

**SUPPLY CHAIN MANAGEMENT PRACTICES AND PERFORMANCE OF  
FIRMS IN ELEVATOR INDUSTRY IN KENYA.**

**BY**

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**D61/63148/2011**

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**A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE  
REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS  
ADMINISTRATION (MBA), SCHOOL OF BUSINESS, UNIVERSITY OF  
NAIROBI**

**2013**

## DECLARATION

I declare that this research project is my original work and has never been submitted to any other University for assessment or award of a degree.

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This project has been submitted with my approval as the University Supervisor:

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## **DEDICATION**

I dedicate this research project first to God almighty through whom all things are possible. Secondly to my husband, child and friends for their support, encouragement, valued guidance and for providing an enabling environment that made me complete the research project successfully. Thirdly to my father and mother for their unlimited support.

## **ACKNOWLEDGEMENT**

I most sincerely thank the almighty God for helping me to complete this project despite the various challenges that I faced in the course of doing it. I appreciate the tremendous input and professional guidance given to me by my supervisor Mr. Michael Chirchir I also acknowledge and thank my husband and our dear child for their support and encouragement. Their patience while I was a way for long hours doing this study is commendable.

## **ABSTRACT**

The purpose of this study was to determine the effect of supply chain management practices on performance of Elevator firms in Kenya. A descriptive research design was used to establish the effect of supply chain management practices on performance of elevator firms in Kenya. The target population was 13 elevator firms in Kenya. Given the relatively small number, a census was conducted. Primary data was collected by means of semi structured questionnaire. Descriptive statistics such as mean scores, standard deviation, regression and correlation was used to analyze the data.

The negative relationship between performance and pricing could be attributed to the negative impact of local taxes on the development and maintenance of high valued machines. The level of service rendered to the public by the some elevator firms does not represent value for money paid due to poor materials. Furthermore, most elevator firms are poorly maintained and often in dilapidated status. Hence, their performance is very low even though building values have been rapidly rising. The study concluded that supply chain management practices have a negative impact on elevator firm's performance especially where service delivery is poor, mismanagement and corruption abounds. It was also concluded that pricing is negatively related to firm's performance. This is attributed to the negative impact of local taxes on the development and maintenance of high valued machines. The level of service rendered to the public by the some elevator firms does not represent value for money paid due to poor materials. Furthermore, most elevator firms are poorly maintained and often in dilapidated status.

Based on the above, it was recommended that elevator firms should incorporate customer service as a supply chain management practice to all departments because they work towards achieving the overall performance of the firms. There should be a clear policy on the repairs and maintenance practices as there are some firms which take long to provide repairs and maintenance. Elevator firms are usually very busy place. Some respondents showed signs of declining the researcher's advances by failing to cooperate fully as expected, citing that they are having a tight schedule. Further research could be carried on the influence of supply chain management practices on performance of elevator firms in Kenya; there are other supply chain management practices that are different from the ones identified in this study which include outsourcing.

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## **LIST OF ACRONYMS**

<b>EDI</b>	Electronic Data Interchange
<b>ERC</b>	Energy Regulatory Commission
<b>ERP</b>	Electronic Resource Planning
<b>GSCM</b>	Green Supply Chain Management
<b>IT</b>	Information Technology
<b>JIT</b>	Just In Time
<b>MRP</b>	Material Requirements Planning
<b>NCA</b>	National Construction Authority
<b>PM</b>	Performance Measurement
<b>PSAs</b>	Product and Service Agreements
<b>PO</b>	Purchase Order
<b>SC</b>	Supply Chain
<b>SCM</b>	Supply Chain Management
<b>SCMP</b>	Supply Chain Management Practices
<b>VMI</b>	Vendor Managed Inventory

# CHAPTER ONE: INTRODUCTION

## 1.1 Background of the Study

With an expanding number of rivals, both local and global trades not only have to re-establish their companies to produce higher-quality products and services, decrease waste, respond rapidly to the market, but also to handle their supply chain management (SCM) efficiently. This is because the concepts and practices of SCM have been touted as improving the performance of organizations who participate in them (Giunipero et al., 2008). Carter and Narasimhan (2006) suggest that SCM and purchasing practices, associated with competition capabilities of the firm, may have more significant effects on firm performance. They show that, depending on advertising, level of competition, product pricing and positioning, and the degree of innovation in product lines factors on the overall performance and success of the firm. Supply chain management (SCM) practices seek to enhance competitive performance by closely integrating the internal functions within a company and external operations of suppliers, customers, and other channel members. The benefit of such supply chain integration can be attained through efficient linkage among various supply chain activities. The linkage should be subject to the effective construction and utilization of various supply chain practices for an integrated supply chain (Narasimhan, 2007).

Supply chain practices cannot, on their own improve efficiency. Efficiency is achieved through the interaction of various supply chain practices. Dawe (2004) points that, for effective SCM, a comprehensive effort for improvement in all supply chain functions within a firm should be made. Fundamentally, the focus of supply chain practices should

shift from functional and independent, to general and integrative. This implies that the performance of each supply chain practice should be evaluated depending on how the practice has a significant effect on the efficient integration of the entire supply chain process. Thus, the successful achievement of SC integration can be possible by the systematic utilization of various supply chain practices. Bowersox (2009) also has the same perspective with the above argument. He asserts that, the process of SC integration should progress from the integration of internal logistics processes to external integration with suppliers and customers. This internal integration can be accomplished by the automation and standardization of each internal logistics function, the introduction of new technology, and continuous performance control under formalized and centralized organizational structure (Bowersox, 2009).

### **1.1.1 Supply Chain Management Practices**

Slack et al. (1995) observed that economy is becoming increasingly globalised and fierce competition means more and more production is outsourced to high-skill, low-cost areas. As a result, innovative supply chain management is often central to commercial survival. This exciting new programme has been developed to meet the growing demand for experts who understand both supply chain management issues and the role of innovation in business success. A key feature of a good supply chain manager is the ability to understand all the links in the supply chain and to implement strategic change projects that will keep the supply chain competitive (Narasimhan and Carter, 2008)

According to Ireland and Webb (2007), in today's competitive environment, managing transportation, inventory, product plans and schedules, and information flows are critical to satisfying customers and creating competitive advantages. Organizations compete

globally by working with international suppliers, outsourcing, and marketing to consumers worldwide. This global reality places even more importance on successful supply chain management.

