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**INVENTORY MANAGEMENT SYSTEMS ON SUPPLY CHAIN PERFORMANCE OF
FAST-MOVING CONSUMER GOODS MANUFACTURERS IN KENYA**

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INVENTORY MANAGEMENT SYSTEMS ON SUPPLY CHAIN PERFORMANCE OF FAST-MOVING CONSUMER GOODS MANUFACTURERS IN KENYA

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Abstract

Purpose: The purpose of this study was to determine the influence of inventory management systems on supply chain performance of fast-moving consumer goods manufacturers in Kenya

Methodology: The study adopted descriptive research design. The unit of observation was the operations manager of the 51 FMCG manufacturers located in Nairobi. The sampling frame of the current study consisted of operations managers in the manufacturers of the FMCGs in Nairobi. The study used the census method to select 51 manufacturers of the FMCGs in Nairobi, thus the sample of the study was 51 respondents. Primary data was used in the study. The study used questionnaires to collect data. Mixed methods technique of analyzing data was used where both descriptive and inferential analysis were used. The data collected from the field was analyzed using SPSS 23 program. The questionnaires were referenced and the items in them coded for easier data entry. The presentation of the findings was done using tables.

Results: The study found that inventory management systems positively and significantly influences Supply chain performance of FMCG in Kenya. The study found that respondents agreed that inventory management systems promotes improved supplier, vendor, and partner relationships; inventory management systems enables the company to maintain a centralized record of every asset; inventory management systems helps in reduction in storage costs; inventory management systems helps to keep track on current stock levels which enables the company to reorder with greater accuracy; and that inventory management systems promotes better reporting and forecasting capabilities.

Unique contribution to theory, practice and policy: The study recommended that the recommends the company to adopt new technology (updated inventory management system) to ensure that the processes in the company are efficient; this can be achieved by upgrading operation standards and implementation of new technology and software. Because of technological itches, it is possible for the company to lose data, therefore it is recommended that the company should always have backup of inventory data.

Key words: *Inventory Management Systems, Supply Chain Performance, Fast-Moving Consumer Goods*

1.0 INTRODUCTION

Inventory refers to the total amount of material/commodity that is contained in a warehouse at any particular time. It could be the total amount of commodity and the action of counting them (Wisner et al., 2012). Tracking as well as management of commodities relate with systems of managing inventory and they include monitoring commodities that are moved into and out of the warehouse and reconcile with inventory balanced electronically. The role played by inventory management is very important in providing efficient health care related to the three important aspects of medical supplies applied in health facilities which are availability, affordability and safety. In the organization, all policies on inventories should be beneficial in driving operational period, expenses and work the requirements of capital (Cox, 2010).

Miller (2010) indicated that management of inventory is inclusive of all activities that are put in place to make sure that customers have the products and services they need. It is responsible for coordination of purchases, manufacturing and distribution functions to meet the needs of marketing and those of the organization in order to avail the products and services needed by customers. Management of inventory is involved primarily with specifying size and placement of goods that have been stocked. Management of inventory is needed in various locations in the faculty or various locations of supply network for protecting the regular and planned production from materials depletion. Inventory management scope also involves managing replenishing lead time, returns, goods and defected goods and predicting of demand, carrying inventory costs, manage asset, physical inventory, availability of physical space, valuation and visibility of inventory, predicting the future price of inventory and management of quality. It is possible to reach the optimum inventory level by balancing all the needed requirements, which is a continuous process (Ogbo & Onekanma, 2014).

Osei-Mensah (2016) carried out a study to assess the impacts of practices of managing inventories on delivery of service at St. Martin's Catholic Hospital. Research design applied was descriptive and a sample of 60 employees was used. Questionnaire was the selected data collection tool. From the findings, it was established that hospitals make sure that agreements made with suppliers for short cycle deliveries predict accurately the dates for supplies to be delivered and operating Materials Requirements Planning system (MRP). It was also found that hospitals make sure that as a way of managing inventories they partner with strategic supplier and applies strict the use of IT in its practices of managing inventories.

