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## INFLUENCE OF SUPPLY CHAIN PRACTICES ON PERFORMANCE OF LARGE MANUFACTURING FIRMS IN KENYA

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### ABSTRACT

This study examined the influence of supply chain practices on performance of large manufacturing firms. The specific objectives of the study was to assess the influence of information communication technology on firm's performance, determine the influence of order processing management on performance, examine the influence of vendor relationship management on performance and to explore the influence of inventory management systems on performance of large manufacturing firms. The research used descriptive research design. The target population for the study was 355 employees in the large manufacturing firms in Kenya. The study population was large manufacturing firms registered by Kenya association of manufacturers (KAM) 2016 and respondents was designated heads of supply chain of these firms. A sample population of 188 was selected by using Slovin's formula. Questionnaires were administered through both e-mails and hand delivery. Secondary data was obtained from both published and unpublished records. Questionnaires was tested for both reliability and validity. Qualitative and quantitative techniques was used to analyze data with the assistance of SPSS software program version 22. A good response rate of 71.2% was realized. It was established that most of the supply chain practices indicators have positive impact on performance of the firm. The study further adopted a regression analysis to determine the relationship between the variables at 5% confidence level of significance. The study findings showed that the four variables had a significant influence on performance of the firms. The study recommended that a similar research should be conducted in a different field. The findings showed that 70.8 % of the performance is explained by the four variables while 29.2 can be accounted by other factors captured by the standard error.

**Key Words:** Information Communication Technology, Order Processing Management, Vendor Relationship Management, Inventory Management Systems

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## INTRODUCTION

Organizations are keen to managing supplies through supply chain practices, as a step towards minimizing operational costs, managing social, environmental and economic reputations of supply chains. In order for an organization to survive and be effective in meeting their market demand, the organization must be cognizant of its supply chain management for better performance and sustained survival (Hasan, 2013). Supply chain management aims at efficient management purchasing, storage and use of the materials. Supply chain practices play a major role in the operation of many businesses and manufacturing companies.

In manufacturing sector, increased raw materials costs, underperforming vendors and uneconomical relations have been an order of the day (Kumar, 2013). Competitiveness is a strategy that defines the set of customer needs that it seeks to satisfy through its products and services. Competitive strategy targets one or more customer segments and aims to provide products and services that will satisfy these customers' needs (Seth & Randall, 2005). Supply chain management involves ensuring a constant supply of stock to avoid stock out and have uninterrupted sales and efficient customer service, maintaining sufficient stock, controlling investment in inventories by keeping at an optimum level of production while minimizing carrying costs and time (Bore, 2007). The objective of effective supply chain management practices is to ensure sufficient level of stock which maintains an acceptable level of available demand while minimizing the related holding, administrative and stock out cost. Several activities are undertaken within the sphere of supply chain management, these include purchasing, classification, inspection, codification, store keeping and stock taking which include stock control (Sharma, 2011).

Supply chain practices is a huge determinant for the prosperity or downfall of a business. For a huge reduction of investment in working capital and exceptional operational performance, the organized management and orderly control of supply chain

assist in it all. Thus, according to Rao, (2006) the overall calculated business objective should be supply chain management since it has a remarkable capacity on profitability. This is further expounded by Zhu, Sarkis & Lai, and (2007) who states that well established supply chain management levels outcomes by intensifying competitive ability and market share of firms. Companies can experience high-ranking competition and high-level of financial performance from correctly controlled supply chain practices Melnyk *et.al*, (2010). This also ensures the development of a firm and prosperity as the product quality is intertwined to the product volume sold and overall firm's profit.

In present day supply chain, holding and warehousing inventory is an important role for a firm. Logistic costs survey in Europe identified the inventory cost to be 13 percent (%) of entire logistic costs, 24 percent (%) was accounted for supply chain practices, Rao, (2006). Nonetheless, to determine supplies costs and to control purchase in most instances may not be able to curb purchasing costs in a similar manner to the industry which is competitive. Supply chain management practices provides great potential for firms to reduce costs and improve customer service performance, Kumar, (2013).

In the western countries, there have been a decline in performance of manufacturing industry. In Europe and particularly in Australia, its total contribution to the GDP is less than half of what it was four decades ago. This was as a result of poor strategic supply chain management systems leading to increased cost of production resulting to the gross operating profit margins for the manufacturing firms falling from 9.5% in 2013 to 7.8% in the year 2014 (Omonge, 2012). Similarly, in Africa, performance of the manufacturing sector has been poor over the last two decades.

