International Journal of Innovative Research and Advanced Studies (IJIRAS)
Volume 4 Issue 4, April 2017

ISSN: 2394-4404

Influence Of Innovations On Supply Chain Performance In Retail Sector: A Case Study Of Nakumatt Holdings Supermarket

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Abstract: ***The adoption of innovation has been necessitated by the rapid change in technology. The quest for competitive advantage has always compelled firms to adopt innovation in supply chain management. Supply chain operations have also been hampered by an increasing number of natural and manmade disruptions. Coupled with an increasing global reach and product complexity, firms are finding it tough to provide innovative products and services to their customers. The general objective of the study was to determine the effects of innovations on the performance of Supply Chain of Nakumatt Holdings supermarket, Kenya. The specific objectives of the study were to establish the influence of warehouse management system on supply chain performance in Nakumatt Holdings supermarket, to determine the effect of material resource planning on supply chain performance in Nakumatt Holdings supermarket, to examine the influence of enterprise resource planning on supply chain performance in Nakumatt Holdings supermarket and to find out the effect of Vendor managed inventory on supply chain performance in Nakumatt Holdings supermarket.The research reviewed theories and empirical studies that explain the relationship between innovation adoption and supply chain performance. This included Transaction Cost Economics (TCE) theory, Resource Based View theory, and Theory of Technology Acceptance which are theories governing the adoption of innovation in organizations. The Target population in this study was Nakumatt holdings Supermarket four branches in Nairobi County. Primary data was collected using questionnaires. The data that was collected related to the level of innovation adapted, influence of warehouse management system, material resource planning, enterprise resource planning, and vendor managed inventory on supply chain performance in Nakumatt Holdings supermarket. Data analysis was done using Statistical Package for Social Sciences (SPSS) version 24 where inferential statistics was applied and multiple regressions employed to test the relationship between innovation and the supply chain performance of Nakumatt holding Supermarket.***

I. INTRODUCTION

A. BACKGROUND TO THE STUDY

The quest for competitive advantage has always compelled firms to adopt innovation in supply chains management. Supply chain operations have also been hampered by an increasing number of natural and manmade disruptions. Coupled with an increasing global reach and product complexity, firms are finding it tough to provide innovative products and services to their customers (Lee et al., 2007). Innovation has redefined supply chain management in many retail firms by adopting new ways to store, process, distribute and exchange information both within companies and with customers and suppliers in the supply chain. Innovation technologies such as Vendor Managed Inventory (VMI) and Collaborative Planning, Forecasting and Replenishment (CPFR) are based on an increased level of automation in both the flow of physical materials and goods and the flow of information between companies to improve

the efficiency in the entire supply chain (Daugherty et al., 2009).

As dynamic resources, supply chain innovations influence the transformation of raw materials into finished goods, reduces costs and lead-time, improved quality and on-time delivery, and subsequently firm success (Prasad & Heales, 2010). Innovation also facilitates communication, real-time information sharing, as well as reduced costs of inventory and transaction (Prajogo & Olhager, 2012). The use of innovations allows suppliers, manufacturers, distributors, retailers, and customers to reduce lead time, paperwork, and other unnecessary activities. It is also mentioned that managers will experience considerable advantages with its use such as the flow of information in a coordinated manner, access to information and data interchange, improved customer and supplier relationships, and inventory management not only at the national level but also internationally (Handfield & Nichols, 2014). Turner (2010) indicates that firms cannot effectively manage cost, offer high customer service, and become leaders in supply chain management without the incorporation of top of-the-line innovations.

The changing business environment and technology advancements increased the level of competition and also the need for innovation for survival and growth. Innovation can be focused on cost improvements, process improvements, product or service line extensions, new uses/reuse, new markets and customers or new technologies (Das and Nair, 2010).

Christmann (2000) suggested that the organizations having capabilities for process innovation and implementation will be leaders in sustainability. Storer and Hayland (2009) proposed that like the firm, the supply chain also should use innovation to provide unique value adding solutions for the supply chain that provides a market competitive advantage. Employing a supply chain's innovation capacity indicates the willingness of groups of actors within the supply chain to take steps, or perform activities that ultimately produce output that improves or changes current activities to meet a market need or new trajectory (Storer & Hyland, 2009). The introduction of new products and services, or entry into new markets, is likely to be more successful if accompanied by innovative supply chain designs, innovative supply chain management practices, and enabling technology (Stentoft *et al.*, 2011).

Currently, retail is one of the biggest employers in the world and a large portion of the world economy. The retail industry is a sector of the economy that is comprised of individuals and companies selling finished products to end user consumers. The retail market in Africa is still in its infancy in most states except in North and South Africa where Egypt and South Africa are leading in terms of sales volumes and branch networking. According to the bureau of market research of South Africa the retail sector is sophisticated and supplied by both local and imported products. The bureau puts the total retail sales of 2010 at 41.12M Dollars of which 30% represents food sales. In Kenya there are four major players in the market namely: the Nakumatt holdings Limited, the Tusker Mattresses Limited, Uchumi supermarkets limited and Naivas Supermarket Limited. There're also over one hundred small but upcoming supermarkets. The industry is fiercely competitive.

a. INNOVATION

According to Rogers (1995) innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption. Innovation is considered as an effective way to improve firm's productivity due to the resource constraint issue facing a firm (Capon, 1990). According to Chaminade and Vang (2006), innovation involves the design, the development and the implementation of innovative instruments and processes, and the formulation of creative solutions to problems in an organization. This definition was adopted for the purpose of this study. Lehtimaki (1991) believes that innovation is an essential element for economic progress of a country and competitiveness of an industry. Susman et al. (2006), argues that innovation is one of the most important competitive weapons and generally seen as a firm's core value capability.