Successful SCM requires a change from managing individual functions to integrating activities into key supply chain processes (Li et al., 2006). In an example scenario, a purchasing department places orders as its requirements become known. The marketing department, responding to customer demand, communicates with several distributors and retailers as it attempts to determine ways to satisfy this demand. Information shared between supply chain partners can only be fully leveraged through process integration (Wong et al. 2005).

Supply chain business process integration involves collaborative work between buyers and suppliers, joint product development, common systems, and shared information. According to Lambert (2001), operating an integrated supply chain requires a continuous information flow. However, in many companies, management has concluded that optimizing product flows cannot be accomplished without implementing a process approach.

### **1.1.2 Organizational Performance**

Hamon (2003) views Performance Measurement (PM) as a critical factor for effective management. This stems from the reality that without measuring something, it is difficult to improve it. Hence, enhancing the organizational performance needs identifying and measuring the influence of SCM on it. However, the subject of performance does not receive sufficient compensation in supply chain management research.

Organizational performance can be measured by financial aims attainment or workers satisfaction. In the same manner Ho (2008) pointed out that performance can be evaluated by efficiency and effectiveness of aim attainment. Furthermore, Venkatraman et al (1986) cited that performance can be assessed by financial performance namely, return on investment, growth of sales, profit, organization effectiveness, and business performance. Similarly, Delaney et al (2006) assert that organization performance can be evaluated by quality service and products, satisfying customers, market performance, service innovations, and employee that organization performance can be appraised by the following “dimensions of performance: return of investment, margin on sales, capacity utilization, customer satisfaction and product quality”. In the same way, Green et al (2007) identified that return on investment, sales and market growth, and profit are important factors that be measured by organization performance. According to these researchers, there are many factors in this study that be measured by performance such as market shares, financial performance, efficiency and effectiveness of an organization performance, and human resource management.

### **1.1.3 Elevator Industry in Kenya**

The elevator industry in Kenya has over the last 20 years witnessed increased number of players with an initial 2 dominant players to the current 13 players. With unlimited number of buildings coming up annually that require the use of lifts or elevators and coupled with increased competition, it means that the level of competition has increased and the firms have had to develop new strategies and operations systems (Lambert (2001). The industry is under the regulation of a number of bodies and more specifically

the National Construction Authority and the Energy Regulatory Commission who ensure that the industry players operate within the set guidelines and safety measures developed. The Kenyan elevator industry players work with several stakeholders to the practice. These stakeholders that are involved at different stages include the developers, Electrical and Mechanical Consulting Engineers, Architects, Builders, Contractors, Lift Consultants, Inspectors, Governments Authorities namely NCA, ERC, Ministry of Housing and Urban Development and Ministry concerned with infrastructure. In order to operate in the competitive market, the players in the industry have had to develop close relationship with these players in sourcing of customers. Other competitive strategies employed include having a differentiated prices, product range, supply and installation delivery, warranty and maintenance services (Lambert, 2001). Further, employment and adoption of effective supply chain practices ranging from effective supply chain integration, information sharing, customer service management, geographical proximity and efficient just-in-time capability has come in to be a source of competitive advantage to the firms.

## **1.2 Statement of the Problem**

Some elevator problems like system downtime and slow operation are obvious. Others, such as high energy use and electrical noise generation, are not. Their impact, however, may be felt throughout the entire building. Understanding the nature and sources of and solutions to common elevator problems can help facility executives find the most cost effective ways to keep elevators performing well (Larson and Halldorsson, 2004). With



such challenges, the performance of elevator firms in developed countries may not match that of competitors in a developing country such as Kenya.

According to Narasimhan and Carter (2008), supply chain management is a cross functional approach that includes managing the movement of raw materials into an organization, certain aspects of the internal processing of materials into finished goods, and the movement of finished goods out of the organization and toward the end consumer. As organizations strive to focus on core competencies and becoming more flexible, they reduce their ownership of raw materials sources and distribution channels. These functions are increasingly being outsourced to other firms that can perform the activities better or more cost effectively. The effect is to increase the number of organizations involved in satisfying customer demand, while reducing managerial control of daily logistics operations. Less control and more supply chain partners led to the creation of the concept of supply chain management.

Several studies on promotional strategies have been carried out by various people. For instance Kyengo (2012) researched on Supply chain strategy and competitive advantage of Nation Media Group Ltd and found out that the overall performance of the organization is greatly influenced by the capacity of the firm to deliver products to the widely dispersed customers on time. Delayed delivery will affect the sales level and this can only be remedied by having an effective supply chain structures. Mwingi (2011) undertook a research on the effect of government regulation on supply chain performance of Oil marketing companies and found out that the performance of the Oil firms to fulfill

various customer demands or to improve the efficiency of a firm itself can be affected by regulations and there is need to develop a more robust customer relationship that help in reducing the lead times. Sandberg (2010) researched on green supply chain management practices of the Textile industry in Kenya and found that sharing promotional information between retailers and manufacturers is useful especially in the international market. It is evident that these studies did not focus on the effect of supply chain practice on performance of elevator firms thus creating a knowledge gap. Therefore there is need to bridge this gap by carrying out a study on the elevator firms in Nairobi to establish the effect of supply chain practices on performance

### **1.3 Research Objectives**

#### **1.3.1 General objective**

To determine the effect of supply chain management practices on performance of Elevator firms in Kenya.

#### **1.4 Value of the Study**

The understanding of the supply chain management practices adopted by elevator firms in Kenya helped policy makers' governments and other stakeholders to design targeted policies and programs that actively stimulated the growth and sustainability of the firms in the country.

On the other hand Regulatory bodies such as Energy Regulatory Commission, Ministry of Housing and Urban Development and the National Construction Authority used the study findings to improve on the framework for regulation.

The management and staff of the elevator firms also gained insight into how their institutions effectively managed their supply chain management practices. This study offered an understanding on the importance of adopting an efficient supply chain practices, and thus offer competitive advantage to the firms which eventually led to an increased in performance. Several practices on supply chain and their effects discussed for the benefit of the managers.

To academicians, the study also created a monograph which replicated in other sectors of the economy. Most importantly, this research contributed to the literature on the supply chain practices in firms especially in developing countries like Kenya. It is also hoped that the findings was valuable to the academicians, by offering research gaps that may stimulate interest in further research.

