volumes contributes to lean innovations and

continuous improvement as shown by a mean of 3.234; Purchasing in volumes leads to few and long term relationship with the suppliers as shown by a mean of 2.876; Volumes have lowered costs through economies of scale as shown by a mean of 2.567; Purchasing in volume has led to the firm not relying on inspecting of products as shown by a mean of 3.129. Purchasing in volumes has led to use of containers, cards or visual cue to control movements of materials as shown by a mean of 3.120. This implies that volume of purchase influence inventory management practices in the fast moving consumer goods manufacturing firms in Kenya. This confirmed with Waters and Fuller (2015) who suggest that the difference between lean and traditional way of procurement is that the traditional approach uses multiple sources and short term contracts, instead of single sourcing and long term contracts which lean is associated to. Ansarri and Modarress (1988) emphasize that lean procurement involves smaller batches, less quality inspection and administrative work, which is in line with lean’s philosophy of doing more with less. The respondents were neutral about: Purchasing in large volumes leads to higher adoption of product and process involvement, Purchasing in volume has led to the firm not relying on inspecting of products and Purchasing in volumes has led to use of containers, cards or visual cue to control movements of materials.

Table 1: Volume of Purchases and Implementation of Inventory Management Practices

Volume of Purchases	Mean	Std. Dev
Volumes purchased influence consumption patterns	3.568	1.582
Purchasing in large volumes gives competitive advantage	2.580	.614
Firm buys smaller batches only when needed	2.680	1.067
Purchasing in large volumes leads to higher adoption of product and process involvement	3.568	1.525
Purchasing in large volumes contributes to lean innovations and continuous improvement	3.234	.876
Purchasing in volumes leads to few and long term relationship with the suppliers	2.876	.872

Volumes have lowered costs through economies of scale	2.567	.345
Purchasing in volume has led to the firm not relying on inspecting of products	3.129	1.987
Purchasing in volumes has led to use of containers, cards or visual cue to control movements of materials	3.210	.876

Procurement Outsourcing Strategies

The study sought to establish the extent to which respondents agreed with the statements relating to whether procurement outsourcing strategies influence implementation of inventory procurement practices Kenya. On a scale of 1-5, the scores were as follows: The scores "Very small extent=VSE" and "Small extent=SE" were represented by mean score, equivalent to 1 to 2.5 on the continuous Likert scale ($1 \leq \text{Small extent} \leq 2.5$). The scores of 'Moderate extent=ME' were represented by a score equivalent to 2.6 to 3.5 on the Likert scale ($2.6 \leq \text{Moderate extent=ME} \leq 3.5$). The score of "Great extent=GE" and "Very great extent=VGE" were represented by a mean score equivalent to 3.6 to 5.0 on the Likert Scale ($3.6 \leq \text{Great extent} \leq 5.0$). The results were presented in mean and standard deviation as illustrated in Table 2.

As indicated by high levels of agreement, a majority of respondents affirm that the service providers are always ready to offer a competitive cost thus cost reduction in the organization (mean of 3.564 and Std of 1.009) though the sentiments were very much contested as shown by a standard deviation above 1.0.; The original equipment manufacturer was used to predict demand beyond a 4 week horizon (mean of 3.112 and Std of 1.357) though the sentiments were very much contested as shown by a standard deviation above 1.0; Outsourcing frees up cash thus allowing investments on core activities and improves

organization focus (mean of 3.088 and Std of 1.346) though the sentiments were very much contested as shown by a standard deviation above 1.0. It frees management time and reduces staff costs as well as giving organization flexibility (mean of 3.458 and Std of 1.009) though the sentiments were very much contested as shown by a standard deviation above 1.0.; It provides an improved quality by utilizing a service provider who has more knowledge, experience and expertise (mean of 3.112 and Std of 1.456) though the sentiments were very much contested as shown by a standard deviation above 1.0. It freed up management and instilled confidence in them to take up more risk in core areas which have more value addition (mean of 3.112 and Std of 1.456) though the sentiments were very much contested as shown by a standard deviation above 1.0. The study findings were in agreement with literature review by Kenneth and Lysons (2006) who established that the service provider must be ready to offer a competitive cost. These costs should be compared with that of in-sourcing or planned budget and an analysis done to justify its viability. Clear boundaries should be drawn to show all areas covered in the costing. Occasionally the costs should be reviewed in view of adjusting either upwards or downwards depending on market changes. Outsourcing frees up cash thus allowing investments on core activities, improves organization focus, frees management time and reduces staff costs as well as giving more organization flexibility.