Supply chain management is a delicate task that requires a proper knowledge of the matter in order to effectively and efficiently respond to customers' expectations. For Sari (2010), customer service requirements command the structures of the

supply chain, including manufacturing, marketing and logistics and to understand how such requirements are a step to meet customer satisfaction. According to available studies in America, supply chain contributes sixty percent (60%) of the annual turnover in manufacturing firms (Anderson, 1987). This clearly shows that a lot of concern should be given to inventory management to avoid unnecessary costs. Being a key function in any manufacturing firm accounting for over half of its receipts, it certainly deserves a great deal of managerial attention. In other words, organizations earn or loose large sums depending on how effective their supply chain is managed (Ramakrishma, 2005).

According to the Supply chain digest (Gilmore, 2011), the data analysis on supplies show continued upward pressure on supply chain levels, with average inventories across all industry sector up by 2.5% in 2010. The largest driver of this increase is thought to be the rise in off shoring. Due to this increase the level of supply chain rise as higher inventories are used to buffer the impact of longer supply chains and increased inventory risk. Lewin (2012) observed that the extent of emphasis on inventories among American firms reached the financial markets where there were rules favoring firms that controlled supplies and punishing those that did not do so. In recent years, a good number of manufacturing firms have faced numerous challenges where there have been cases of materials overstocking which eventually get expired or rendered obsolete, under stocking, lack of stock taking, theft of materials by employees, delays in deliveries of materials into the firms among others.

Africas supply chains are struggling. Recent years have seen numerous global and regional supply collapse under increased raw material costs, underperforming supplies, uneconomical outsourced relationship and changing customer demands and Africa have not seen immune. While technology has, to a large extent rescued supply chains from becoming ineffective the low maturity and sparse of technology among Africa nations has

undermined the confidence of supply chains leaders and stakeholders. Africas supply chain leaders need to uncover innovative ways of achieving the supply chain goals and objectives.

According to Ondiek, (2010), supply chain plays a big part in manufacturing firms as it accounts for about 57% of the annual turnover. Kenyan firms are faced with a lot of competition in the market. This has led to the companies coming up with strategies of managing and evaluating how resources are utilized by various jobs or products to eliminate any wastage in the value chain (Norah, 2017). The major concern is how inventory functions are organized and who is responsible over this function in the Kenyan manufacturing firms. An increased emphasis has been on competitiveness and competitive advantages through effective utilization of organizational resources. Firms have tried to achieve these through, competitive buying, buying wisely, effective and reliable sources of supply, keeping supplies investment and supply costs at practical minimum (Nyabwaga, 2012).

Ojera (2012) observed that too much inventory consumes physical space, creates a financial burden, increase the possibility of damage, spoilage and loss. On the other hand, too little inventory often disrupts business operations, lead to lost business thus resulting to poor performance among manufacturing firms. According to Dimitrios (2010), Kenya manufacturing firms face problems of poor implementation of supply chain practices due to inadequate organization culture, lack of stakeholder's cooperation, resources inadequacy and government policies. Due to rapidly changing business environment, manufacturing firms need to have sound, effective and well – coordinated supply chain management systems. With proper supply chain management systems in place in manufacturing firms, the right environmentally friendly materials will be available at the right time, within minimum storage costs and minimal investment.

### **Statement of the problem**

Kenya is the most industrially developed country in East Africa, but it has not yet produced results to match its potential (UNIDO, 2004). The business environment in which Manufacturing firms currently operate is dynamic and turbulent with constant and fast paced changes that often render yester-years practices irrelevant (Monday, Akinola, Ologbenla, & Aladeraji, 2015). According to Mahmoud (2014), the hypercompetitive business environment has pushed manufacturing firms to limits dictating the need to adopt supply chain management practices that support decisions, plans and choices that will lead to competitive advantage and enhanced profitability and value creation. Supply chain management practices addresses the question of why some organizations succeed while others fail, and it covers the causes for company's success or failure (Hill, Jones and Schilling, 2014).

Manufacturing firms in Kenya experiences serious setbacks in the execution of supply chain practices due to poor or defective implementation strategies (KNBS, 2018). Supply chain covers 15% of the entire organizational budget, however out of that, 5% goes to waste due to returns, obsolete, pilferage and rework caused by the defective items (KNBS, 2018). With increased competitions and interest in environmentally friendly products, Supply chain practices is becoming increasingly important tactics and strategies used by most firms.