Firms are constantly thriving to develop and test new ideas, products and services. Mainly for service industries, supply chain innovation is required for ensuring effective service delivery (Chapman et al., 2003). According to Disney and Towill (2008), global retail outlets such as Wallmatt, Foodex and Safeways have integrated innovations such as Vendor Inventory System systems in the supply chain management. It is also able to reduce the time needed for managing the inventory level, set up the minimum order to optimize loading, improve plans to minimize costs or disruptions in the whole supply chain, detect deficiencies or surplus in the goal financial statements and give more trust in the relationship of both sides (Choi, 2004).

b. SUPPLY CHAIN PERFORMANCE

According to Serem (2002), performance is the ability to perform or capacity to achieve desired results. Supply chain performance seeks to improve the productivity of the supply chain though measuring of the whole supply chain instead of focusing on the functional units. There is a developing requirement to focus on the performance of the supply chain. According to Sharma (2005) the commonly used measures of supply chain performance are the balance score card and SCOR model. An effective SCM Performance System should be established and implemented in accordance with departmental policies and procedures and applicable legislative requirements (Maskin, 2004).

Organizations are adopting various strategies to enhance supply chain performance. Automation, use of computer aided systems and the use of the internet has become very popular. In the attempt to link up with the suppliers and customers, organizations resort to use of innovations that provide real time link with the stakeholders. Some have resorted to e-commerce and e-supply chain management (Billington, 2010). The success of supply chain depends on the ease of information flow between the organization and the stakeholders (Suppliers and Customers). Information affects all supply chain processes such as inventory forecasts, inventory allocation, and production planning among other operations (Giménez & Lourenço, 2014).

B. STATEMENT OF THE PROBLEM

Although studies have shown that innovation is critical to the survival of most organizations, most supermarkets have not adapted innovation in their operations. Consequently, their performance is dwindling and this has been attributed to competition. Nakumatt Holdings Supermarket in Kenya is one such example (Buvik and John, 2000). There is therefore, need to ensure supermarkets growth and continuity by implementing innovation. This study therefore seeks to look at certain innovative instruments, see how they have been applied within Nakumatt Holdings Supermarket and how effective they have been in improving operational efficiency.

In today's rapidly changing and highly competitive retail industry, every forward looking retailer will endeavor to ensure its products reach store's shelves ahead of the competitors (Risch, 1991). Supermarkets play an important role in Kenya's economy. They have created employment to thousands of Kenyans. Supply chain technology and supply chain management have attracted attention from many researchers as two separate research areas, however few other researchers have combined those (Shen *et al.*, 2004). According to Kenya Economic Survey (2015), wholesale and retail trade sector which supermarkets are part of is among top five sectors that have driven Kenya's growth in the last five years. There is need to ensure supermarkets growth and continuity by implementing innovation. In recent times, there have been reports of supermarkets facing supply chain management challenges resulting to low returns and closure. Their performance is dwindling and this has been attributed to competitive pressures. Nakumatt Holdings Supermarket in Kenya is one such example (Buvik and John, 2000).

There is a significant amount of research demonstrating the adoption of innovation in supermarkets. For example, Yu & Ramanathan, (2008) studied ICT adoption in UK firms and found out that out of 41 retail businesses that included supermarkets, 20 had installed high technology in ICT and had achieved significant operational efficiency. Otiso, Chelangat, & Bonuke (2012) carried out a research that aimed at establishing effectiveness of ICT in service quality delivery at Kenya Power and Lighting Company. The study found out that ICT boosted service quality and improved customer satisfaction. Omwansa (2013) in his study on ICTs and operational efficiency in supermarkets in Nairobi found out that the supermarkets with largest extent of ICT application in their premises had the highest operational efficiency. Majority of the existing studies do not address the influence of innovations adopted in supply chain performance of Nakumatt Holdings supermarket, Nairobi. This study sought to identify the influence of warehouse management system, material resource planning, enterprise resource planning, and vendor managed inventory on supply chain performance in Nakumatt Holdings supermarket.

C. RESEARCH OBJECTIVES

a. GENERAL OBJECTIVE

The general objective of the study was to determine the influence of innovations on the supply chain performance of retail industry.

a. SPECIFIC OBJECTIVES

- ✓ To establish the influence of warehouse management system on supply chain performance in Nakumatt Holdings supermarket.
- ✓ To determine the effect of material resource planning on supply chain performance in Nakumatt Holdings supermarket.
- ✓ To examine the influence of enterprise resource planning on supply chain performance in Nakumatt Holdings supermarket.
- ✓ To find out the effect of vendor managed inventory on supply chain performance in Nakumatt Holdings supermarket.

II. LITERATURE REVIEW

A. THEORETICAL REVIEW

The theoretical framework is a summary of the theories related to a particular problem that is developed through a review of previously tested knowledge of the variables involved (Breakwell, Hammon, Fife-Schaw & Smith, 2007). It identifies a plan for investigation and interpretation of the findings. The theoretical framework involves a well-supported rationale and is organized in a manner that helps the reader understand and assess your perspective (Creswell, 2005). The Main purpose of theoretical review is to show what other authors have done and relates to the researcher field. In this study, theory of Technology Acceptance, Transaction Cost Economics (TCE) and the Resource Based View (RBV) theory.

B. EMPIRICAL REVIEW OF VARIABLES

a. WAREHOUSE MANAGEMENT AND SUPPLY CHAIN PERFORMANCE

A Warehouse Management System (WMS) is an innovation that is a key part of the supply chain and primarily aims to control the movement and storage of materials within a warehouse and process the associated transactions, including shipping, receiving, put away and picking. Warehouse management systems often utilize automatic identification and data capture technology, such as barcode scanners, mobile computers, wireless LANs and potentially radio-frequency identification (RFID) to efficiently monitor the flow of products (Das & Nair, 2014).

The key function of a warehouse control system is to receive information from the upper level host system, most often being the warehouse management system, and translate

it for the daily operations. A common goal is to ensure a situation where warehouse employees never have to retype information because it already lies in one system or is collected automatically. Warehouse control system is usually the interface that is used to manage processes, people and equipment on the operational level.