Table 2: Procurement Outsourcing Strategies and Implementation of Inventory Management Practices

Procurement Outsourcing Strategies	Mean	Std. Dev
The service providers are always ready to offer a competitive cost thus cost reduction in the organization	3.564	1.0092

Outsourcing frees up cash thus allowing investments on core activities and improves organization focus	3.112	1.3578
It frees management time and reduces staff costs as well as giving organization flexibility	3.088	1.3462
It provides an improved quality by utilizing a service provider who has more knowledge, experience and expertise	3.458	1.0094
It frees up management and instil confidence in them to take up more risk in core areas which have more value addition	3.112	1.4562

Manufacturer and Supplier Collaboration

The study sought to establish the extent to which respondents agreed with the statements relating to whether manufacturer and supplier collaboration influence implementation of inventory procurement practices Kenya. On a scale of 1-5, the scores were as follows: The scores “Very small extent=VSE” and “Small extent=SE” were represented by mean score, equivalent to 1 to 2.5 on the continuous Likert scale ($1 \leq \text{Small extent} \leq 2.5$). The scores of ‘Moderate extent=ME’ were represented by a score equivalent to 2.6 to 3.5 on the Likert scale ($2.6 \leq \text{Moderate extent} \leq 3.5$). The score of “Great extent=GE” and “Very great extent=VGE” were represented by a mean score equivalent to 3.6 to 5.0 on the Likert Scale ($3.6 \leq \text{Great extent} \leq 5.0$). The results were presented in mean and standard deviation as illustrated in Table 3.

From the results, majority of the respondents were neutral that they do appraise the manufacturers and suppliers annually, they ensure the suppliers are paid in time (mean of 3.335 and Std of 1.909) though the sentiments were very much contested as shown by a standard deviation above 1.0; they ensured the manufacturers and suppliers were paid in time (mean of 3.765 and Std of 1.673) though the sentiments were very much contested as shown by a standard deviation above 1.0; they got after sale

service from manufacturers and suppliers annually (mean of 3.218 and Std of 1.097) though the sentiments were very much contested as shown by a standard deviation above 1.0; the suppliers failed to honour the orders issued (mean of 3.456 and Std of 1.543) though the sentiments were very much contested as shown by a standard deviation above 1.0; the suppliers offer credit facilities to the organization; they recognized contributions and accomplishments of the suppliers (mean of 3.331 and Std of 1.909) though the sentiments were very much contested as shown by a standard deviation above 1.0; they resolved immediate problems that would disrupt the work (mean of 3.782 and Std of 1.652) though the sentiments were very much contested as shown by a standard deviation above 1.0. The recognized contributions and accomplishments of the suppliers and manufacturers (mean of 3.902 and Std of 1.563) though the sentiments were very much contested as shown by a standard deviation above 1.0. The study findings were in agreement with literature review by Ansari (2009) that manufacturer and supplier management allowed firms to make better use of their suppliers’ capabilities and coordinating operational activities through joint planning also results to inventory reduction, smoothing production, improve product quality, and lead time reduction.

Table 3: Manufacturer and Supplier Collaboration

Manufacturer and Supplier Collaboration	Mean	Std. Dev
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We do appraise the manufacturers and suppliers annually.	3.335	1.909
We ensure the manufacturers and suppliers are paid in time	3.765	1.673
We do get after sale service from manufacturers and suppliers annually	3.218	1.097
Our manufacturers and supplier fail to honour the orders issued	3.456	1.543
Our manufacturers and suppliers offer credit facilities to the organization.	3.331	1.909
Resolve immediate problems that would disrupt the work.	3.782	1.652
Recognize contributions and accomplishments of the suppliers and manufacturers.	3.902	1.563

Supply Chain Forecasting

The study sought to establish the extent to which respondents agreed with the statements relating to whether supply chain forecasting influence implementation of inventory procurement practices Kenya. On a scale of 1-5, the scores were as follows: The scores “Very small extent=VSE” and “Small extent=SE” were represented by mean score, equivalent to 1 to 2.5 on the continuous Likert scale ($1 \leq \text{Small extent} \leq 2.5$). The scores of ‘Moderate extent=ME’ were represented by a score equivalent to 2.6 to 3.5 on the Likert scale ($2.6 \leq \text{Moderate extent} \leq 3.5$). The score of “Great extent=GE” and “Very great extent=VGE” were represented by a mean score equivalent to 3.6 to 5.0 on the Likert Scale ($3.6 \leq \text{Great extent} \leq 5.0$). The results were presented in mean and standard deviation as illustrated in Table 4.