According to World Bank report (2016) the government spends roughly 230 billion annually on supply chain process. However, the government loses about 120 billion due to inflated supply chain quotation, poor production process, and increase in waste products as a result of poor implementation of supply chain practices. Manufacturing firms have been forced to embrace supply chain practices due to persistent pressure from the stakeholders such as customers, shareholders and non-profit organizations. However, despite all the attempts to adopt sufficient supply chain practices, most firms have been faced by various setbacks.

Several studies have been done to show the challenges and determinants of implementing supply chain practices in an organization. Faith (2016) found out that embracing supply chain practices led to reduction of environmental impacts, reduction in hazardous and no hazardous waste products and improved performance. Wilfred (2014) carried out a study on the effect of the supply chain practices on organizational performance in the seven-up bottling company in Nigeria where he came up with the conclusion that organizations benefits from supply chain practices by way of easy storage and retrieval of material, improved sales effectiveness and reduced operational cost. Wasonga (2014) undertook a study on ascertaining the extent to which supply chain practices is implemented in Kenyan supermarket. The findings revealed that the adopted had been done to a low extent.

The study sought to fill the knowledge gap by examining out if electronic supply chain practices, Order process Management, vendor relationship management and inventory management systems influences performance of large manufacturing firms in Kenya.

### **Objective of the Study**

The general objective of this study was to establish the influence of supply chain practices on performance in large manufacturing firms in Kenya. The specific objectives were;

- To assess the influence of information communication technology on the performance of large manufacturing firms in Kenya.
- To determine the influence of order processing management on the performance of large manufacturing firms in Kenya.
- To examine the influence of Vendor relationship management on the performance of large manufacturing firms in Kenya.
- To explore the influence of Inventory management system on the performance of large manufacturing firms in Kenya.

## LITERATURE REVIEW

### Theory of Strategic Balancing

Strategic balancing is based on the principle that the strategy of a company is partly equivalent to the strategy of an individual. Indeed, the performance of companies is influenced by the actors' behavior, including the system of leaders' values. Further to an empirical study on technological alliances, Aliouat and Boualem, (2017) deduced the principle of the strategic balancing according to which a technological alliance generates paradoxes and lives by its paradoxes.

An alliance wavers between multiple antagonistic poles that represent cooperation and competition. This gives room to various configurations of alliances, which disappear only if the alliance swings towards a majority of poles of confrontation (Aliouat and Boualem, 2017). The strategic balancing gathers three models, namely the relational, symbiotic and deployment models. Competition proves to be part of the relational model and the model of deployment. It can be subject to alternation between the two antagonistic strategies, the one being predominantly cooperative as described by the relational model and the other being predominantly competing as characterized by the model of deployment. The company can then take turns at adopting the two strategies in order to keep their alliance balanced. This idea is very close to that of Bengtsson and Kock (2000) according to whom there are three types of competitive relationships: competition dominated, cooperation-dominated, and equal relationships. The latter is similar to the alternation between the relational model and the model of deployment described by (Aliouat, 2006). The theory is in line with the objective on effect of Information technology adoption on performance in large manufacturing firms

### Resource Based View

Introduction of the theory of RBV is attributed to Birger Wernerfelt (1984). The theory describes organization in terms of its capabilities or resources add to a more comprehensive understanding of the

firm's core functions and sources of potential. The basis of RBV theory is primarily focused on internal organizational factors as Barney (1991) explains firms cannot purchase sustained competitive advantages on an open market and must find these advantages within its owned resource pool. The main elements of the resource-based theory may be summarized as follows: ((Grant, 2001) enterprises are collections of resources and capabilities; the effectiveness of an enterprise depends on the balance between resources and capabilities, on one side, and customer demands, on the other; the growth of an enterprise is limited by its resources and capabilities; competitive advantage is based on capabilities which are irreproducible or reproducible only with substantial difficulty.

According to Lee (2015), organization that understands the balance between its core resources and the supporting resources required from external sources has an advantage over an organization fixated on maximizing self-sufficiency. A key aspect of the RBV which relates to the supply chain of resources is the relative value of the resource to the organization. Firms must be mindful of the risk associated with procuring resources which deviate from organizational goals which affects the service delivery (Roy & Khokhle, 2011). Acquiring resources misaligned with organizational goals wastes financial resources that can be used for procuring valuable capabilities, dilutes the effectiveness of established core resources, and potentially shifts an organizations focus from implementing resources to the sole process of resource collection. According to Ray *et al*, (2004) supply chain policy should always support supply chain of resources that have potential of enhancing service delivery to customers.