Atnafu and Balda (2018) studied effects of practices of managing inventories on competitiveness of organizations as well as their performance: Empirical evidence from Ethiopia's MSEs. The focus of the study was examining empirically the effects of practices of managing the inventory on competitiveness of organizations and their performance. A sample of 188 MSEs was used in the study; the sample was selected from organizations that operated in manufacturing sub-sector and the association and hypothesis were tested with the use of SEM. It was found that increased levels of practices of managing inventories can result to improved competitive advantage and performance of the organization. It was also found that competitive advantage has a positive effect on performance of the organization.

Mwangi (2013) studied management of inventories and performance of SC of NGOs in Kenya's agricultural industry. It was found that practices of managing inventories were significantly related with performance of SC. It was also found that 73.2% variation in performance of SC could be attributed to EOQ, JIT, order batching, marginal analysis, inventory of vendor managed, ABC analysis and simulation. The study also found that in order for the organization to attain high level of performance in its C it is important for them to encourage the following practices: close relationship with customers and partners, suppliers prequalification, holding safety stock, tools for e-procurement, JIT, stringent agreements on grant and knowledge regarding techniques of managing inventories.

Organization performance is described as the way in which a firm accomplishes its market-based objectives and additionally its financial objectives (Cheshire & Kombo, 2015). Performance is an ongoing process and flexible procedure which includes manager and those they manage. They take a role of partners in a system created to empower them accomplish the required outcomes. Practicing strategic management can be supported as long as it enhances the firm's performance. Performance in itself is the final product of the activities that it incorporates and the actual outcome of the strategic administration process. Organizational performance is attainment of ultimate goals of the organization as set out in the key Organizational plans (Wheelen & Hunger, 2013).

Organization performance is a multidimensional construct operationalized by a variety of financial measures (which include sales, value of net assets and profit) and non-financial measures which include number of workers, market share and overall customer satisfaction. In addition, factors such as overall satisfaction and non-financial goals of the firms are also very important in evaluating performance. Organization performance cannot be adequately determined without considering both financial and nonfinancial measures (Alder, 2012).

According to Cheshire and Kombo (2015), organizational performance comprises of three distinct areas of company results: Financial performance, commodity market performance and shareholder return. Harzing (2013) noted that an organization performance may essentially be a reflection of changes in the market size or financial conditions rather than sales figures alone. A company's performance in respect to competitors can be measured by its share in the market. Firms try to build their business with respect to competitors essentially expanding their share in the market to profit from the economies of scale. Economies of scale can contribute in working up a cost advantage. Sales increase in a slow industry is the inspiration to enlarge the market share.

Fast-Moving Consumer Goods Manufacturers (FMCG)

FMCG are the products that sell very fast without incurring a high cost. They can also be defined as the essential or nonessential goods that are purchased frequently (Mandrinos, 2014). There is a wide range of products that are classified as FMCGs, which include soaps, shaving products, toiletries, detergents, soft drinks, processed foods, consumables, glassware, batteries, cosmetics, and plastic goods among others (Wasonga, 2012). The shelf life of FMCG products is very short. Their short shelf life is partly attributed to the fact that most of these products are perishable and get bad rapidly. For instance, FMCGs such as fruits, meat, baked goods, and vegetables are

highly perishable. From the marketers' point of view, FMCG also has extensive distribution network (Nyaga, 2014).

The distribution chain for FMCG is the interdependent collection of processes and related resources. They include manufacturers, warehouses, suppliers, logistics service providers, wholesalers and distributors and all the other parties within the supply chain network. The Kenya's FMCG has been experiencing faster growth in the last few decades. The growth of the industry has resulted in many companies, both local and foreign entering the industry to take a share of the market (Wasamba, 2008). Currently, there are many FMCG manufacturing companies in Kenya based in Nairobi. Some of the companies are Interconsumer Limited, Bidco Oil Refineries, Kapa Oil, Finlay, Kenya Seed Company, Kenya Nut Company, Dawa Group, Maisha Flour Mills, Melvin Marsh International, Nestle Foods Kenya, Eveready East Africa, Premier Food Industries, Proctor & Allan (E.A), Coca-Cola, PepsiCo, Ramzco, and HACO Industries (K) among many others (Njambi & Katuse, 2013). These among other companies manufacture a variety of FMCG that is sold both locally and internationally.