Lee (2010) argued that implementation of Warehouse Management System (WMS) provide an increase in accuracy, reduction in labor costs if the labor employed to maintain the system is less than the labor saved on the warehouse floor and a greater ability to service the customer by reducing cycle times. WMS not only lead in inventory reduction but also in greater storage capacity. An increase in accuracy and efficiency of the receiving process leads to reduction in level of safety stock required. But the consequence of this reduction will hardly be visible to the overall inventory levels. WMS might just not affect the factors (lot sizing, lead times and demand variability) controlling the inventory levels. However, WMS is instrumental in more efficient and organized that leads to increased storage capacity (Lee, 2010).

b. MATERIALS RESOURCE PLANNING AND SUPPLY CHAIN PERFORMANCE

Materials Resources Planning is an innovation that assists in the detailed planning of production and its characteristics are that; it is geared specifically to assembly operations, it is a dependent demand technique and it is a computer based information system. The aim of MRP is to make available either purchased or company manufacturing assemblies just before they are required by the next stage of production or for delivery. It enables orders to be tracked throughout the entire manufacturing process and assist purchasing and control departments to move the right supplies at the right time to manufacturing or distribution points (Lysons & Farrington, 2006). Using barcode technology integrated with the MRP system saves time, increases efficiency and, above all, improves accuracy. It can help maximize productivity for warehouses, distribution centers and manufacturers alike. Businesses also have their pick of a wide variety of barcode solutions, each offering different levels of automation, allowing them to find the right fit (Stank, Dittmann, & Autry, 2011).

Distribution requirements planning (DRP) is scheduling technique that controls inventory control and applies Materials Resources Planning principles to distribution inventories. It can also be considered as a method of handling replenishment of the stock in an organization. DRP is useful for both manufacturing organizations, such as car manufactures that sell their car via several distribution points, such as regional and local distributors, and purely merchandising organizations, such as supermarkets (William, 2009).

c. ENTERPRISE RESOURCE PLANNING AND SUPPLY CHAIN PERFORMANCE

Enterprise Resource Planning innovation is a process by which a company manages and integrates the important parts of its business. ERP is designed to replace paper-based systems by analysing data from all areas of a company's resources. ERP covers all functions of a business such as purchasing, manufacturing, distribution, and inventory management. ERP is designed around a number of modules each of which can stand alone or combined with others that include finance, logistics, manufacturing, supplier management and human resources (Stevenson, 2007).

According to Shields (2001), firms expand the scope of their implementations by web enabling their ERP systems to facilitate self-service usage and link their supply chain activities to obtain increased performance. This is as a result among firms that fully integrated system deployment across the supply chain and effective system usage would help garner synergistic benefits. For an organization to provide effective ERP integration to the SCM, it should encompass all the functions responsible for development and execution of each of the core activities: plan, source, make, deliver, and return processes, as well as the supporting infrastructure (Cohen, 2006).

ERP systems are comprised of integrated modules that support intra-firm and inter-firm business activities, and firms implement those ERP system modules, which ensure the availability of full system functionality for meeting all their business needs (Appelrath & Ritter, 2000). Some of the ERP systems that are commonly being implemented include: procurement, sales and distribution, inventory and material management, quality management, manufacturing, planning and control, plant and machine maintenance, warehousing systems and customer relationship systems. T.

d. VENDOR MANAGED INVENTORY AND SUPPLY CHAIN PERFORMANCE

Vendor Managed Inventory (VMI) is one of the many innovation that strive towards closer cooperation between the members of supply chains in the area of inventory and demand management (Daughtery et al., 2009). Vendor Managed Inventory is an inventory management process that falls under the 'push' stock management processes. These are processes that are triggered by interpretation of an expected demand in inventory and supply is scheduled to meet this demand. Vendor Managed Inventory/Consignment Stock is inventory that is in the possession of the buyer (shop, warehouse or store), but is still owned by the supplier. Payment of the inventory is made once it is sold. Accordingly, the capital investment on the stock comes from the supplier and the buyer provides space for it (Kumar & Kumar, 2003).

The Vendor Managed Inventory initiative has the goal of accomplishing deeper integration and collaboration between the members of the supply chain in order to cope with the ever decreasing time windows for product and service fulfilment, and the requirements for the improvement of operational efficiency. Benefits cited as a result of adoption of Vendor Managed Inventory systems include lowered inventory levels, faster inventory turns, reduced ordering and administrative costs, better cash flow management, zero obsolescence, increased sales, and reduced out-of-stock costs among others (Angulo, Nachtmann, & Waller, 2004).

Lee (2010) found that Vendor Managed Inventory greatly reduced inventory-carrying costs and stock-out problems while, at the same time, it offered the ability to synchronize

both inventory and transportation decisions. Fox (2006) noted that Vendor Managed Inventory's advantages included improved customer service, reduced demand uncertainty, reduced inventory requirements and reduced cost based on a case study at Johnson and Johnson. In a Vendor Managed Inventory's partnership, the supplier, usually the manufacturer but sometimes a reseller or distributor, makes the main inventory replenishment decisions for the consuming organization. This means that the vendor monitors buyers inventory levels (physically or via electronic messaging) and makes periodic re-supply decisions regarding order quantities, shipping and timing. Transactions that are customarily initiated by the buyer, such as purchase orders, are initiated by the supplier. Indeed the purchase order acknowledgement from the vendor may be the first indication that a transaction is taking place; an advance shipping notice informs the buyer of materials in transit (Lee, 2010).

C. EMPIRICAL REVIEW

Ageron et al. (2013), argue that operational processes, innovations, and managerial processes improve supply chain management performance. Golgeci & Ponomarov (2013) found a positive association between innovativeness and innovation magnitude with Supply Chain resilience. Oke & Prajogo (2013) found supply chain partner innovativeness to influence product innovation strategy. They also show that the impact of supply chain partner innovativeness on innovation strategy is improved with stronger strategic relationship with key partners. Chong, Chan, Ooi, & Sim (2011) found that supply chain practices of Malaysian firms improve firms' innovation and organizational performance. Lee, Lee, & Schniederjans (2011) found that supply chain innovation reduces operational cost, lead time, create superior operational strategies, enhance quality, and provide visibility and flexibility for dealing with rapid changes in customer demand.

Locally, various studies on the topic of innovation have been carried out by a number of researchers. Aswani (2010) carried out a study on strategic innovations and performance of public universities. The study concluded that there exist a positive relationship between strategic innovation and performance of public universities. Kemoli (2010) carried out a study on strategic innovations and performance of commercial banks listed in NSE. The study concluded that listed Commercial banks had deviated from the existing industry rules and engaged in creation of new and significant customer value and that strategic innovation was embedded in their corporate strategy. Karanja (2009) carried out a study on innovation strategies adopted by insurance companies in Kenya. The study concluded that companies with strong technology-enabled innovation strategies are more likely to secure competitive advantage and create superior shareholder value. Lusweti (2009) reviewed innovation strategies adopted by radio stations in Kenya. This study concluded that innovation strategies are very essential in any business and hence they should be put in place at any cost since it helps the organization to realize their objectives.