### Systems Theory

This theory was developed by Yourdon in 1989. Yourdon (1989) used the theory in the field of information technology to show how adaptability of any theory changes as per the enhancement of the system structure. General System Theory focuses

on the system's structure instead of the system's function. It suggests that complex systems have common basic organizing principles irrespective of their purposes which are in exchange and are bounded (Zeng, & Pathak, 2013).

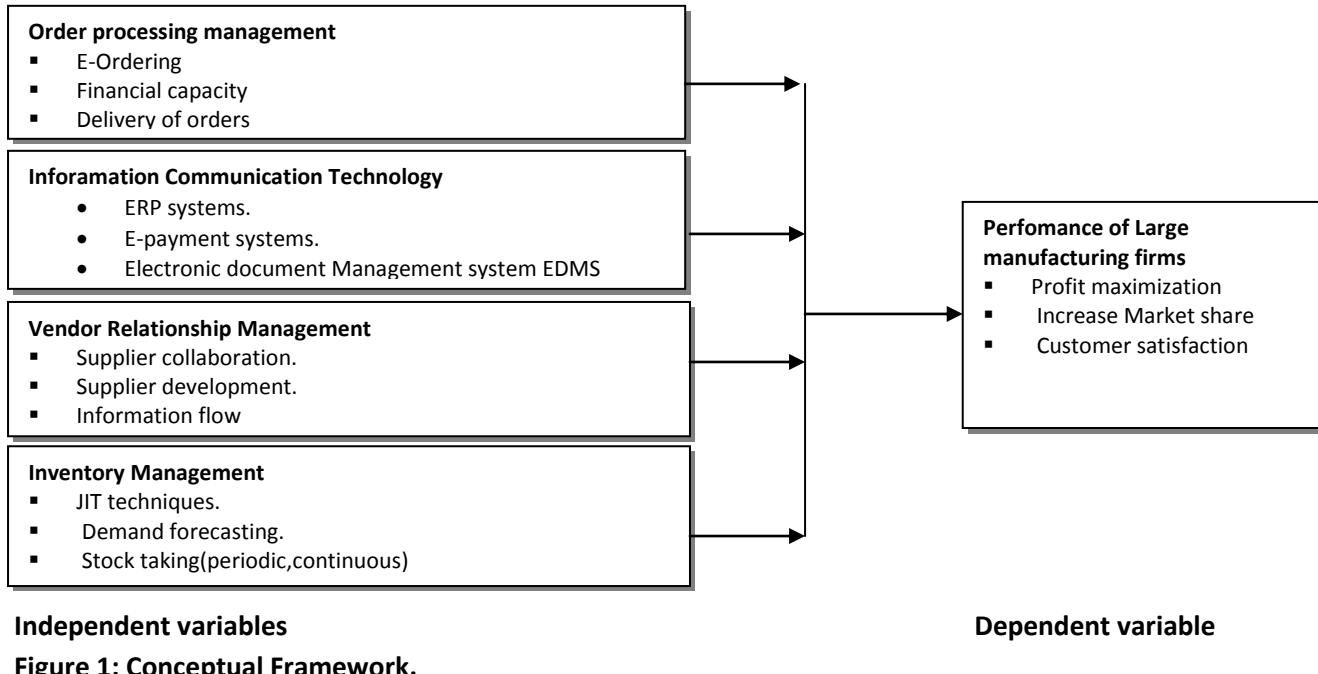
Thai (2010) adapts the systems model to capture "the whole scope of public supply chain". Thai is particularly concerned to portray the core elements of any supply chain system and the relationships between and among them. Thai places the policy-making function with management executives at the top level of a supply chain system. This has the effect of discounting the importance of policy roles that may be played in other elements of his model, for example, his "regulations" element or his "operations" element.

### **Supply-Chain Operations Reference Model**

The SCOR model, developed by the Supply-Chain Council, is a process reference model that serves as a diagnostic tool for supply chain management

(Huan, 2004). According to supply chain council (2004) Supply-Chain Operations Reference (SCOR) provides a standard description of supply chain processes, performance metrics, best practice and enabling technologies. It offers a comprehensive methodology to improve supply chain operations. It is widely acknowledged as the quasi-industry standard for supply chain management (Bauhof, 2004)

According to Kasi and Vijay (2005) SCOR model has proven to benefit companies that use it to identify supply chain problems. The model enables full leverage of capital investment, creation of a supply chain road map, alignment of business functions, and an average of two to six times return on investment. According to Rahangiar *et al* (2012) SCOR frame work help companies to be able to improve its services to Production Departments and in particular to the customer as well as to help companies to understand, evaluate supply chain processes that occur in the Company.