Currently, Bidco is the largest FMCG in Kenya commanding about 24% of Kenya's oil and fat products (Euromonitor, 2015). In this segment of the FMCG, they are followed by Kapa Oil Refineries that controls about 12% of the market share while Unilever Kenya comes third with 9% with the ranking done according to production capacity (Euromonitor, 2015). Like in other countries, some of the former Kenyan FMCG giants are facing hard times due to increased competition and technological advancements that have rendered some of the products obsolete (Wasonga, 2012). There is also a challenge with complex logistics management especially due to the high distribution network at a faster speed. For instance, Eveready East Africa, which was once a leader in FMCG in Kenya, collapsed and exited the Kenyan market due to high costs and poor performance (KAM, 2017).

1.1 Unified Theory of Logistics

This theory was developed by Mentzer, Min and Michelle (2004). This theory proposes that the main objective of competitive advantage in a company is creating value to its customers to satisfy the final user. Based on reviews of theories relating to companies, it was established that the role of logistics is to create a boundary spanning, coordinate capabilities of demand and supply needed by the company to create value and satisfy their customers. Logistic contribution of a company towards competitive advantage is significant in regard to efficiency and effectiveness. Some of the logistics capabilities that lead to competitive edge are management of demand interface which include the quality of logistics and service to customer, management of supply interface which include low cost of distribution and supply, and management of information capabilities which involves information sharing through IT ad connectivity.

There is another important role that is performed by logistics capabilities that is in relation to spanning of boundary interface between internal function area and focal company and SC partner. With coordination of the marketing function, logistics have the ability of differentiating product and services and offer fulfillment of requirement of customers (Mentzer *et al.*, 2004). When combined with production, logistics provide reduction in cost and investment and maintain the level of service. Through logistics capabilities, organizations are assisted in

cooperating with partners of SC including distributors, suppliers and other intermediaries in order to coordinate flow of supply and demand for the purpose of delivering value to clients and in return share benefits. Therefore, logistics is an integral part of wider concept of SCM.

FMCG Manufacturers logistics, particularly in-store logistics operations, determine for a large part the interaction between a customer and the retail services cape (Samli *et al.*, 2015) leading to evaluation of cognition of the service (Sandstrom, Edvardsson, Kristensson & Magnusson, 2008). It is possible for FMCGs manufacturers to differentiate what they offer if the streamline what their clients experience as they shop and make sure that their customers are satisfied with their services and are able to conveniently use their services (Sandstrom *et al.*, 2008). This study used the Unified Theory of Logistics to determine the influence of inventory management systems on SC of FMCG manufacturers in Kenya. The theory suggests the use of inventory management systems to improve organization's supply chain.

1.1 Statement of the Problem

Under logistical supply chains, speed is of the essence hence the time from picking to delivery of outputs to customer's point of collection is very critical when it comes to quality customer service and satisfaction. It is the responsibility of logistic managers manning supply chains to ensure that both inputs and outputs get to where they are required within the shortest time and in the right quantity in order to satisfy customer's needs. According to statistics, it is estimated that in Kenya, 90% of logistic related processes in companies are done manually (Miheo, 2013). Mitullah and Odek (2010) indicate that a significant number of firms in Kenya are still lagging behind in the use of information technology incorporation in logistics management. KAM (2017) states that it is disturbing to witness decline in performance and states that eroded competitiveness and compromise for the aspiration of the government of up to 20% of growth which could enable Kenya to be prosperous.