III. RESEARCH METHODOLOGY

A. RESEARCH DESIGN

Research design is the plan, structure and strategy of investigation conceived so as to obtain answers to research questions and control variance. A descriptive study is concerned with determining the frequency with which something occurs or the relationship between variables (Cooper & Schindler, 2003). This approach was suitable for this study since the researcher intended to collect detailed information through descriptions making it useful to identify variables under the study.

B. POPULATION AND TARGET POPULATION

Population refers to the entire group of people, events, or things of interest that the researcher wishes to investigate (Cooper & Schindler, 2003). The Target population in this study was Nakumatt holding Supermarket seventeen (17) branches in Nairobi County that includes senior personnel in the following departments; finance division, customer care, supply and administration, sales and marketing department. The study targeted the personnel in those departments as they are better position to answer questions relating to innovations adopted by the company. From the 17 branches the researcher adopted random sampling to obtain four (4) branches (strata), that includes; Nakumatt Cross-road, Nakumatt Galleria, Nakumatt Prestige and Nakumatt Junction.

Population refers to an aggregate or totality of all the objects, subjects or members that conform to a set of specifications (Polit and Hungler, 1999). The four branches had a population of four hundred and fifty three (453) staffs.

C. SAMPLE AND SAMPLING TECHNIQUE

To come up with an appropriate study sample, the study utilized stratified sampling technique where the Nakumatt Holding Supermarkets will be classified into different branches. The rationale behind the selection of the stratified sampling was because the Nakumatt branches are evenly distributed across Nairobi County and this ensured collection of unbiased data. The strata's was Nakumatt Cross-road, Nakumatt Galleria, Nakumatt Prestige and Nakumatt Junction Branches. Purposive sampling was then used to pick employees to participate in the study. According to Mugenda & Mugenda (2003) a sample size of 10% to 30 % is a good representation of the target population and hence the 15% is adequate for analysis. The sample size of this study was therefore 68 employees of Nakumatt supermarket.

D. INSTRUMENT

According to Massey (2003), a data collection instrument or tool is a device used to collect the data. The type of instrument used by the researcher depends on the data collection method selected. Massey (2003), further states that the instrument must be reliable and valid. The study used structured questionnaires to obtain data from respondents. Questionnaire was calibrated using a five point Likert Scale,

ranging from 'strongly agree' (SA) to 'strongly disagree' (SD). The questionnaire consisted of both close and open ended items. The questionnaires was structured as follows: Section I: Background Information, Section II: The influence of warehouse management system on supply chain performance in Nakumatt Holdings supermarket, Section III: The effect of material resource planning on supply chain performance in Nakumatt Holdings supermarket, Section IV: The influence of enterprise resource planning on supply chain performance in Nakumatt Holdings supermarket , and Section V: The effect of Vendor managed inventory on supply chain performance in Nakumatt Holdings supermarket.

E. DATA COLLECTION PROCEDURE

Prior to administering study instruments, a brief introduction was made to the respondents explaining the nature and importance of the study to the respondents during pilot and main study. Data collection was done by the drop and pick method. The questionnaires were dropped at Nakumatt Holding Supermarket branches in Nairobi and later picked. According to Leedy and Ormrod (2001), respondents are more truthful while responding to the questionnaires regarding controversial issues in particular due to the fact that their responses are anonymous.

F. PILOT TEST

The research instrument that was used to collect data is questionnaires. Validity shows whether the items measure what they are designed to measure (Borg and Gall, 1989). Pre-testing was conducted to assist in determining accuracy, clarity and suitability of the research instrument. Borg and Gall (1996), notes that two to three cases are sufficient for some pilot studies. For this study, pilot study was done on Nakumatt supermarket lifestyle. Those who participated on the pilot test did not participate on the actual study. Content validity was examined to ensure the instruments would answer all the research questions. Based on the analysis of the pre-test results, the researcher made corrections, adjustments and additions to some research instruments.

G. DATA PROCESSING AND ANALYSIS

The data collected was coded and entered into the computer and analyzed using descriptive statistics with the help of SPSS version 24. The researcher used percentages, frequencies, and inferential analysis to establish the relationship between innovation and supply chain performance of Nakumatt holdings supermarket. Data collected was presented using tables. The data was coded, assigned labels to variables categories and entered into the computer. Pearson's Correlation Coefficient and ANOVA was used to establish the significance of the correlation between innovation and supply chain performance at Nakumatt Holdings Supermarket.

IV. DATA ANALYSIS, RESULTS AND DISCUSSION

A. RESPONSE RATE

The respondents comprised of Nakumatt holding supermarket employees in Nairobi County that includes senior personnel in the following department; finance division, customer care, supply and administration, sales and marketing department. Out of the 68 issued questionnaires, 60 questionnaires representing 88% of the total questionnaires distributed were returned fully completed, while 8 questionnaires were not returned representing 12% of the total questions distributed to the respondents. The table 4.1 presents that the response rate was 88% of the total sample size and the non-response was 12%. The response of 88% facilitated towards gathering sufficient data that was generalized to reflect the opinions of respondents. This was in tandem with Graham (2002) that a response rate above 30 to 50% of the total sample size contributes towards gathering of sufficient data that could be generalized to represent the opinions of respondents in the target population on the sought study problem.

B. PILOT TEST RESULTS

a. VALIDITY

To establish the validity of the data collection instruments, the research instruments were given to respondents at Nakumatt supermarket lifestyle branch. The coefficient of the data gathered from the pilot study was computed with assistance of Statistical Package for Social Sciences (SPSS) Version 24. A context of validity coefficient index of above 0.82 was obtained and this implied that the questionnaires were valid research instrument for the study.

b. RELIABILITY ANALYSIS

The results in the table 4.2 show Cronbach's alpha of well above 0.7 and most of it above 0.8 implying that the instruments were sufficiently reliable for measurement. The study accepted a Cronbach alpha of 0.7 and above. Since most items total correlations were reasonably high, the construct validity of the instrument was considered reasonable (Brown, 2006).