### **Empirical Literature Review**

A study by Onyika (2013) and Eyaa (2015) revealed that the influence of supply chain policies and regulation is being hampered by various challenges which include poor training, lack of awareness and

ethics within the organization there by affecting service delivery. The studies revealed that majority of the tendering committee members have not attended any supply chain training workshops/seminars. The training/capacity building programmers attended by committee members do

not meet the organization needs on the supply chain procedures. The same study indicated that 78% of the respondents considered competitive bidding as the only supply chain method that enables high quality service delivery to both internal customers and external customers.

Obare (2013) study on efficacy of supply chain laws established that there are a number of organizational factors that influence the supply chain policies and its effects on service delivery. These factors include structure and role clarity, preparation of quality and reliable supply chain plans, clear channels of communication, the type of goods and services being procured, the supply chain employees' qualifications and numbers. The research concluded that the level of compliance which is 60% has a direct effect on the level of service offered.

A study by Ingari *et al* (2015) examined two aspects of performance, that is, profitability and customer satisfaction. The study established that 50% of respondent agreed that building buyer-vendor relationships had effect on profits while 100% strongly agreed the same had effect on customer satisfaction. Therefore the conclusion was that in order to enhance service delivery to customers the organization should pay attention in building strong buyer vendor relationship. The study also established that incorporating technology in the supply chain process and strong support from the top management for supply chain process has a great impact of increasing profits and level of customer satisfaction.

A study by Githui (2016) showed that integrity is a main issue for supply chain policies and shows up in the discussions about responsible agents in the supply chain management, who are able to make rational decisions to depict their ethical and moral nature in the conduct. It is therefore relative that to elaborate a list of virtues be set and applied in the management of purchasing and supplies in Kenya. There is also a need to integrate ethical purchasing into existing supply chain management systems incentives and performance reviews can be

structured to reward rather than undermine ethical sourcing. The study concluded that the supply chain policy should be designed in such a way that they safeguard the basic ethical practices in supply chain so as to enhance service delivery.

## METHODOLOGY

This study used descriptive research design which involved gathering of data that described events then organizing, tabulating depicting and describing the data. The study population was manufacturing firms while the target population was large manufacturing firm's in Kenya. A total sample size of 188 respondents was taken. This research used a questionnaire to collect primary data. Descriptive statistics was used to analyze the data

## RESULTS

Out of 188 questionnaires administered, 134 were duly filled and returned making the overall response rate to be 71.3%.

### Information Communication Technology

The research sought to determine from the respondents the extent to which they agreed that firms implemented the information communication technology in an effort to improve performance in the large manufacturing firms. From the research findings, majority of the respondents indicated that they neither agreed nor disagreed that the e-tendering supply chain applied is competitive in nature and enhances the service delivery based on the average mean of 2.85.

Majority of the respondents neither agreed nor disagreed that the E-payments enables customer service delivery which in return results to customer satisfaction as shown by a mean of 2.95; the respondents also had moderate stand that the institution always ensures there is easy accessibility of supply chain information for both as shown by a mean of 2.55. Majority of the respondents were in agreement that the supply chain process is very flexible to facilitate any unforeseen situation such as excess demand of petroleum products in your institution as shown by mean of 3.99.

This implied that majority of the firms had started recognizing the role of information Communication technology on enhancing performance with other firms in the manufacturing sector. The findings of this study were in tandem with literature review by

singer, (2017) who observed that electronic supply chain practices enhance issues such as using effective purchasing strategies, waste reduction, and budget review and planning of the materials.

**Table 1: Descriptive analysis of information communication technology**

Statements	Mean	Std. Deviation
The e-tendering supply chain applied is competitive in nature and enhances the service delivery	2.85	1.54
E-payments enables customer service delivery which in return results to customer satisfaction	2.95	1.43
The institution always ensures there is easy accessibility of supply chain information for both internal customers and external customers	2.55	1.32
The supply chain process is very flexible to facilitate any unforeseen situation in your institution	3.99	1.23
<b>Average</b>	<b>3.08</b>	<b>1.382</b>

### **Order Processing Management**

From the research findings, majority of the respondents indicated that they agreed that the order processing management team includes personnel across the entire organization to facilitate clear understanding of user or customer needs based on the average mean of 3.91. Majority of the respondents agreed that the vendor selection is not always based on lower cost bids but on the value for money as shown by a mean of 4.17. The respondents also had moderate agreement stand that Technical and financial capabilities are

considered while evaluating vendor bids as shown by a mean of 3.33; Majority of the respondents were in agreement that Close buyer - vendor relationship is exercised to ensure customer satisfaction as shown by mean of 3.81. The findings of this study were in tandem with literature review by Tozay, (2012) who observed that order processing management that are enhance issues such as using effective purchasing strategies, and proper ethical standards that enhances performance.