As indicated by high levels of agreement, a majority of respondents affirm that they have the correct forecasting methods thus reduction of stock outs in the organization (mean of 3.214 and Std of 1.223) though the sentiments were very much contested as shown by a standard deviation above 1.0.; The original equipment manufacturer was used to predict demand beyond a 4 week horizon (mean of 3.672 and Std of 1.675) though the sentiments were very much contested as shown by a standard deviation above 1.0; The forecasting accuracy demonstrate

improvements and related observations results in inventory markdowns (mean of 3.333 and Std of 1.000) though the sentiments were very much contested as shown by a standard deviation above 1.0; The organization has advanced forecasting tools that can enable improvements in cost reduction (mean of 3.900 and Std of 1.237) though the sentiments were very much contested as shown by a standard deviation above 1.0. The organization has advanced forecasting tools that can enable improvements in cost reduction (mean of 3.678 and Std of 1.380) though the sentiments were very much contested as shown by a standard deviation above 1.0. The forecasting tool accuracy tools synchronizes the supply and demand cycle than the use of real time information (mean of 3.678 and Std of 1.380) though the sentiments were very much contested as shown by a standard deviation above 1.0.; Having years of demand data helps the organization to better predict future demand thus timely purchases-stock out reduction (mean of 3.009 and Std of 1.673) though the sentiments were very much contested as shown by a standard deviation above 1.0. The study findings are in agreement with literature review by Boyle et al. (2008) that where original equipment manufacturers (OEM) could not predict demand beyond a 4 week horizon. Moon et al. (2010) presented demand forecasting demonstrating improvement in forecasting accuracy and related observations resulted in inventory markdowns.)

Table 4: Supply Chain Forecasting and Implementation of Inventory Management Practices

Supply Chain Forecasting	Mean	Std. Dev
We have the correct forecasting methods thus reduction of stock outs in the organization	3.214	1.223
The original equipment manufacturer is used to predict demand beyond a 4-week horizon	3.672	1.675
The forecasting accuracy demonstrate improvements and related observations results in inventory markdowns	3.333	1.000
The organization has advanced forecasting tools that can enable improvements in cost reduction	3.900	1.237
The forecasting tool accuracy tools synchronizes the supply and demand cycle than the use of real time information	3.678	1.380
Having years of demand data helps the organization to better predict future demand thus timely purchases-stock out reduction	3.009	1.673

Implementation of Inventory Management Practices

On the extent to which implementation of inventory management practices, respondents were asked to indicate the extent to which the factors determined the implementation of inventory management practices. The data was collected from the different indicators of the variable implementation of inventory management practices which was ordinal categorical. The data was therefore presented in frequency tables with the median being used as the appropriate measure of central tendency. The results were presented in table 5. The first indicator for the dependent was lead time reduction was, 0% of the respondents had 0-20%, 3% had 20-30%, 11% had 30-40%, 17% had 40-50%, 69% had had over 50%. The modal class is of the respondents who had over 50% lead time reduction. The mode was found to be 5 which imply that on average the organizations level of lead time reduction is over 50%. The next indicator required the respondents to state the level of minimization of procurement expenditure in the organization, 3% of the respondents had 0-20%, 3%

had 20-30%, 14% had 30-40%, 26% had 40-50%, 49% had over 50%. The modal class is of the respondents who had over 50%. The mode was found to be 5 which imply that on average firm's levels of minimization of procurement expenditure was by over 50%. When the respondents were asked what the level of order fulfilment was, 0% of the respondents had 0-20%, 3% had 20-30%, 3% had 30-40%, 34% had 40-50%, 60% had over 50%. The modal class is of the respondents who had over 50% level of order fulfilment. The mode was found to be 5 which imply that on average the level of order fulfilment in the manufacturing firms is over 50%. Finally, the respondents were asked what the level of Quality of procured goods and services offered was, 0% of the respondents 0-20%, 3% had 20-30%, 20% had 30-40%, 43% had 40-50%, 34% had over 50%. The modal class is of the respondents who had between 40-50% quality level. The mode was found to be 4 which implied that on average the level of Quality of procured goods and services offered was between 40-50%.