Constructs	Cronbach's Alpha Values	Comments
Warehouse management	0.738	Accepted
Material resource planning	0.812	Good
Enterprise resource planning	0.864	Good
Vendor managed inventory	0.882	Good

Table 4.1: Reliability Results

C. DEMOGRAPHIC INFORMATION

The section contains information on the demographic characteristics of the respondents such as gender, age, highest level of education, department and years of experience and level of management.

a. GENDER OF THE RESPONDENTS

The study sought to establish the gender of the respondents in order to establish the level of gender representation within the supermarket. Figure 4.1 below shows the gender characteristics of the respondents.

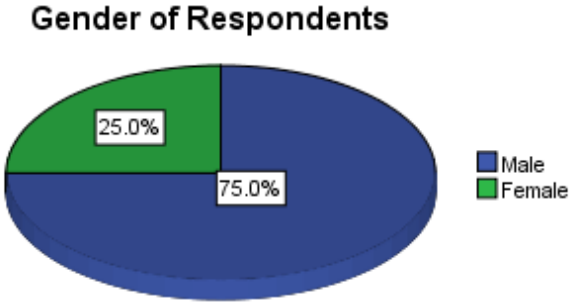

Figure 4.1: Gender of Respondents

Based on the study results on figure 4.1 above majority (75.0%) of the respondents indicated that they were males, while the least (25.0%) were of female gender.

b. AGE BRACKET OF RESPONDENTS

Respondents were asked their age bracket and the findings are as shown in Figure 4.2;

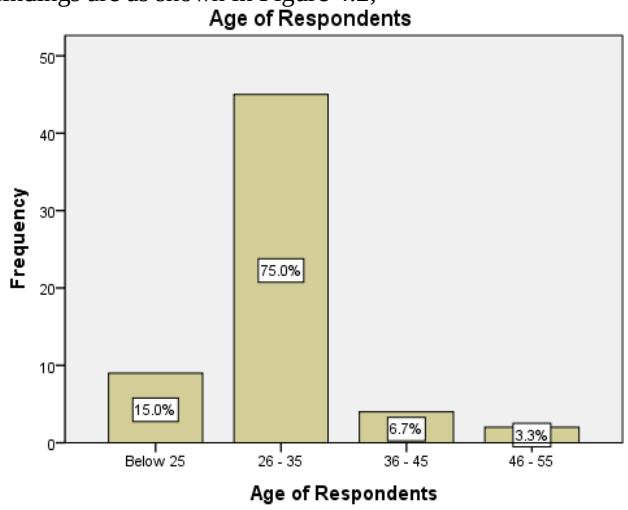

Figure 4.2: Age of Respondents

Figure 4.2 presents that majority (75.0%) of the respondents who were in the age category of 26-35 years, 15.0 % were below years, 6.7% were in the category of 36-45 years while only 3.3% were aged between 46-55. No respondent were aged above 56 years. This suggests that most of the respondents are considered to be the productive years.

c. HIGHEST EDUCATION LEVEL

The study sought to establish the education level held by the employees in order to ascertain if they were equipped with relevant knowledge and skills in their area of work. Table 4.3 below shows the highest level of education of the respondents.

	Frequency	Percent
Masters	4	6.7
Degree	13	21.7
Diploma	27	45.0
Certificate	12	20.0
Others	4	6.7
Total	**60**	**100.0**

Table 4.2: Highest level of education

The findings in Table 4.2 shows majority of the respondents (45.0%) had attained a Diploma as their highest level of education while 21.7% had a Bachelor's degree. The study further established that 20.0% of the respondents had a certificate, and 6.7% with masters. Moreover, 6.7% indicated they had other qualifications and Table 4.3 shows what they specified. This indicates that the respondents were in a position to answer the questionnaire.

		Count	Column N %
If your highest education level is Other, please specify	CPA	3	75.0%
	O Level	1	25.0%

Table 4.3: Other qualifications

Table 4.3 reveals that 4 respondents said they had other qualifications where 3 respondents had CPA certification (75.0%) and 1 attained O level (25.0%).

d. YEARS OF EXPERIENCE

The study on figure 4.3 below shows the number of years the respondents have been working at Nakumatt Supermarket.

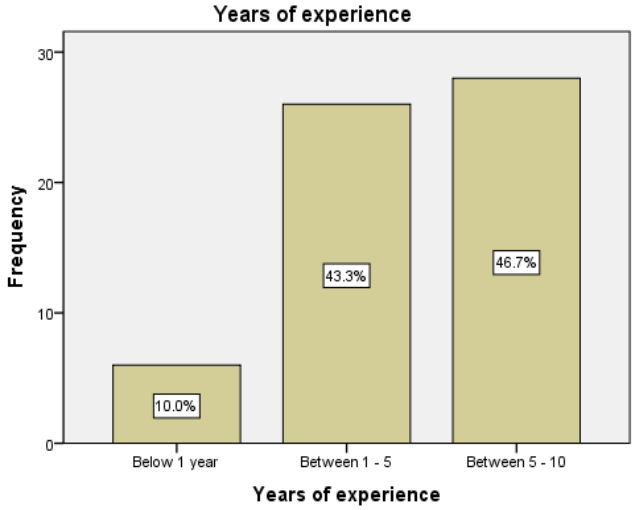

Figure 4.3: Years of experience

Results shown on Figure 4.3 above indicate that the study majority (46.7%) of the respondents had served in the supermarket for between 5-10 years. A further 43.3% had served between 1-5 years, and 10.0% had served below 1 year. The outcome reveals that the respondents were experienced in their area of work implying that their responses portray the true activities which are in place.

e. DEPARTMENT

The respondents were asked to indicate the department where they work. The findings are shown in Table 4.5 below;

	Frequency	Percent
Accounts	9	15.0
Beverage	2	3.3
Clerk	3	5.0
Customer service	5	8.3

IT	9	15.0
Management	4	6.7
Marketing	8	13.3
Procurement	16	26.7
Sales	2	3.3
Soaps	2	3.3
Total	**60**	**100.0**

Table 4.4: Department

The findings indicated that majority of the respondents (26.7%) were from the procurement department, Accounts and Information technology each had 15.0 %. In addition, Marketing had 13.3%, Customer service had 8.3%, Management comprised of 6.7%, and clerks comprised of 5.0%. Beverage, sales, and soaps each had 3.3% of the respondents. This shows that all the department were represented in the study.

f. LEVEL OF MANAGEMENT

Respondents were asked to indicate the level of management. The findings are shown in Table 4.5

Level of Management	Frequency	Percent
Senior	10	16.7
Middle Management	38	63.3
Operational Level	12	20.0
Total	60	100.0

Table 4.5: Level of Management

Majority of the respondents were on middle management level (63.3%), 20.0% of the respondent were on operational level while 16.7 % of the respondents were on senior level management. This shows that the respondents were spread across the three levels of management.