## **CHAPTER TWO : LITERATURE REVIEW**

### **2.1 Introduction**

The chapter provides information from publications on topics related to the research problem. It examines what various scholars and authors have said about the concept of supply chain management. This chapter presents the introduction, supply chain management theories and conceptual framework.

### **2.2 The SCOR Model**

The SCOR model covers the complete supply chain from order entry to paid invoice and may

involve many different units within a complete supply chain (Shell, 2006). The model is based on 5 core management processes namely Plan, Source, Make, Deliver and Return. These management processes are found in each of the units in the supply chain. The Plan covers demand and supply planning and management including amongst others plans for the whole supply chain, including Return and the execution processes Source, Make and Deliver. In relation to transport it will be the plans for the processes Source, Deliver and Return that will be the crucial processes. The management part of the Plan process includes the supply chain transportation.

The Source covers sourcing for different types of products, e.g. stocked, make-to-order and engineer-to-order. The process is the counterpart to the Deliver process of a unit upstream of the supply chain and has an interface to the transport world in those cases where the Deliver process uses a publicly available transport system. The Make covers

mainly production, testing and packaging of products to be transferred to the Deliver process. The process has minimal physical or information interface to the transport domain. The Deliver covers all order management steps from processing customer inquiries to routing shipments and selecting transport service providers. It also covers warehouse management, e.g. receiving and picking products to load and shipping products. The process Deliver is probably the SCOR process that is most relevant concerning the intersection between the supply chain domain and the transport interface to the transport domain ((Kopelman, Rosette, and Thompson, 2006).

## **2.3 Conceptual Framework**

A conceptual framework can be defined as a set of broad ideas and principles taken from relevant fields of enquiry and used to structure a subsequent presentation. The schematic diagrams below not only guided the study but also showed the inter relatedness among the key variables in the study as illustrated in Fig. 2.1 below.

### **2.3.1 Customer**

The customer starts the chain of events when they decide to purchase a product that has been offered for sale by a company. The customer contacts the sales department of the company, which enters the sales order for a specific quantity to be delivered on a specific date. If the product has to be manufactured, the sales order will include a requirement that needs to be fulfilled by the production facility (Haag, Cummings, McCubbrey, Pinsonneault, Donovan, (2006).

The customer service management process represents the company's face to the customer. It is the key point of contact for administering the PSAs developed by customer teams during the customer relationship management process (Halldorsson, Herbert Kotzab and Tage Skjott Larsen (2003). Customer service provides the customer with real time information on promised shipping dates and product availability through interfaces with such functional areas as manufacturing and logistics. The customer service process may also include assisting the customer with product applications.

According Hines (2004), customer relationship management (CRM) process provides the structure for how relationships with customers are developed and maintained. Through this process, management identifies key customers and customer groups to be targeted as part of the firm's business mission. The goal is to segment customers based on their value over time and to increase customer loyalty by providing customized products and services appropriate to the particular value proposition. Leaders in this process create cross functional customer teams to tailor product and service agreements (PSA) that meet the needs of key accounts and customer segments and document how the two firms will engage in business. The PSAs specify levels of performance for the firm. They also provide the basis for performance reports that measure the profitability of individual customers as well as the firm's financial impact on the customer's financial performance.

Just in time (JIT) purchasing emphasizes supplier evaluation based on product quality, delivery performance and price. Supplying defective items is not tolerated. In fact, Billesbach et al. (1991) found that a majority of respondents have evaluated their

suppliers based on delivery reliability and quality conformance. Under JIT purchasing, achieving product quality through a long term contract at a fair price receives the highest priority. Companies have placed high priority on quality and delivery in negotiation practices. However, they also rated response flexibility and competitive price reasonably high (Billesbach et al. 1991).

JIT purchasing differs from traditional purchasing in terms of the number of suppliers, the selection and evaluation of suppliers, and the negotiating and bidding process. Thus, suppliers have a considerable effect on the implementation of successful JIT purchasing (Fawcett and Birou 1993). Top management should make JIT purchasing a priority for the whole organization and clearly communicate this commitment to the employees. Fawcett and Birou (1993) stated that companies which successfully implement JIT purchasing activities provide support at different levels of management. Most importantly, purchasing people must be trained in the JIT philosophy.

Material requirements planning (MRP) is a computer based inventory management system designed to assist production managers in scheduling and placing orders for items of dependent demand. Dependent demand items are components of finished goods such as raw materials, component parts, and subassemblies for which the amount of inventory needed depends on the level of production of the final product. MRP works backward from a production plan for finished goods to develop requirements for components and raw materials (Haag, 2006). The inventory records file provides an accounting of how much inventory is already on hand or on order, and thus should be subtracted from the material requirements. The inventory records file is used to track information on the

status of each item by time period. This includes gross requirements, scheduled receipts, and the expected amount on hand.

Smaros et al., (2004) noted that production planners are users of MRP, as are production managers, who must balance workloads across departments and make decisions about scheduling work. Plant foremen, responsible for issuing work orders and maintaining production schedules, also rely heavily on MRP output. Other users include customer service representatives, who need to be able to provide projected delivery dates, purchasing managers, and inventory managers.

### **2.3.2 Information Technology**

The use of IT in SCM refers to the ways in which companies employ IT for the purposes of SCM. Transaction processing stands for the use of IT for increasing the efficiency of repetitive information exchanges between supply chain partners. In this type of IT use the exchanged information is typically related to such tasks as order processing, billing, delivery verification, generating and sending dispatch advices, and producing order quotes. The second type of IT use, supply chain planning and collaboration, represents the use of IT for sharing planning related information such as demand forecasts and other demand information, inventory information, and production capacity information, with the intention of increasing the effectiveness of the supply chain (Barry, 2003). IT use in SCM include order tracking and delivery coordination , refers to the monitoring of individual orders or shipments, which may consist of components or final products, with the aim of coordinating their delivery or conveying timely information of their location.



The advent of the internet and electronic communication has enabled companies to be more responsive to their customers than ever before. Sanchez and Peres (2003) assert that rich experience of firms with electronic resource planning (ERP) tend to deliver higher while the electronic data interchange (EDI) adopter perceive more operational benefits, more external pressures and mutual understanding, and fewer technical and organizational difficulties than non-adopters of EDI.