Table 5: Implementation of Inventory Management Practices

Statement	0%- 10%	10%- 20%	20%- 30%	40%- 50%	Over 50%	Mode
What is the level of lead time reduction?	0	3	11	17	69	5
What is the level of minimization of procurement expenditure?	3	3	14	26	49	5
What is the level of order fulfilment in the firm?	0	3	3	34	60	5
What is the level of quality of procured goods and services offered?	0	3	20	43	34	4

Multiple Regression Analysis

The study adopted a multiple regression analysis so as to establish the relationship of independent variables and dependent variable. The study applied SPSS to code, enter and compute the measurements of the multiple regression analysis. According to the model summary Table 6, the coefficient of determination (R^2) was used to measure how far the regression model's ability to explain the variation of the independent variables. The coefficient of determination was between zero and one. The data showed that the high R square was 0.620. It showed

that the independent variables in the study were able to explain 62.00% variation in the implementation of inventory management practices in fast moving consumer goods manufacturing firms in Nairobi County, Kenya. The remaining 38% was explained by the variables or other aspects outside the model. This implied that these variables were very significant and they therefore needed to be considered in any effort to boost implementation of inventory management practices in fast moving consumer goods manufacturing firms in Nairobi County, Kenya.

Table 6: Model Summary

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	.788	.620	.588	.003

Analysis of Variance (ANOVA)

The study further used Analysis of Variance (ANOVA) in order to test the significance of the overall regression model. Green and Salkind (2013) posit that Analysis of Variance helps in determining the significance of relationship between the research variables. The results of Analysis of Variance (ANOVA) revealed that the significance of the F-test was done to test the effect of independent variables on the dependent variable simultaneously. The F-statistic test basically showed whether all the independent variables included in the model jointly

influenced on the dependent variable. Based on the study results of the ANOVA Test or F-test in Table 7, obtained F-count (calculated) value was 42.212 greater the F-critical value (table) (12.452) with significance of 0.001. Since the significance level of $0.001 < 0.05$ we concluded that the set of independent variables affected the implementation of inventory management practices in fast moving consumer goods manufacturing firms in Nairobi County, Kenya (Y-dependent variable) and this showed that the overall model was significant. Thus, the four variables played a significant role in the implementation of inventory management practices

in fast moving consumer goods manufacturing firms

in Nairobi County, Kenya.

Table 7: ANOVA (Results)

Model	Sum of Squares	d.f	Mean Square	F	Sig.
Regression	24.8902	4	6.2225	42.215	.003
Residual	10.908	74	.1474		
Total	11.914	78			

NB: F-critical Value = 12.452;

The results of multiple regression analysis obtained regression coefficients t value and significance level as indicated in Table 8. The study conducted a multiple regression analysis so as to determine the relationship between the dependent variable and independent variables. The general form of the equation was to predict the implementation of inventory management practices in fast moving consumer goods manufacturing firms from volume of purchases, procurement outsourcing strategies, manufacturer/supplier collaboration is: $(Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \epsilon)$ becomes: $Y = 12.662 + 0.688X_1 + 0.566X_2 + 0.532X_3 + 0.480X_4 + 4.358$. From the study findings on the regression equation established, taking all factors into account (independent variables) constant at zero implementation of inventory management practices in fast moving consumer goods manufacturing firms was 12.662. The data findings analyzed also showed that taking all other independent variables at zero, a unit increase in volume of purchases would lead to a 0.688 increase in implementation of inventory management practices in fast moving consumer

goods manufacturing firms; a unit increase in procurement outsourcing strategies would lead to a 0.566 increase in implementation of inventory management practices in fast moving consumer goods manufacturing firms, a unit increase in manufacturer/supplier collaboration led to 0.532 increase in implementation of inventory management practices in fast moving consumer goods manufacturing firms and a unit increase in supply chain forecasting led to 0.480 increase in implementation of inventory management practices in fast moving consumer goods manufacturing firms. This inferred that volume of purchases contributed most to implementation of inventory management practices in fast moving consumer goods manufacturing firms. Based at 5% level of significance, volume of purchases had a .003 level of significance; procurement outsourcing strategies showed a .007 level of significance, manufacturer/supplier collaboration show a .010 level of significance and supply chain forecasting show a .021 level of significance hence the most significant factor was volume of purchases.