Kenya is Africa's second biggest formalized retail economy after South Africa; 30% of Kenyans do their shopping in retail outlets hence boosting the FMCGs. There is hence potential for the FMCGs manufacturers in Kenya, but, in the recent times, some FMCGs manufacturers like Cadbury Kenya did shut down its plant in Nairobi because of its poor performance (RoK, 2014) while others such as Eveready found it hard to cope in the Kenyan market and have seen their net profit fall by 58.7 per cent (Kandie, 2014). With Fast Moving Consumer Goods having a short lifespan which can lead to increased wastage and loss of goods on transit due to ready market there is a need for effective logistics management such as adoption of logistics management systems which can enhance supply chain performance.

This study sought to fill some of the existing knowledge gaps in studies by Wacuka (2015) who investigated the relationship between inventory management control and supply chain performance of FMCG, Wambui (2015) who focused on the relationship between lean management practices and SC performance of FMCG as well as Onyango (2017) who focused on the relationship between inventory management practices and performance of FMCG in Nairobi County. These studies have focused on FMCG but have not linked inventory management systems to its performance.

2.0 METHODOLOGY

The study adopted descriptive research design. The unit of observation was the operations manager of the 51 FMCG manufacturers located in Nairobi. The sampling frame of the current study consisted of operations managers in the manufacturers of the FMCGs in Nairobi. The study used the census method to select 51 manufacturers of the FMCGs in Nairobi, thus the sample of the study was 51 respondents. Primary data was used in the study. The study used questionnaires to collect data. Mixed methods technique of analyzing data was used where both descriptive and inferential analysis were used. The data collected from the field was analyzed using SPSS 23 program. The questionnaires were referenced and the items in them coded for easier data entry. The presentation of the findings was done using tables.

3.0 RESULTS

3.1 Inventory Management Systems

From the findings presented in Table 1, the respondents agreed that inventory management systems promotes improved supplier, vendor, and partner relationships ($M=3.979$, $SD=0.707$); inventory management systems enables the company to maintain a centralized record of every asset ($M=3.957$, $SD=0.624$); inventory management systems helps in reduction in storage costs ($M=3.957$, $SD=0.721$); inventory management systems helps to keep track on current stock levels which enables the company to reorder with greater accuracy ($M=3.894$, $SD=0.667$); and that inventory management systems promotes better reporting and forecasting capabilities ($M=3.830$, $SD=0.816$). The study findings agrees with the findings of Atnafu and Balda (2018) that increased levels of practices of managing inventories can result to improved competitive advantage and performance of the organization. It was also found that competitive advantage has a positive effect on performance of the organization.

Respondents explained the challenges faced in the use of technology to manage inventory practices. There is the challenge of inefficient process; despite the advancement in technology, most of the companies still use inventory management systems that are outdated. This can be mitigated by upgrading operation standards and implementation of new technology and software. Losing of inventory data is a common challenge that most organizations face. This challenge can however be mitigated by having a backup of the inventory data. There will always be issues even if the company has the most updated inventory management system. Therefore, there is need for transparency; if a customer is aware that there are some delays, they will change their expectations. Therefore communication and transparency is key to customer confidence and loyalty with the company. Another challenge with inventory management is increased competition. There are emerging economies like China and India and they provide advantage like cheap labour cost, and material cost. With international shipping available, it is necessary to make sure that company's supply chain is efficient.

Table 1: Inventory Management Systems on Performance of Supply Chain

Statement	1	2	3	4	5	Mean (M)	Std. Dev.(SD)
Inventory management systems promotes improved supplier, vendor, and partner relationships	1	1	1	40	4	3.979	0.707
Inventory management systems enables the company to maintain a centralized record of every asset	1	1	3	35	7	3.957	0.624
Inventory management systems helps in reduction in storage costs	1	2	1	37	5	3.957	0.721
Inventory management systems helps to keep track on current stock levels which enables the company to reorder with greater accuracy	1	1	4	37	4	3.894	0.667
Inventory management systems promotes better reporting and forecasting capabilities	2	1	5	34	5	3.830	0.816

3.2 Regression Analysis

The sought to determine the influence of inventory management systems on supply chain performance of fast-moving consumer goods manufacturers in Kenya. The regression model for this equation was $Y = \beta_0 + \beta_2 X_2 + \varepsilon$.

