International Journal of Business and Social Research

Volume 12, Issue 02, 2022: 01-19
Article Received: 16-01-2022
Accepted: 26-02-2022
Available Online: 07-05-2022
ISSN 2164-2540 (Print), ISSN 2164-2559 (Online)
DOI: https://doi.org/10.18533/ijbsr.v12i02.1429

Influence of supply chain management practices on the performance of oil supplying companies in Nairobi city

Julius Musyoka Kitaka[1], Dr Samuel Muli[2]

ABSTRACT

The purpose of this study was to establish the influence of supply chain management practices on performance of the oil supplying companies in Nairobi City County. The oil supplying industry in Kenya is currently facing challenges ranging from uncontrollable high fuels costs as a result of high cost of importation, transportation and storage of the oil products which has led to low level of customer satisfaction, hence low performance of the oil supplying industries. The study aimed on the oil supplying companies in Nairobi City County as every registered oil supplying companies have their offices at Nairobi. The main objective of the study was to examine the influence of supply chain management practices on performance of the oil supplying companies in Nairobi city county and the specific objectives were; to assess the influence of supply chain collaboration management practice on performance of oil supplying companies in Nairobi city county, to evaluate the influence of customers service management practice on performance of oil supplying companies in Nairobi city county, to examine the influence of demand forecasting management practice on the performance of oil supplying companies in Nairobi city county and to assess the influence of information communication technology management practice on performance of oil supplying companies in Nairobi city county. This study focused on the 84 registered oil companies in Nairobi Kenya as the unit of analysis and the target population. The sampling technique of the study used was stratified random sampling technique in which procurement officers and distribution officers were the unit of observation. This study based the variables on different related theories. The researcher used questionnaires to gather data from respective respondents which were self-administered by the researcher. The study recommended that supply chain partners need to form effective partnership in planning, developing and executing the supply chain management activities, keep on updating with new technology so as to attain a competitive edge by implementing ICT practices on demand forecasting to attain customer satisfaction.

Keywords: Supplier relationship management, Supply chain management practices, Supply chain collaboration, Demand forecasting.

[1] Kenya, Email: juliuskitaka555@gmail.com
[2] Kenya, Email: pgdthesis@gmail.com

1. Introduction

The motivation behind this research paper is that in recent years Supply chain management (SCM) practices have received a great deal of attention by researchers and practitioners. This is because of the uniqueness and the dynamic nature of the supply chain practices involved in oil supply chain management activities these practices include; customer service management, adoption of information and technology, demand forecasting, supplier relationship management, and total quality management. In the background of the study, The oil supplying companies are involved in a global supply chain management that involves transportation of oil products domestically and internationally, inventory management, coordination and control, warehousing of oil products and import and export facilitation of oil products. The industry offers an improved model for planning, implementing and cording supply chain management practices. In a supply chain, oil supplying companies are connected to their upstream suppliers and downstream distributors as oil products, information, and capital flow through the supply-chain (Shima, 2007).

Oil supplying companies use modes of transportation including rail, vessels, road and pipelines. Oil is produced in some regions of the world, as it is demanded around the globe because they represent an essential source of energy and raw material for a of other oil producing companies. Lead-time is usually one week from the shipping point to the final customers' destination (Schwartz, 2000).

The high increase of oil global demand has facilitated oil supplying companies to supply oil and its products through the supply chain systems to access more customers, increase their sales and profits and also increase their market share. The increase in the oil and its products global demand has led to complexity of the oil supplying companies' supply chain management as its still in the development stage of improving the effectiveness and efficiency in their supply chain management. The complexity of petroleum supply chain results from the numerous infrastructures and global sourcing (Easton, 2019).

The uniqueness and importance of the study is that Effective Supply chain Management practices enables a company to reduce the overall costs of supply of goods to customers and improve the customer satisfaction through keeping their promises to their customers by delivering the products at right time at the right place and reduced order cycle time (Shatina, Zulkifli & Norlena, 2014). Supply chain management practices involves strategic approaches used in managing the integration and coordination of supply, demand and the supplier-buyer relationships in order to ensure consumers are satisfied in an efficient, effective and profitable manners (Sople, 2012). Oil supply chain operations involve both upstream activities, including all processes before the raw material is refined; exploration, drilling, extraction, storage, shipping, etc., and downstream activities, which involves the refining, selling and distribution of the product (Luthra, Garg & Haleem, 2013).

The world demand for oil has been growing fast for the last 60 years, and industry analysts indicate that it will continue to grow for coming future. Demand growth for oil in Asia and other developing countries is steadily increasing continuously. National Oil Companies of Kenya (NOCKs) control 77% of worldwide oil reserves as of 2005, partially or fully privatized Russian oil companies control 6% of reserves, Western International Oil Companies (IOCs) now control only 10% of oil reserves and US has 1.7% of proven world oil reserves and 3.3% of world natural gas reserves (Saad, Udin & Hasnan, 2014). The Organization of Petroleum Exporting Countries (OPEC) is an association of 15 countries that attempts to maximize the member countries' profit from oil sales by coordinating the amount of oil that they sell. The OPEC provides a more detailed analysis of oil market developments, including oil supply and demand levels in the world economy. OPEC also aims at bringing stability to the oil market by adjusting oil output to help ensure achievement of match between supply and demand of oil. OPEC nations has a production capacity of about 40 percent of the world's oil production. (Easton, 2019).