Information sharing practices such as vendor managed inventory (VMI) give manufacturers to more accurate demand information e.g. customer sales data than before. Smaros et al., (2004) used discrete event simulation to examine how a manufacturer can combine traditional order data available from VMI customers in its production and inventory control and what impact this has on the manufacturer's operational control. They found that even for products with stable demand a partial improvement of demand visibility can improve production and inventory control efficiency. The value of product visibility greatly depends on the target products' replenishment schedule and the planning cycle employed by the manufacturer.

### **2.3.3 Logistics**

Hines (2004) stated that finished product arrives in the warehouse, the shipping department determines the most efficient method to ship the products so that they are delivered on or before the date specified by the customer. When the goods are received by the customer, the company will send an invoice for the delivered products.

The mode choice aspect of these decisions is the more strategic ones. These are closely linked to the inventory decisions, since the best choice of mode is often found by trading off the cost of using the particular mode of transport with the indirect cost of inventory associated with that mode. While air shipments may be fast, reliable, and warrant lesser safety stocks, they are expensive (Mentzer et al. 2001). Shipping by sea or rail may be much cheaper, but they necessitate holding relatively large amounts of inventory to buffer against the inherent uncertainty associated with them. Therefore customer service levels and geographic location play vital roles in such decisions. Since transportation is more than 30 percent of the logistics costs, operating efficiently makes good economic sense. Shipment sizes, routing and scheduling of equipment are key in effective management of the firm's transport strategy.

Transport system is the most important economic activity among the components of business logistics systems. Around one third to two thirds of the expenses of enterprises' logistics costs are spent on transportation (Barry, Leonard and Parasuraman, 2003). In the logistics system, transportation cost could be regarded as a restriction of the objective market. Value of transportation varies with different industries. For those products with small volume, low weight and high value, transportation cost simply occupies a very small part of sale and is less regarded; for those big, heavy and low valued products, transportation occupies a very big part of sale and affects profits more, and therefore it is more regarded.

According to Seybold and Patricia (2001) transportation plays a connective role among the several steps that result in the conversion of resources into useful goods in the name of the ultimate consumer. It is the planning of all these functions and sub functions into a system of goods movement in order to minimize cost maximize service to the customers that constitutes the concept of business logistics. Traditionally these steps involved separate companies for production, storage, transportation, wholesaling, and retail sale, however basically, production/manufacturing plants, warehousing services, merchandising establishments are all about doing transportation. Production or manufacturing plants required the assembly of materials, components, and supplies, with or without storage, processing and material handling within the plant and plant inventory.

The role that transportation plays in logistics system is more complex than carrying goods for the proprietors. Its complexity can take effect only through highly quality management. By means of well handled transport system, goods could be sent to the right place at right time in order to satisfy customers' demands. It brings efficacy, and also it builds a bridge between producers and consumers. Therefore, transportation is the base of efficiency and economy in business logistics and expands other functions of logistics system. In addition, a good transport system performing in logistics activities brings benefits not only to service quality but also to company competitiveness (Lavassani and Movahedi, Kumar, 2009).

Within a firm's supply chain management, logistics is the work required to move and geographically position inventory. Logistics is the process that creates value by timing and positioning inventory. Logistics is the combination of a firm's order management, inventory, transportation, warehousing, materials handling, and packaging as integrated throughout a facility network. Integrated logistics serves to link and synchronize the overall supply chain as a continuous process and is essential for effective supply chain connectivity. While the purpose of logistical work has remained essentially the same over the decades, the way the work is performed continues to radically change.

### **2.3.4 Purchasing**

The purchasing department receives a list of raw materials and services required by the production department to complete the customer's orders. The purchasing department sends purchase orders to selected suppliers to deliver the necessary raw materials to the manufacturing site on the required date (Larson and Halldorsson, 2004). Once the user need has been recognized, the system will check to see if an approved supplier has already been entered into the database. In many cases, for a repetitive purchase, purchasing may have already negotiated a contract with the supplier, with established terms for delivery, pricing, quality and the supplier has already been entered into the accounting system.

According to Movahedi, Lavassani and Kumar (2009) potential evaluation of suppliers begins after determining that a purchase need exists and the development of material specifications occurs. For routine or standard product requirements with established or

selected suppliers, further supplier evaluation and selection is not necessary, and the approval process may be generated. However, potential sources for new items, especially those of a complex nature, require thorough investigation to be sure that purchasing evaluates only qualified suppliers.

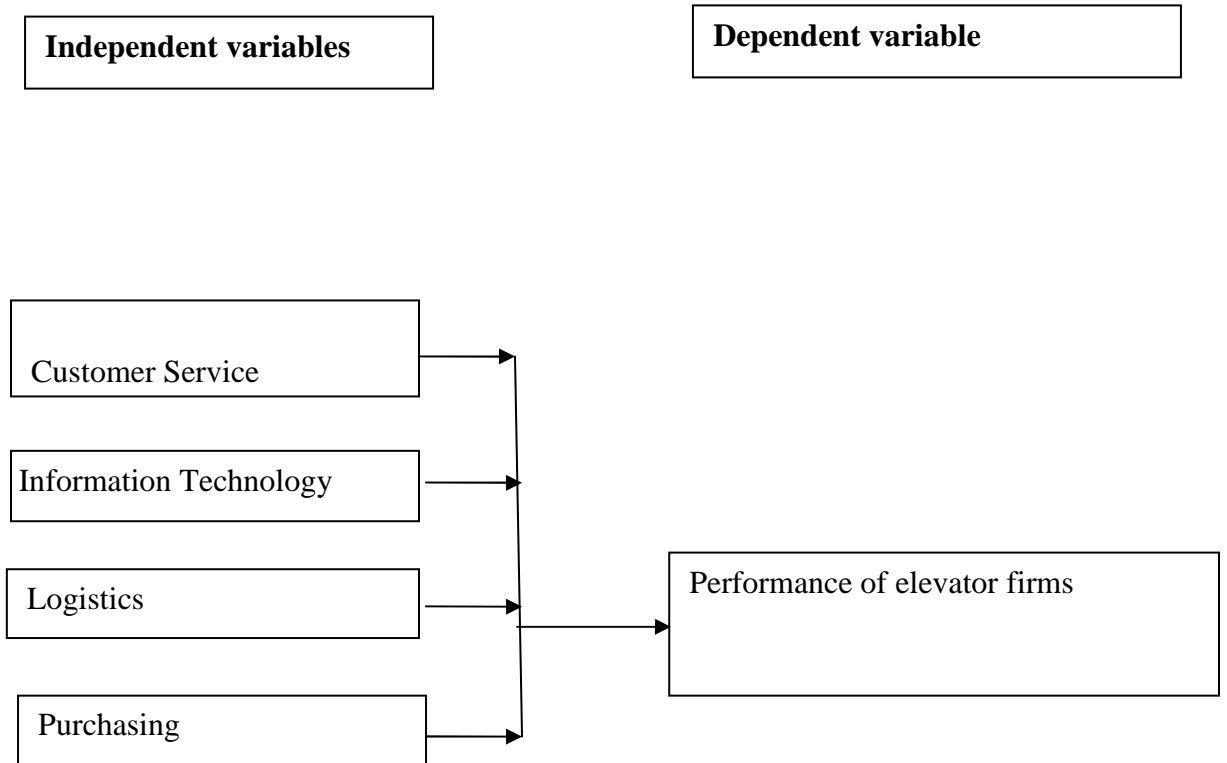
Supplier selection occurs once purchasing completes the activities required during the supplier evaluation process. Selecting suppliers is perhaps one of the most important activities performed by companies. Errors made during this part of the purchasing cycle can be damaging and long lasting. After bids have been received, and/or the negotiation has taken place, the sourcing team will select a supplier, and then move on to authorize the purchase through the purchase approval process (Mentzer et al. 2001).