D. STUDY VARIABLES

a. WAREHOUSE MANAGEMENT SYSTEM

This section of the questionnaire sought to get from the respondents on the influence of warehouse management system on supply chain performance in Nakumatt Holdings Supermarket. The range was 'strongly agree (1) to 'strongly disagree' (5). The scores of agreeing have been taken to represent a variable which had a mean score of 0 to 2.4 on the continuous Likert scale; (0≤ Mean<2.4). The scores of 'Undecided have been taken to represent a variable with a mean score of 2.5 to 3.4 on the continuous Likert scale: (2.5≤Mean<3.4) and the score of both disagree and strongly disagree have been taken to represent a variable which had a mean score of 3.5 to 5.0 on a continuous Likert scale; (3.5≤ S.A. <5.0). A standard deviation of > 0.9 implies a significant difference on the impact of the variable among respondents.

	N	Mean	Std. Deviation
Warehousing Management System has enabled tracking movement of stock units in the warehouse/stores	60	2.40	1.138
Warehousing Management System has made stock taking in the warehouse easier	60	2.47	1.295
Warehousing Management System has provided greater data accuracy on inventories	60	2.48	1.157
Warehousing Management System has enhanced the receipt and dispersal of inventory entering or leaving warehouse	60	2.60	1.224
Warehousing Management System has reduced pilferages of inventory	60	2.40	1.182
Valid N (listwise)	60		

Table 4.6: Warehouse management system

From the result in Table 4.6 above, warehousing Management System has enabled tracking movement of stock units in the warehouse/stores (mean = 2.40, SD =1.138), warehousing Management System has reduced pilferages of inventory (mean = 2.40, SD =1.182), warehousing Management System has made stock taking in the warehouse easier (mean = 2.47, SD =1.295), warehousing Management System has provided greater data accuracy on inventories (mean = 2.48, SD =1.157), and warehousing Management System has enhanced the receipt and dispersal of inventory entering or leaving warehouse (mean = 2.60, SD =1.224).

The mean ranged from 2.4 to 2.6. This meant that the respondents agreed on some statements and were not sure (undecided) on some other statements posed in the questionnaire. Therefore the warehouse management system put in place was not adequate to improve supply chain performance.

The findings of the study agreed with Lee (2010) who argued that implementation of Warehouse Management System (WMS) provide an increase in accuracy, reduction in labor costs if the labor employed to maintain the system is less than the labor saved on the warehouse floor and a greater ability to service the customer by reducing cycle times.

The respondents also cited that there was use of barcodes in their warehouses and generally Warehouse Management System integration which has led to reduced time taken on stock taking, increased efficiency in the warehouse and that it has improved accuracy especially the stock. This agreed with Stank, Dittmann, &Autry (2011) which said that using barcode technology integrated with the MRP system saves time, increases efficiency and, above all, improves accuracy. Barcodes can also help maximize productivity for warehouses, distribution centers and manufacturers alike.

b. MATERIAL RESOURCE PLANNING

This section of the questionnaire sought to get from the respondents on the effect of material resource planning on supply chain management. Likert scale was used where mean ranging from 0 to 2.5 (0≤ Mean<2.4) meant disagree, 2.5 to 3.4 (2.5≤Mean<3.4) meant undecided, and the score of both agree and strongly agree have been taken to represent a variable which had a mean score of 3.5 to 5.0 (3.5≤ Mean<5.0).

	N	Mean	Std. Deviation
Material Resource Planning has improved coordination of inventory management decisions between departments involved in inventory management	60	2.92	1.139
There is reduction in the lead time in replenishing inventory	60	2.67	1.230
Material Resource Planning systems have reduced cost of ordering stock	60	2.90	1.272
Material Resource Planning has improved order processing	60	3.00	1.402
Valid N (listwise)	60		

Table 4.7: Material resource planning

From the Table 4.7 above, material resource planning has improved order processing (mean = 3.00, SD =1.402), material resource planning has improved coordination of inventory management decisions between departments involved in inventory management (mean = 2.92, SD =1.139), material resource planning systems have reduced cost of ordering stock (mean = 2.90, SD =1.272), and there is reduction in the lead time in replenishing inventory (mean = 2.67, SD =1.230). The findings presented in table 4.7 revealed that the respondents were undecided if material resource planning support supply chain performance in Nakumatt holding supermarket.

Earlier studies by Lysons & Farrington, 2006 showed that material resource planning has enabled orders to be tracked throughout the entire manufacturing process and assist purchasing and control departments to move to the right supplies at the right time to manufacturing or distribution points which agrees with the outcome of the study.

c. *ENTERPRISE RESOURCE PLANNING*

Top management enterprise resource planning was assessed in a view to determine its influence on supply chain performance in Nakumatt Holdings Supermarket. Likert scale was used where: 1 = Very low level 2 = Low level 3 = Moderate level 4 = High level 5 = Very high level. The results are indicated in Table 4.8 below;

	N	Mean	Std. Deviation
Enterprise Resource Planning systems have reduced cost of ordering stock	60	3.03	1.314
Enterprise Resource Planning has improved order processing	60	2.93	1.191
Aids in collaborative planning and replenishment decisions	60	3.13	1.127
Enhancing procurement and ordering processes.	60	3.00	1.221
Enterprise Resource Planning makes it easy to share of information	60	3.12	1.195
Valid N (listwise)	60		

Table 4.8: Enterprise resource planning

The findings as exhibited by Table 4.8 acknowledged to a moderate level that enterprise resource planning aids in collaborative planning and replenishment decisions (mean = 3.13, SD =1.127) and enterprise resource planning makes it easy to share of information (mean = 3.12, SD =1.195). The findings also shows that Enterprise Resource Planning systems have reduced cost of ordering stock (mean = 3.03, SD =1.314) and it enhances procurement and ordering processes (mean = 3.00, SD = 1.221). Furthermore the study showed that Enterprise Resource Planning has improved order processing (mean = 2.93, SD =1.191).