From the finding presented in table 2, the value of adjusted R^2 was 0.616 which implies that 61.6% of variations in supply chain performance can be attributed to changes in inventory management systems. The remaining 38.4% variations in supply chain performance can be attributed to other aspects other than change in inventory management system. The findings also show that inventory management system and supply chain performance are strongly and positively relates as indicated by a correlation coefficient (R) value of 0.790.

From the Anova findings, the p-value obtained was 0.000 which is less than 0.05, an indication that the model was significant. The findings also show that the f-calculated value was 74.713 which is greater than the F-critical value ($F_{1,45}=4.057$). Since the f-calculated value is greater than the f-critical value it shows that inventory management system is reliable and can be used to predict supply chain performance in fast moving consumer goods companies in Nairobi.

From the coefficients table, the following model was fitted;

$$Y = 1.978 + 0.371 X_2 + \varepsilon$$

From the equation above, when inventory management system is held to a constant zero, performance of supply chain will be at a constant value of 1.978. The findings also show that a unit increase in inventory management system will lead to a 0.371 increase in supply chain performance in FMCG in Nairobi. The findings also show that the t-statistic (8.644) has a p-value (0.000) which is less than the selected level of significance (0.05). Therefore we accept the second null hypothesis (H_{A2}) and conclude that inventory management systems positively influences supply chain performance of Fast Moving Consumer Goods manufacturers in Kenya.

Table 2: Regression Analysis for Inventory Management Systems

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.790 ^a	.624	.616	.10914		
a. Predictors: (Constant), Inventory Management Systems						
ANOVA^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	.890	1	.890	74.713	.000 ^b
1	Residual	.536	45	.012		
	Total	1.426	46			
a. Dependent Variable: Supply Chain Performance						
b. Predictors: (Constant), Inventory Management Systems						
Coefficients^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	1.978	.091		21.748	.000
1	Inventory Management Systems	.371	.043	.790	8.644	.000
a. Dependent Variable: Supply Chain Performance						

4.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The study found that respondents agreed that inventory management systems promotes improved supplier, vendor, and partner relationships; inventory management systems enables the company to maintain a centralized record of every asset; inventory management systems helps in reduction in storage costs; inventory management systems helps to keep track on current stock levels which enables the company to reorder with greater accuracy; and that inventory management systems promotes better reporting and forecasting capabilities. The study also identified challenges faced in the use of technology to manage inventory practices. There is the challenge of inefficient process; despite the advancement in technology, most of the companies still use inventory management systems that are outdated. Losing of inventory data is a common challenge that most organizations face. This challenge can however be mitigated by having a backup of the inventory data. There will always be issues even if the company has the most updated inventory management system. Therefore communication and transparency is key to customer confidence and loyalty with the company. Another challenge with inventory management is increased competition. There are emerging economies like China and India and they provide advantage like cheap labour cost, and material cost. With international shipping available, it is necessary to make sure that company's supply chain is efficient.

Conclusion

The study found that inventory management systems have significant relationship with Supply chain performance. The study further found that the influence of inventory management systems on supply chain performance is seen to be positive. Therefore improvement in Inventory management systems will result to an increase in supply chain performance of fast-moving consumer goods manufacturers in Kenya. Based on the findings, the study concluded that inventory management systems positively and significantly influences Supply chain performance of FMCG in Kenya.

Recommendations

Improving inventory management results to improved supply chain performance in the company. The study therefore recommends the company to adopt new technology (updated inventory management system) to ensure that the processes in the company are efficient; this can be achieved by upgrading operation standards and implementation of new technology and software. Because of technological itches, it is possible for the company to lose data, therefore it is recommended that the company should always have backup of inventory data. Further, the company should ensure they are transparent with their customers to avoid losing them to other competitors especially emerging economies like China and India.

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