After the supplier is selected or a requisition for a standard item is received, purchasing grants an approval to purchase the product or service. This is accomplished through an electronic drafting of a purchase order (PO), sometimes called a purchase agreement, after supplier selection is complete. Purchasing must take great care when wording a purchase agreement because it is a legally binding document. Almost all purchase orders include the standard legal conditions that the order is subject to on the reverse side of the agreement (Kaminsky and Simchi levi, 2007). The purchase order details critical information about the purchase, quantity, material specification, quality requirements, price, delivery date, method of delivery, ship to address, purchase order number, and order due date. Note that firms are increasingly using computerized databases to perform these processes, and are moving toward a paperless office.

Lambert, Douglas and Tetrance Pohlen (2001) indicated that the phase of the purchasing cycle involves the physical transmittal of purchase requirements. This should be a fairly routine, although not necessarily the most efficient, part of the purchasing cycle. Some organizations transmit orders electronically, while others send material releases through the mail or by fax. Electronic data interchange (EDI), which involves the electronic transfer of purchase documents between the buyer and seller, can help shorten order cycle time. EDI transactions, particularly through the Internet, will increase over the next several years. The shipping and receiving processes require several other important documents, including the material packing slip, the bill of lading, and the receiving discrepancy report.

Supplier measurement and management is a key part of the purchasing cycle. The buyers should not assume that the purchasing cycle ends with the receipt of an ordered item or the selection of a supplier. Continuous measurement is necessary to identify improvement opportunities or supplier nonperformance. A desired outcome from performance measurement is improved supplier performance. If no formal evaluation takes place, a buyer has little insight into supplier performance over time, and tracking any performance improvement that results from supplier development efforts is not possible. Without a measurement and evaluation system, a buyer lacks the quantitative data necessary to support future purchase decisions (Barry, Leonard and Parasuraman, 2003).

**Figure 2.1 Schematic diagram showing variable relationships**



**Source: Author (2013)**

Performance of firms depends on the profitability of individual customers, as well as the firm's financial impact on the customer's financial performance, increasing the efficiency of repetitive information exchanges between supply chain partners, material specification, quality requirements, price, delivery date, method of delivery and effective supply chain connectivity.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

This chapter presents the research methodology that was used to carry out the survey, what informed the selection of the research design, the target population, sampling method to be used, data collection instrument and how data was analyzed, interpreted and presented.

### **3.2 Research Design**

A research design was descriptive survey design used to establish the effect of supply chain management practices in the performance of elevator firms in Kenya. This design was considered appropriate since it allowed the researcher to draw conclusion on the link between supply chain management practices and performance. A descriptive research designed was also adopted in the study because the study concerned about a univariate question in which the researchers was ask questions about the size, form, distribution and existence of supply chain management practices on performance of firms in the elevator industry (Chege, 2012). This permitted the researcher to make statistical inference on the broader population and generalized the findings to real life situations and thereby increases the external validity of the study.

### **3.3 Population**

The target population was all the elevator firms in Kenya which are 13 in number (Appendix II). Given the relatively small number, a census method was conducted.



### **3.4 Data Collection**

Primary data was collected by means of semi structured questionnaire. The primary data was collected using a questionnaire that was administered on a “drop and pick later” method to the procurement manager, finance manager, project manager and site manager. The questionnaire had three parts; Part A sought data on the background information of the responded and part B sought data on the supply chain management practices. The questionnaire allowed greater uniformity in the way questions were asked, ensuring greater compatibility in the responses. The use of closed ended questions on the questionnaire allowed for uniformity of responses to questions; while unstructured (close ended) questions gave the respondent freedom of response which helped the researcher to gauge the feelings of the respondent.

### **3.5 Data Analysis**

Data analysis procedure is the process of packaging the collected information and putting them in order and structuring its main components in a way that the findings can be easily and effectively communicated Delno (2006). The data was analyzed using qualitative and quantitative techniques. Qualitative method involved content analysis and evaluation of text material. Quantitative method involved the use of regression analysis.

The functional relationship was shown by using the multiple regression equation which takes the form:

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4$$

Where:

Y = Performance of elevator firms

$\beta_0$  = Y Intercept

$x_1$  = Customer service

$x_2$  = Information technology

$x_3$  = Logistics

$x_4$  = Purchasing

Two methods of data analysis were applied in this study. One method was correlation models specifically Pearson correlation to measure the degree of association between different variables under consideration. The other method was multiple regression analysis that estimated the causal relationships between stock beta and other chosen variables. Correlation was used to measure the degree of association between different variables under consideration. Pearson correlation analysis was used for data analysis to see the relationship between variables such as customer service, information technology, logistics and purchasing. If efficient supply chain management practices stock beta, one expects a positive relationship between the practices of supply chain management and performance of elevator firms.

## CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSION

### 4.1 Introduction

This chapter presents the data analysis and interpretation of results on the effect of supply chain management practices on performance of firms in the elevator industry in Kenya. Data was collected from Procurement Managers, Finance Managers, project manager and Site Manager who were in charge of supply chain functions in the respective elevator firms. The findings are presented next.

### 4.2 Response Rate

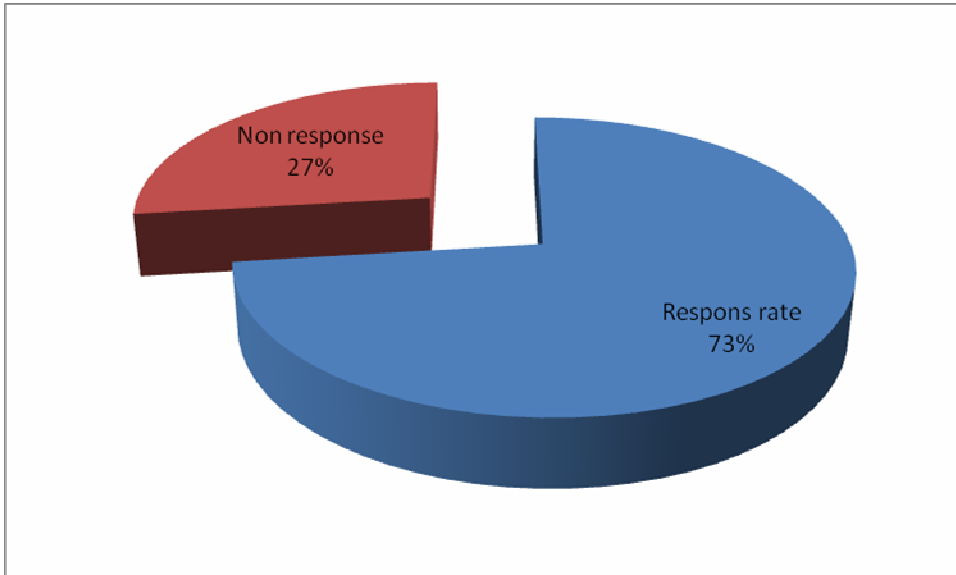
Out of 52 targeted respondents, only 38 responded which constituted 73% of the sample. The response rate of 73% was considered sufficient to yield meaningful statistical analysis. The respondents who did not respond gave various reasons including sensitivity of information requested; few senior officers released information, while others feared misuse of the information requested.

**Table 4.1: Response rate**

Population	Number of targeted Population	Returned questionnaires	Percentage
Elevator firms	52	38	73

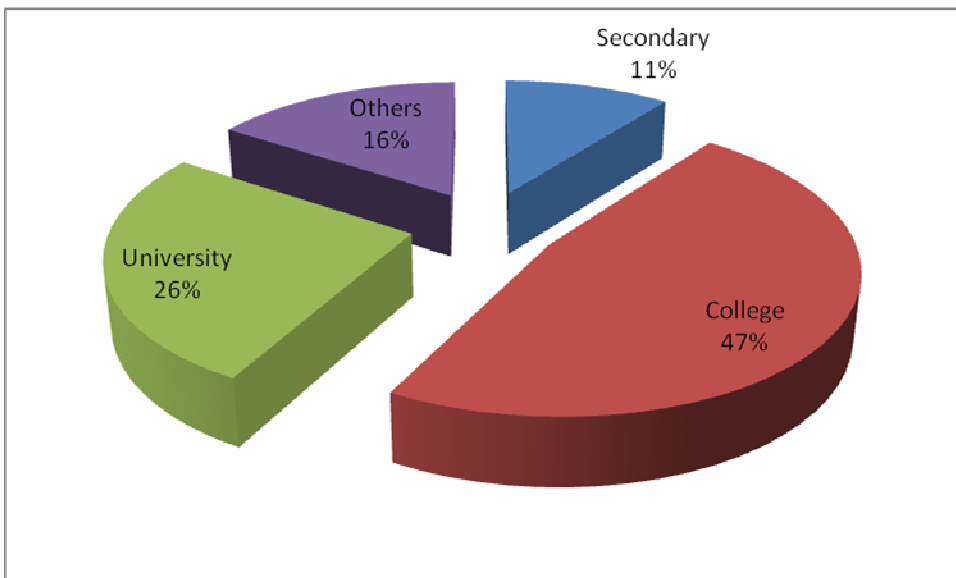
**Source: Author (2013)**

**Figure 4.1: Response rate**



Source: Author (2013)

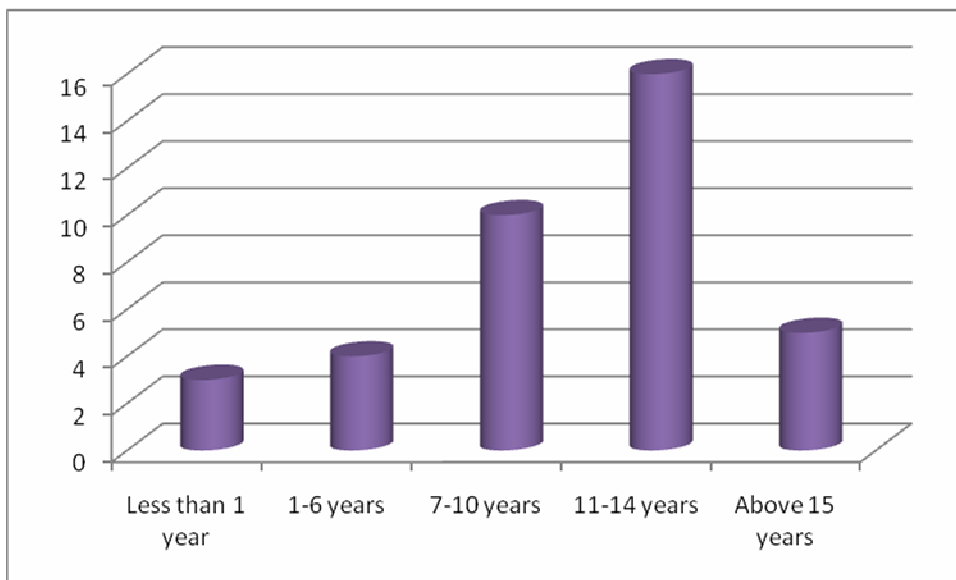
**Figure 4.2: Respondents level of education**



Source: Author (2013)

Figure 4.2 above shows how respondents rated their level of education. The study findings indicated that 11% were secondary graduates, 47% of the respondents were college graduates while 26% of respondents were university graduates and 16% of the total respondents have other qualifications not mentioned in this study. This indicated that the majority of respondents were graduates from college and university; hence most of the employees are learned and can perform well in their jobs.