**Table 2: Descriptive analysis of Order Processing Management**

Statements	Mean	Std. Deviation
Vendor evaluation team includes personnel across the entire organization to facilitate clear understanding of user or customer needs.	3.91	1.32
Vendor selection is not always based on lower cost bids but on the value for money.	4.17	1.3
Technical and financial capabilities are considered while evaluating vendor bids.	3.33	1.45
Close buyer - vendor relationship is exercised to ensure customer satisfaction	3.81	1.4
<b>Average</b>	<b>3.805</b>	<b>1.318</b>

### **Vendor relationship management**

The research sought to determine from the respondents the extent to which they agreed that the organization implemented the vendor relationship management to boost their performances. From the research findings in majority of the respondents agreed that the

Organizational development influence performance, as shown by average mean 3.77. Respondents agreed that Information sharing influence performance as shown by average 3.70. The respondents agreed that Inter organizational systems influence performance as shown a mean of 3.78. The respondents agreed that Vendor

relationship competencies influence performance as shown by mean of 4.18. The respondents agreed that Channel relationships influence performance as shown by a mean of 3.64.

This implied that majority of the firms have started recognizing the role of vendor relationship

management in enhancing performance with other firms in the manufacturing sector. The findings of the study were in agreement with literature review by Waithaka (2012), who indicated that supplier relationship management, selection and approach improve productivity and performances of a firm.

**Table 3: Descriptive analysis of vendor relationship management**

<b>Statements</b>	<b>Mean</b>	<b>Std. Deviation</b>
Organizational development influence performance	3.77	0.181
Information sharing influence performance	3.70	0.139
Inter organizational systems influence performance	3.78	0.189
Vendor relationship competencies influence performance	4.18	0.175
Channel relationships influence performance	3.64	0.162
<b>Average</b>	<b>3.57</b>	<b>0.138</b>

#### **Inventory management systems**

The research requested the respondents to indicate the extent to which they agree that firms had implemented the inventory management in an effort to enhance their performances in the manufacturing sector. From the results, majority indicated that they neither agree nor disagree that the organization has put in place a replenishment system that ensure stock are always replenished on time to reduce stock outs as shown by a mean of 3.30. The respondents agreed that There are well trained personnel to manage inventory in the organization as shown by a mean of 3.62.

The respondents agreed that Frequent stock take are undertaken to ensure there is smooth flow of

stock within the organizations departments. as shown by a mean of 4.07. The respondents agreed that Inventory forecasting is very crucial in ensuring smooth flow of operations as shown by a mean of 3.50. The respondents agreed that organization has set up efficient control measures which reduce the stock out and storage costs. as shown by 3.53. The above findings corroborated with literature review by Sandeep (2007) who indicated that supplier development is achievable through; vendor incentives, random assessment of the suppliers ability and keen handling and verification of the products. According to Eya&Oluka (2011), the long term relationship with suppliers is another important aspect of enhancing performance of firms.

**Table 4: Descriptive analysis of inventory management**

<b>Statements</b>	<b>Mean</b>	<b>Std. Deviation</b>
The organization has put in place a replenishment system that ensure stock are always replenished on time to reduce stock outs	3.30	1.28
There are well trained personnel to manage inventory in the organization	3.62	1.27
Frequent stock take are undertaken to ensure there is smooth flow of stock within the organizations departments.	4.07	0.95
Inventory forecasting is very crucial in ensuring smooth flow of operations.	3.50	1.54
The organization has set up efficient control measures which reduce the stock out and storage costs.	3.53	1.45
<b>Average</b>	<b>3.604</b>	<b>1.26</b>

#### **Performance of the firms**

The research requested the respondents to indicate the extent to which they agreed firms implemented

the supply chain practices to enhance their performances in their firms. From the research findings, majority of the respondents neither agreed that; the firms implementation of supply chain practices positively affects to the performance, As such all the variables have effects on the performance of the firm as an important element in its supply chain practices. The firms incorporated supply chain practices also have positive impact on the profit, market share and customer satisfaction as shown in the figure

### **Inferential Analysis**

#### **Correlation Analysis**

The study used Pearson correlation analysis to establish the association among the variables used in the study. Correlation findings indicated that the correlation between Information Communication Technology and performance at manufacturing firm was 0.493 with a corresponding p value of 0.000. The correlation coefficient was therefore significant and positive implying that if information communication technology increases, the performance at manufacturing firm also increases. The findings concurred with KarimiNamusonge (2014) findings who also revealed that ERP systems, E-payment system and E-tendering system affected performance in the manufacturing sector.