Table 8: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	β	Std. Error	β		
(Constant)	12.662	4.358		2.905	.000

Volume of Purchases		.688	.176	.665	3.908	.003
Procurement Practices	Outsourcing	.566	.181	.654	3.124	.007
Manufacturer and Supplier Collaboration		.532	.195	.455	2.122	.010
Supply Chain Forecasting		.480	.240	.332	2.075	.021

CONCLUSION AND RECOMMENDATIONS

Conclusions

The study revealed that respondents were aware of existing criteria of setting up purchase volumes which was based on usage, urgency and perishability of the item. A further regression analysis test of association revealed a close association between the purchase volumes guidelines and the level of implementation of inventory management practices. The respondents further affirmed that: purchasing in volumes lowers costs, contributes to continuous innovation and improvement and gives the firm competitive advantage.

Additionally, the study established that manufacturer and supplier collaboration influence implementation of inventory management practices in manufacturing firms in Kenya. Further, the study revealed that the variable statistically and strongly correlated to implementation of inventory management practices in manufacturing firms. The regression coefficients of the study show that manufacturer and supplier collaboration has a significant influence on implementation of inventory management practices in manufacturing firms. This shows that manufacturer and supplier collaboration has a positive influence implementation of inventory management practices in manufacturing firms.

Further, the study established that procurement outsourcing strategies influence implementation of

inventory management practices in manufacturing firms in Kenya. Further, the study revealed that the variable statistically and strongly correlated to implementation of inventory management practices in manufacturing firms. The regression coefficients of the study show that procurement outsourcing strategies has a significant influence on implementation of inventory management practices in manufacturing firms. This shows that procurement outsourcing strategies has a positive influence on implementation of inventory management practices in manufacturing firms.

Finally, the study established that supply chain forecasting influence implementation of inventory management practices in manufacturing firms in Kenya. Further, the study revealed that the variable statistically and strongly correlated to implementation of inventory management practices in manufacturing firms. This shows that procurement outsourcing strategies has a positive influence on implementation of inventory management practices in manufacturing firms.

Recommendations of the Study

The study recommended that there was need for setting up purchase volumes which is based on usage, urgency and perishability of the item. The purchase volumes guidelines and the level of implementation of procurement practices need to be well articulated. The: purchasing in volumes lowers costs, contributes

to continuous innovation and improvement and gives the organization competitive advantage.

The study established that procurement outsourcing strategies plays a significant role on the implementation of inventory management practices in manufacturing firms. The study recommends that the service providers can be used to always to offer a competitive cost thus cost reduction in the organization. The outsourcing can always to free up cash thus allowing investments on core activities and improves organization focus. It can free management time and reduces staff costs as well as giving organization flexibility.

The study recommended for the adoption of supply chain forecasting enhancing implementation of inventory management practices in manufacturing firms. There is need the organization to have the correct forecasting methods thus reduction of stock outs in the organization. The forecasting accuracy can be improved and related observations results in inventory markdowns. The organization should adopt forecasting tools that can enable improvements in cost reduction. Having years of demand data helps the organization to better predict future demand thus timely purchases-stock out reduction.

The study recommended for the enhancement of manufacturer and supplier collaboration plays a significant role on the implementation of inventory

management practices in manufacturing firms. The study recommended for the appraisal of manufacturers and suppliers annually and they ensure the suppliers are paid in time. The suppliers were recommended to honour the orders issued and the suppliers offer credit facilities to the organization. They should recognize contributions and accomplishments of the suppliers and do resolve immediate problems that would disrupt the work.

Areas for Further Research

Due to constraints highlighted, this study could not exhaust all the determinants of implementation of inventory management practices in the fast moving consumer goods manufacturing firms in Kenya. The four independent variables that were studied explained 62.00% of the implementation of inventory management practices in the fast moving consumer goods manufacturing firms in Kenya. Therefore other determinants of implementation of inventory management practices in the fast moving consumer goods manufacturing firms in Kenya need to be established. A review of literature indicated that there has been limited amount of research on the implementation of inventory management practices in the Kenyan context. Thus, the findings of this study serve as a basis for future studies on the role of independent variables studied on implementation of inventory management practices in the fast moving consumer goods manufacturing firms in Kenya.

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