**Figure 4.3: Level of work experience**



Source: Author (2013)

The presentation shown on figure 4.3 was based on the need to establish the work experience of the respondents. As shown above, 5% of the respondents had work experience of below 1 year, 10% had work experience of between 1-6 years, 26% had work experience of between 7-10 years, 46% had a work experience of between 11-14 years and 13% had over 15 years work experience, it can be established that majority of

the respondents have worked for their distributors between a period of between 7-10 years.

### 4.3 Summary Statistics

Descriptive analysis presents the minimum values, maximum values, mean and standard deviation of the different variables in the study.

**Table 4.2 Descriptive statistics**

	N	Minimum	Maximum	Mean	Std. Deviation
y	52	7.00	14.00	10.4615	2.10616
X <sub>1</sub>	52	2.60	3.59	3.1508	.34594
X <sub>2</sub>	52	1.90	26.30	9.3308	6.10306
X <sub>3</sub>	52	2.80	3.50	3.0923	.2362
X <sub>4</sub>	52	1.60	2.43	3.0046	.4168
Valid N (list wise)	52				

Source: Author (2013)

To check the relationship of the variables with beta, natural logarithm of data was used as control variable. The mean log of customer service was 3.1 while the standard deviation was 0.34. The maximum value of the log of customer service for performance of elevator firms was 3.59 and the minimum value was 2.6. In the same way to check information technology, the mean log was 9.3 and standard deviation was 6.1. The maximum value was 26.3 of the log of information and the minimum value was 1.9.

To determine logistics and its relationship with the beta, the logistics was used as a control variable. From the results the average logistics for the elevator firms was 3.09 with a standard deviation of 0.23. The maximum logistic used by the firms was 3.5 while the minimum level of logistics was 2.8. To establish purchasing and its relationship with beta, the purchasing mean was 3.0 with a standard deviation of 0.4. The maximum value was 2.43 of the log of purchasing and the minimum value was 1.6.

## **4.4 Customer service, I.T, Logistics and Purchasing**

### **4.4.1 Results of Correlation Analysis**

Correlation analysis shows the statistical relationship of the variables in the study.

**Table 4.3 Results of correlation analysis**

	Y	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>	X <sub>4</sub>
Y Pearson Correlation Sig.(2-tailed)	1				
X <sub>1</sub> Pearson Correlation Sig. (2-tailed)	.697 .008	1			
X <sub>2</sub> Pearson Correlation Sig. (2-tailed)	-.055 .858	.288 .340	1		
X <sub>3</sub> Pearson Correlation Sig. (2-tailed)	.209 .494	.274 .364	1		
X <sub>4</sub> Pearson Correlation Sig. (2-tailed)	.312 .450	.328 .390	.335 .305	.367 .284	1

**Source: Author (2013)**

A correlation analysis was carried out among the variables and the results are as shown on the table 4.3. The correlation between customer service and organization performance



is 0.697 and at the significance level of 5%, this is statistically significant since its P-value is 0.8%. The other independent variables do not have a significant correlation since their P-values are higher than 5% ( $X_2 = 85.8\%$   $X_3 = 49.4\%$   $X_4 = 45\%$ )

#### 4.4.2 Regression Analysis Results

Regression analysis was carried out and the results are summarized in table 4.4

**Table 4.4 Regression analysis results**

del	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-4.152	6.721		-.618	.552
X <sub>1</sub>	4.691	1.458	.770	3.218	.011
X <sub>2</sub>	-.097	.080	-.280	-1.209	.258
X <sub>3</sub>	.238	2.056	.027	.116	.911
X <sub>4</sub>	.308	1.006	.019	.230	.685

**Source: Author (2013)**

The regression model is:  $Y = -4.152 + 4.691 X_1 - 0.097 X_2 + 0.238 X_3 + 0.308 X_4$ , where  $X_1$  is customer service,  $X_2$  is Information Technology,  $X_3$  is Logistics and  $X_4$  is Purchasing. Using a significance level of 5%, any variable having a P-value (Significance) greater than 5% is not statistically significant. These are  $X_2$  (25.8%),  $X_3$  (91.1 %) and  $X_4$  (68.5%).

Only  $x_1$  is statistically significant (1.1%). Thus only customer service in this study is found to be a suitable predictor of performance of elevator firms.

#### 4.4.3 Model Fitness Results

**Table 4.5 Model fitness results**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.747	.558	.411	1.61672

**Source: Author (2013)**

Table 4.5 provides the coefficient of determination which is 55.8%. Thus, 55.8% of the variation in the performance of elevator firms is explained by the considered independent variables, which is moderate.

#### 4.4.4 Results of Analysis of Variance

**Table 4.6 Results of analysis of variance**

##### ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29.707	3	9.902	3.789	.052
	Residual	23.524	9	2.614		
	Total	53.231	12			

**Source: Author (2013)**

Table 4.6 summarizes the results of an F-test. For numerator df  $V_1 = 3$ , denominator df,  $V_2 = 9$  and  $\alpha = 5\%$ , the critical F value is 3.86. The computed F value is 3.789 meaning that the overall model is not statistically significant. This is further supported by the P-value of 5.2%, which is larger than 5%. This means that it is not a suitable prediction model for explaining the relationship between the supply chain practices and organization performance. This contradicts the findings by Barry (2003) that indicates the effectiveness of supply chain depends on the usage of IT to share information and form partnership to make the firms competitive in the market. It also contradicts the findings by Hines (2004) who found that customer relationship is essential in tailoring product and service agreements which specify level of performance for the firm.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter presents the summary and conclusions of the study that was carried out on Supply Chain Management Practices and performance of firms in the elevator industry in Kenya. The objective of the study was to determine the effect of supply chain management practices on performance of Elevator Firms in Kenya. The recommendations, findings and suggestions for further research based on the objective are presented next.

#### **5.2 Summary of the Study**

The regression model was not found to be statistically significant.