The results further revealed that the correlation between order processing management and performance at 0.575 with a corresponding p value

of 0.000. The correlation coefficient was also significant and positive which implied that if there is increase in order processing management, the performance of manufacturing firm also increase. This finding conformed to those of palmer (2013) who found out that there is a strong relationship between approval rating of suppliers and performance of a firm.

The findings also indicate that the correlation between vendor relationship management and performance at manufacturing firm was 0.679 with a corresponding p value of 0.000. The correlation coefficient revealed a significant and positive association implying that if vendor relationship management increase the performance also increases singer (2017) also emphasizes that the scope of vendor relationship management approach is determine whether the operational approach, structural approach and labored approach.

The finding results indicated that the correlation between inventory management systems and performance on manufacturing firms was 0.576 with a corresponding p value of 0.000. The correlation coefficient revealed a significant and positive association implying that increase in inventory management increases the performance. According to Preuss (2011) just in time techniques and demand forecasting methods are very crucial in enhancing the performance of vendors in the organization.

**Table 5: Correlation Matrix**

		Eletronic Supply Chain Practices	Order processing managment	Vendor relationship management	Inventory management systems
Electronic Supply Chain Practices	Pearson correlation	1			
Order Processing Management	Sig Pearson correlation	.538**	1		
Vendor relationship management	Sig Pearson correlation	.535**	.613**	0.000	
Inventory management systems	Sig Pearson correlation	.154**	.373**	.477**	0.001
		0.014	0.000		

Performance	Sig Pearson correlation	.493** 0.000	.575** 0.000	.679** 0.000	.576** 0.000
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### Multivariate Regression Analysis

In order to establish the statistical significance of the hypothesized relationships, multiple linear regression was conducted at 95 percent confidence ( $\alpha=0.05$ ). The result are presented in table 6. The findings revealed a relationship  $R=0.8420$ , indicating

a strong positive association between information communication technology, order processing, vendor relationship management, inventory management systems and performance.  $R^2 = 0.708$  indicate that 70.8% of variation in the performance can be explained by the four variables.

**Table 6: Multivariate Regression Analysis**

Model	R	$R^2$	Adjusted $R^2$	Std. error of the estimate
1	0.8420 <sup>a</sup>	0.708	0.691	0.54908

### Analysis of various (ANOVA) results (overall model significance)

The result of ANOVA test showed that the F value was 22.43 with a significance of p value =0.000 which was less than 0.05, meaning that there is a significant relationship between electronic supply chain practices, order processing management, vendor relationship management, inventory management systems and performance of a firm. The ANOVA statistics at 5% level of significance

showed that the value of F calculates(F computed) was 22.43 and the value of F critical (F tabulated) at 4 degrees of freedom and 83 degrees of freedom at 5% level of significance was 2.44. F calculated (F computed) is greater than the critical (F tabulated ) ( $22.43 > 2.44$ ), this showed that the overall model was statistically significant at 5% significance level.

**Table 7: Analyze of various (ANOVA) results (overall model significance).**

Model		Sum of squares	Df	Mean square	F	Sig
1.	Regression	52.583	4	13.146	22.43	.000 <sup>b</sup>
	Residual	75.674	129	0.586		
	Total	128.257	133			

a) dependent variable: performance

b) Predictors: (constant), information communication technology, Order processing Management, vendor relationship management and inventory management systems.

### Regression coefficient Results

The coefficient of Information Communication Technology was ( $\beta=0.196$ ,  $p=0.000$ ,  $<0.05$ ) showed a statistically significant relationship between electronic supply chain practices and performance. The results implied that a unit increase in information communication technology would result to an increase of 0.196 units in performance. Similarly, Vorster (2013) study concluded that electronic payment systems affected performance of an organization. It was therefore recommended that the implementation of electronic supply chain

practices indicators have impact on the performance of a firm.

The coefficient of order processing management was ( $\beta=0.260$ ,  $p=0.000$ ,  $<0.05$ ) showed a statistically significant relationship between order processing management and performance. The results implied that unit increase in order processing management would result to an increase of 0.260 units in performance. This finding conformed to those of Weele (2010) who found out that there is a strong relationship between order processing

management and performance, therefore the study conclude that the presence of a order processing management positively affects performance in organization.