According to Shields (2001), firms expand the scope of their implementations by web enabling their ERP systems to facilitate self-service usage and link their supply chain activities to obtain increased performance. This is as a result among firms that fully integrated system deployment across the supply chain and effective system usage would help garner synergistic benefits. For an organization to provide effective ERP integration to the SCM, it should encompass all the functions responsible for development and execution of each of the core activities: plan, source, make, deliver, and return processes, as well as the supporting infrastructure (Cohen, 2006).

d. *VENDOR MANAGED INVENTORY*

This section of the questionnaire sought to get from the respondents on the effect of Vender Managed Inventory on supply chain performance in Nakumatt Holdings Supermarket.

	N	Mean	Std. Deviation
Vendor Managed Inventory has enhanced information sharing with suppliers.	60	3.43	1.307
Vendor Managed Inventory has improved the supplier relationships	60	3.37	1.288
Vendor Managed Inventory has enhanced streamlining of supply chain by removal of inefficient intermediaries	60	3.40	1.182
Vendor Managed Inventory has made it possible to enter into long-term commitments with suppliers	60	3.42	1.279
Vendor Managed Inventory has reduced pilferages of inventory	60	3.37	1.134
Valid N (listwise)	60		

Table 4.9: Vender Managed Inventory

The findings from Table 4.9 shows that Vendor Managed Inventory has enhanced information sharing with suppliers (mean = 3.43, SD =1.307), Vendor Managed Inventory has made it possible to enter into long-term commitments with suppliers (mean = 3.42, SD =1.279), Vendor Managed Inventory has enhanced streamlining of supply chain by removal of inefficient intermediaries (mean = 3.40, SD =1.182), Vendor Managed Inventory has improved the supplier relationships (mean = 3.37, SD = 1.288), and Vendor

Managed Inventory has reduced pilferages of inventory (mean = 3.37, SD =1.134) according to respondents.

The results agreed with previous studies by Lee (2010) found that Vendor Managed Inventory greatly reduced inventory-carrying costs and stock-out problems while, at the same time, it offered the ability to synchronize both inventory and transportation decisions. In addition, Fox (2006) noted that Vendor Managed Inventory's advantages included improved customer service, reduced demand uncertainty, reduced inventory requirements and reduced cost based on a case study at Johnson and Johnson.

The findings also agreed with the previous findings by Angulo, Nachtmann & Waller (2004) adoption of Vendor Managed Inventory systems benefits include lowered inventory levels, faster inventory turns, reduced ordering and administrative costs, better cash flow management, zero obsolescence, increased sales, and reduced out-of-stock costs among others.

The respondents furthermore, indicated other ways Vendor Managed inventory has improved supply chain performance, in that it has led to reduced lead time of delivery of products hence reducing the problem of understocking in the warehouses of Nakumatt Holdings Supermarket thereby fulfilling its customers' demands on time. This agreed to previous studies by Daughtery et al., (2009) which stated that Vendor Managed Inventory (VMI) is one of the many innovation that strive towards closer cooperation between the members of supply chains in the area of inventory and demand management.

E. REGRESSION RESULTS

The linear regression model below;

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

Where Y is the knowledge on management system supply chain performance, β_0 is constant and ε is the error term of the model.

X_1 = Warehouse management system
X_2 = Material resource planning
X_3 = Enterprise resource planning
X_4 = Vendor managed inventory

a. MODEL SUMMARY

Results from Table 4.10 indicates Coefficient of determination R^2 value of .874, This implies that Y; supply chain efficiency influenced by X_1; Warehouse management system, X_2; Material resource planning, X_3; Enterprise resource planning and X_4; Vendor managed inventory at 87.4 %. At a 0.05 level of significance. This therefore means that majority agree the independent variables are critical factors to supply chain efficiency.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.935[a]	.874	.778	2.942

Table 4.10: Model Summary

b. ANALYSIS OF VARIANCE

Table 4.11 presents the results of ANOVA test which reveal that all the independent variables notably; (X_1) Warehouse management system, (X_2) Material resource planning, (X3) Enterprise resource planning and (X_4) Vendor managed inventory have a significance influence on supply chain performance. Since the P value is actual 0.02 which is less than 0.05 level of significance. Table 4.11 also indicates that the high value of F (79.086) with significant level of 0.00 is large enough to conclude that all the independent variables significantly influence supply chain performance.

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2280.980	17	78.654	79.086	.002[b]
	Residual	328.961	64	8.657		
	Total	2609.941	81			

Table 4.11: Analysis of Variance

c. BETA COEFFICIENTS

Table 4.12 presents the results of the test of beta coefficients which indicates that the significant relationship between independent variables notably; (X_1) Warehouse management system, (X_2) Material resource planning, (X3) Enterprise resource planning and (X_4) Vendor managed inventory and dependent variable Y = supply chain performance.

As presented in Table 4.12, (X_1) Warehouse management system coefficient of 0.865 was found to be positive at significant level of 0.0012 and this indicates that warehouse management system has a positive influence on supply chain performance, (X_2) Material resource planning coefficient of 0.868 was found to be positive at significant level of 0.0022 and this indicates that material resource planning has a positive influence on supply chain performance, (X3) Enterprise resource planning coefficient of 0.810 was found to be positive at significant level of 0.0019 and this indicates that enterprise resource planning has a positive influence on supply chain performance. (X_4) Vendor managed inventory coefficient of 0.741 was found to be positive at significant level of 0.001 and this indicates that Vendor managed inventory has a positive influence on supply chain performance. This clearly demonstrates that all the independent variables significantly influenced supply chain performance.