Nevertheless, the study showed that most elevator firms do not provide real time information to their customers. The study confirmed that most firms in Kenya have loyal customers since it is difficult to shift to another elevator firm after installation. The study established that most firms do not practice just in time and material requirement planning practices. The results therefore indicated that there is a degree of negative relationship between elevator firm's performances on customer service. This was attributed to lack of real time information, time taken for repairs and maintenance of elevator firms in Kenya. This is in line with Haag (2006) who stated that firms who do not provide good customer service does not perform in the market.

The study indicated that delivery verification by most elevator firms in Kenya is timely. The study confirms that IT use in SCM include order tracking and delivery coordination, monitoring of individual orders or shipments, which may consist of components or final products, with the aim of coordinating their delivery or conveying timely information of their location. It was established that elevator firms use IT in billing their customers. It has been confirmed by Sanchez and Peres (2003) the use of IT for sharing planning related information such as demand forecasts and other demand information, inventory information, and production capacity information, with the intention of increasing the effectiveness of the supply chain management practices.

The study established that service delivery by elevator firms in Kenya is poor due to constant delays in order delivery. It also showed that the prices of most firms are too high due to tax tariff levied on their services. In addition the study confirmed that elevator firms provide quality manufacturing. This confirms the argument by Barry (2003) that customers require purchases order details critical information about purchase, quantity, material specification, quality requirements, price, delivery date, method of delivery, ship to address, purchase order number, and order due date in order to make a purchase.

The study revealed that material handling by elevator firms is a key effective management strategy. It was also established that transportation plays a connective role among several steps that result in the conversion of resources into useful goods in the name of the ultimate consumer. The study confirmed that warehousing by most elevator

firms is effective to store materials purchased for a later use. According to Seybold and Patricia (2001) confirms that transportation is the base of efficiency and economy in business logistics and expands other functions of logistics system. In addition, a good transport system performing in logistics activities brings benefits not only to service quality but also to company competitiveness.

### **5.3 Conclusions**

Several conclusions can be drawn from the findings of this study. First, supply chain management practices have a negative impact on elevator firm's performance especially where service delivery is poor, mismanagement and corruption abounds.

Secondly, pricing is negatively related to firm's performance. This is attributed to the negative impact of local taxes on the development and maintenance of high valued machines. The level of service rendered to the public by the some elevator firms does not represent value for money paid due to poor materials. Furthermore, most elevator firms are poorly maintained and often in dilapidated status. Hence, their performance is very low even though building values have been rapidly rising.

Thirdly, the study also found a positive impact on real time information, reverse logistics, warehousing, monitoring orders and JIT since they increase value to the basic services of elevator firms and its neighborhoods.

## **5.4 Recommendations**

Based on the above, it was recommended that elevator firms should incorporate customer service as a supply chain management practice to all departments because they work towards achieving the overall performance of the firms. There should be a clear policy on the repairs and maintenance practices as there are some firms which take long to provide repairs and maintenance.

## **5.5 Limitations of the Study**

The perception of the respondents was a major limitation, confidentiality and sensitivity of the data was another limitation. This made many respondents suspicious and did not trust the researcher. They thought the study aims to use the findings against them. Thus many gave misleading information hence complete reliance on secondary data in this study.

Elevators firms are usually very busy place. Some respondents showed signs of declining the researcher's advances by failing to cooperate fully as expected, citing that they are having a tight schedule.

The researcher also encountered problems in eliciting information from the respondents as the information required was subject to areas of emotions, attitudes and perceptions, which could not be accurately quantified and verified objectively.

There was also bureaucracy in getting approval to carryout research in the elevator firms. Written approval had to be sought from the Managing Directors of some firms and this

resulted in time delays. However, despite all these limitations the response rate was good at 73%.

## **5.6 Suggestions for Further Research**

This study focused on effects of supply chain management practices on performance of elevator performance in Kenya. Further research could be carried on the influence of supply chain management practices on performance of elevator firms in other regions in East Africa; there are other supply chain management practices that are different from the ones identified in this study which include outsourcing.

Future studies should also set aside adequate time to conduct interviews and search the secondary sources of data available at the elevator firms.



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# Appendix I: Questionnaire

## Section A

### Background Information

Please answer these questions. Your participation will be highly appreciated.

1 Please indicate your position in this company.....

2. Please indicate your highest level of education

- a) Secondary ( )
- b) College ( )
- c) University ( )
- d) Other Qualification ( )

3. How long have you been in this organization?

- a) Less than 1 year ( )
- b) 1-6 years ( )
- c) 7-10 years ( )
- d) 11-14 years ( )
- e) Above 15 years ( )

## SECTION B

### Supply chain management practices

5. Rate the extent to which the following supply chain management practices affect your organization performance (*please tick as appropriate*):

### Customer Service

	Not at all	Less extent	Moderate extent	Great extent	Large extent
Real time information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Product availability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Loyalty	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
JIT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MRP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Purchasing

	Not at all	Less extent	Moderate extent	Great extent	Large extent
Delivery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pricing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of material	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Logistics

	Not at all	Less extent	Moderate extent	Great extent	Large extent
Material handling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Packaging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transportation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Warehousing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reverse Logistics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Route Planning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Consolidation of cargo	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Information Technology**

	Not at all	Less extent	Moderate extent	Great extent	Large extent
Delivery verification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Billing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Monitoring orders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ERP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EDI	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Any other *(please specify below)*

	Not at all	Less extent	Moderate extent	Great extent	Large extent
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Thank you!**



## **Appendix II: Major players in industry**

1. Schindler Elevators (K) Ltd - Schindler
2. Marryat and Scott (K) Ltd - KONE
3. East African Elevators (K) Ltd – OTIS
4. Mits Electrical Co Ltd – Mitsubishi
5. V-Technical Co Ltd – Giant
6. Kenya Lift Co. Ltd – Hauslift
7. Elevonics Lift Services - Brilliant
8. AJE Elevators Eng. Company Ltd – Sanyo Wuxi
9. Elevator General Services Ltd -
10. Fujiga Elevators Co. Ltd - Fuji
11. Elecon Lift Company
12. Ultra – Webstar/ Macpuawa (MP)/ Fujitec
13. Shanghai Electrical – Mitsubishi

**Source;** <http://www.yellowpageskenya.com> downloaded on 19<sup>th</sup> July, 2013