The coefficient value of vendor relationship management was ( $\beta=0.217$   $p=0.000$ ,  $<0.05$ ) this showed statistically significant relationship between vendor relationship management and performance function of a firm. The results is tandem with the research done by Schmalensee(2013)who found out that just in time is effective in utilization of operational activities in the organization increases the performance of the firms.

The coefficient of inventory management systems was ( $\beta=0.198$ ,  $p=0.000$ ,  $<0.05$ ) showed a statistically significant relationship between inventory management and performance. The results implied that a unit increase in inventory management would results to an increase of 0.198 units in performance of the firm Tozay (2012) also emphasized that the scope of inventory is to determine whether the organization's have just in time as represented by management, is adequate and functioning in a manner which ensures that the suppliers are appropriately identified and managed.

**Table 8: Regression coefficient Results**

	B	Std error	T	Sig.
<b>(constant)</b>	2.331	0.173	13.473	0.000
Information communication technology	0.196	0.042	4.666	0.000
Order Processing Management	0.260	0.065	4.000	0.000
Vendor relationship managmt	0.217	0.052	4.173	0.000
Inventory management systems	0.198	0.061	3.245	0.000

Dependent Variable: performance function

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

$$Y = 2.331 + 0.260X_1 + 0.217X_2 + 0.198X_3 + 0.196X_4 + \epsilon$$

$Y$ = performance

$\beta_0$ = Constant

$X_1$ =E-supply chain practices

$X_2$ = vendor evaluation

$X_3$ = vendor relstship management

$X_4$ = Inventory management

$\epsilon$ = Error term

to performance improvement of the firm's performance

The study found that effectiveness of order processing managment. The extent of technical capabilities of the supplier, Competence level and financial strength are basis for effective and efficient selection of the qualified supplier to perform task and duties of the firms. Therefore, enhancing suitability and competitiveness of the firm.

From the study, vendor relationship management affects the performance of the firm. The supplier collaboration is effective in the performance of the firm. Supplier development is cognizant in enhancing the suitability of the supplier through the critical assessment of the ability to perform. The timely information is moreover very critical in

## CONCLUSIONS

The study found that information communication technology had impact on the performance of the firm, it contributes to the ability to approve the available supplier based on their ability to perform the duties assigned. ERP systems, electronic tendering, and electronic payments also contributes

establishing the ability of the supplier to finish duties on time as speculated by the firm.

The study found that effectiveness of inventory management system contributes to ability to maintain optimum stocks. Dependability of demand forecasting, planning for production requirement and reduced lead times also contributes to optimal stock levels which ultimately improves the performance of the firm. This is because of the ability to forecast the demand of raw materials and the consumables while minimizing the inventories held within the firm.

## **RECOMMENDATIONS**

Manufacturing firms should adopt information communication technology. These should be done by having an effective ERP systems, Electronic payments systems, electronic document management systems, and electronic tendering in the organization. This will aid in improving performance of the organization.

Manufacturing firms should embrace expertise in assessing the technical capabilities of the supplier before the selection. The firms should also focus in ascertaining the financial strength and competence level for the suppliers before placing orders. This will improve the performance of the firms as it was able to meet the requirements of users and also reduce disputes among suppliers

Manufacturing firms should practice long-term relationship with suppliers and develop strategies to develop them so that they can be able to deliver the quality required without errors and defects. Reliable communication practices should be adopted among the suppliers and the buying

organization so as to curb costs from quantity and product deviations. Firms should outsource logistical services from expertise firms so as to minimize damages and delays in materials in transport. These activities improve the performance of the firm as they reduce or prevent costs from deviations in delivery.

Manufacturing firms should adopt the MRP systems, demand forecast techniques and effective stock taking procedure of tracking the inventories and tracing its path. These should be done by having a definite automated inventory control system that will improving the production scheduling, makes flexible manufacturing processes and fast and effective recognition of goods in the stores. This will aid in improving firm's performance as much inventory can be traced easily and the location is identified.

## **Areas for Further Research**

It was recommended that a similar research should be conducted with an aim at investigating the influence of supply chain practices on performance with other variables or of other firms in other sectors, including the service industry in the Kenyan market. The supply chain management practices and performance of manufacturing firms, has not been widely studied which presents gaps in African and Kenyan contexts.. Future research may be designed to compare the findings in this study with findings that relate to firms in other regions in Kenya and other countries.. Concisely, the findings showed that 70.8 % of the performance is explained by the four variables while 29.2 can be accounted by other factors captured by the standard error.

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