However, since the significance values were less than 0.005, all the coefficients were significant an thus the regression model was fit;

$$Y = 0.243 + 0.741X_1 + 0.865X_2 + 0.810X_3 + 0.868X_4 + \varepsilon$$

From Table 4.12, the t values of 1.703, 1.060, 1.335 and 1.723 is statistically significant. Kothari (2008) notes that the closer T is to 0, the more likely there isn't a significant difference.

Beta Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	.243	.233		1.546	.0001
Warehouse management system	.865	.508	.156	1.703	.0012

Material resource planning	.868	.819	.130	1.060	.0022
Enterprise resource planning	.810	.607	.130	1.335	.0019
Vendor managed inventory	.741	.430	.140	1.723	.0009

Table 4.12: Beta Coefficients

V. SUMMARY, CONCLUSION AND RECOMMENDATIONS

A. SUMMARY OF FINDINGS

a. WAREHOUSE MANAGEMENT SYSTEM

Respondents agreed that Warehouse Management System has enabled tracking movement of stock units in the warehouse/stores (mean = 2.40, SD =1.138), warehousing Management System has reduced pilferages of inventory (mean = 2.40, SD =1.182), warehousing Management System has made stock taking in the warehouse easier (mean = 2.47, SD =1.295) , warehousing Management System has provided greater data accuracy on inventories (mean = 2.48, SD =1.157), and warehousing Management System has enhanced the receipt and dispersal of inventory entering or leaving warehouse (mean = 2.60, SD =1.224). Therefore the warehouse management system put in place was not adequate to improve supply chain performance.

b. MATERIAL RESOURCE PLANNING

The findings revealed that the respondents were undecided if material resource planning support supply chain performance in Nakumatt holding supermarket. Material resource planning has improved order processing (mean = 3.00, SD =1.402), material resource planning has improved coordination of inventory management decisions between departments involved in inventory management (mean = 2.92, SD =1.139), material resource planning systems have reduced cost of ordering stock (mean = 2.90, SD =1.272), and there is reduction in the lead time in replenishing inventory (mean = 2.67, SD =1.230).

c. ENTERPRISE RESOURCE PLANNING

Respondents acknowledged to a moderate level that enterprise resource planning aids in collaborative planning and replenishment decisions (mean = 3.13, SD =1.127) and enterprise resource planning makes it easy to share of information (mean = 3.12, SD =1.195). The findings also shows that Enterprise Resource Planning systems have reduced cost of ordering stock (mean = 3.03, SD =1.314) and it enhances procurement and ordering processes (mean = 3.00, SD = 1.221). Furthermore the study revealed that Enterprise Resource Planning has improved order processing (mean = 2.93, SD =1.191).

d. VENDOR MANAGED INVENTORY

The findings indicated that Vendor Managed Inventory has enhanced information sharing with suppliers (mean = 3.43, SD =1.307), has made it possible to enter into long-term commitments with suppliers (mean = 3.42, SD =1.279). Further, the study showed that Vendor Managed Inventory has enhanced streamlining of supply chain by removal of inefficient intermediaries (mean = 3.40, SD =1.182), has improved the supplier relationships (mean = 3.37, SD = 1.288), and has reduced pilferages of inventory (mean = 3.37, SD =1.134) according to respondents.

The results of ANOVA test which reveal that all the independent variables notably have a significance influence on supply chain performance. Since the P value < 0.05 level of significance, there is sufficient evidence to conclude that all the independent variables significantly influence supply chain performance.

Regression analysis reveals warehouse management system coefficient of 0.865 was found to be positive at significant level of 0.0012 and this indicates that warehouse management system has a positive influence on supply chain performance, Material resource planning coefficient of 0.868 was found to be positive at significant level of 0.0022 and this indicates that material resource planning has a positive influence on supply chain performance, Enterprise resource planning coefficient of 0.810 was found to be positive at significant level of 0.0019 and this indicates that enterprise resource planning has a positive influence on supply chain performance. Vendor managed inventory coefficient of 0.741 was found to be positive at significant level of 0.001 and this indicates that Vendor managed inventory has a positive influence on supply chain performance. This clearly demonstrates that all the independent variables significantly influenced supply chain performance.

B. CONCLUSION

The study concluded that Warehousing Management System has a positive effect on supply chain performance. It has enabled tracking movement of stock units in the warehouse/stores, reduced pilferages of inventory, and made stock taking in the warehouse easier. Warehousing Management System provides greater data accuracy on inventories, and enhances the receipt and dispersal of inventory entering or leaving.

The study also concluded that Material Resource Planning improves order processing and improves coordination of inventory management decisions between departments involved in inventory management. Further, the study concluded that Material Resource Planning systems reduces cost of ordering stock and lead time in replenishing inventory.

The study also concluded that Enterprise Resource Planning aids in collaborative planning and replenishment decisions and makes it easy to share of information. Enterprise Resource Planning systems reduces cost of ordering stock and it enhances procurement and ordering processes.

The study also concluded that Vendor Managed Inventory enhances information sharing with suppliers and made it possible to enter into long-term commitments with suppliers.

The study further concluded that Vendor Managed Inventory enhances streamlining of supply chain by removal of inefficient intermediaries, and improves the supplier relationships.

C. RECOMMENDATIONS

The study makes the following recommendations based on the findings and conclusions: first, the supermarkets intending to partner in vendor managed inventory should focus on developing strong ICT systems, strong warehousing facilities (either by lease or build) and/or by engaging large suppliers to lease from third parties. This would hasten the implementation of vendor managed inventory in retail supermarkets.

Also, the retail supermarkets should enter into vendor managed agreements defining clearly the responsibilities and obligations of the parties involved. This would ensure a smooth flow of not only information sharing but also in the execution the vendor managed responsibilities as defined in the agreement to avoid mistrust and eventual fall out.

In addition, vendor managed inventory implementation can be phased with few established suppliers and with few non-shelf life goods. This would ensure reduced conflict with partners, and also allow employees to adjust to the new level of business. Lastly, the retail supermarket should first implement an inventory policy that defines the optimal stock levels which is based on demand forecasts and actual usage/sales.

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