The African continent has five of the top 30 oil-producing and supplying countries in the world. It accounted for more than 8.7 million barrels per day in 2018, which is about 9.4% of world output for the year. This level of production is down somewhat from the heights of 2005 to 2010 when African production topped 10 million barrels per day, including a high of nearly 10.7 million barrels per day in 2010. As of 2015, declines have been caused by political and civil instability and violence in many of Africa's biggest oil-producing countries. (Biscardini, 2018).

National Oil Corporation of Kenya (NOCK) was formed and started operating in the year 1984. The NOCK is owned and regulated by the Government of Kenya. National oil corporation ok Kenya participates in the importation, marketing and sale of petroleum products which includes crude oil, white

fuels, lubricants and Liquified Petroleum Gas (LPG). The National Oil Corporation of Kenya is a fully involved in all activities of the petroleum supply chain management including the upstream oil and gas exploration, midstream petroleum infrastructure development and downstream supplying of petroleum products (Saad, Udin & Hasnan, 2014).

2. Statement of the Problem

Kimani (2013) stated that, petroleum is the world's major source of energy in the world. There has been over reliance on the use oil products in the transport sector both globally and locally as the source of power, making oil supplying companies been unable to meet the prevailing customer demand (Matos & Hall, 2017). The oil shortages that have been previously experienced in some areas in Kenya have been attributed to failure of oil supplying companies to effectively match demand and supply, and insufficient transportation of fuel through road (Zhu, Sarkis & Lai, 2017).

The oil supplying industry in Kenya is currently facing challenges ranging from uncontrollable high fuels costs resulting from high cost of importation, transportation, storage of the oil products which has led to low level of customer satisfaction and decline in the profits of oil supplying companies in Kenya. The oil supplying companies are still struggling in delivering the oil products to the final consumer at a lower cost leading to increased prices hence customer dissatisfaction and reduced sales (Anderson, 2018).

Agami and Rasmy (2012) stated that, most of the challenges oil supplying companies in Kenya have been experiencing lie in how they manage their supply chain. Muema (2014) studied on the strategies adopted by oil supplying firms in Kenya to remain competitive and found that cost leadership strategy, focus strategy, and differentiation strategy if well implemented by the oil marketing companies enables them gain a competitive advantage.

Osoro (2015) studied on the factors affecting performance of supply chain systems in the oil products supply industry in Kenya and found that performance of the oil industries is dependent on skilled personnel who can effectively forecast and match demand supply to ensure timeliness delivery of products to the final consumer. Wambui (2016) did a research on the influence of procurement practices on the performance of the of the oil supplying companies and found that ethical procurement, and green supply chain management have been used to a large degree in improving the oil supplying companies performance. In reference to Kimani (2017) Kenya oil supplying companies have tried to formulate some supply chain management practices to manage, coordinate and control the supply of the oil products but still there are cases of oil shortages, high prices leading to low sales hence reduced profits, and high level of capital being held in oil stock thus affecting their cash flow.

Sherman, (2018) argued that, oil supplying companies will continue to have decline in profit margins if they fail to effectively manage their supply chain. The was beefed up by adding study done by (Osoro, 2015; Agami & Rao, 2012), who highlighted existing challenges on which my study was addressing. This gap creates the need to evaluate the influence of supply chain management practices on the performance of the oil supplying companies in Kenya.

3. Objectives of the study

i. To assess the influence of supply chain collaboration management practice on the performance of oil supplying companies in Nairobi City County.
ii. To evaluate the influence of customer service management practice on the performance of oil supplying companies in Nairobi City County.
iii. To examine the influence of demand forecasting management practice on the performance of oil supplying companies in Nairobi City County.

4. Theoretical review

Theoretical framework is a concept that can support a theory of research study. It involves introduction and definition of the theories within a topic and showing how they are related to the subject under study. It involves description and explanation of the theories which explains the existence of the research problem (William, 2016).

4.1 The network theory

Network theory enhances fitness in a central position between companies that are planning to form partnership relations which leads to competitive advantage, effective and efficient information and technology sharing with their partners (Halldórsson, et al., 2008). By taking a network approach, a company can design their supply chains so they can benefit from the advantages of supply chains reliability, and weak ties to facilitate flexibility to manage their responsiveness to change in market demand (Cousins & Spekman, 2003). The network theory is useful for supply chain innovation by facilitating network wide knowledge sharing mechanisms and management (Miles & Snow, 2007).

4.2 Customer satisfaction theory

Customer satisfaction in the supply chain management practices is determined by; timeliness in delivery of the products to the final consumer, level of staff competence in offering good customer service, products availability, availability of the product's brand information to the customers, information accuracy and friendliness, politeness of the staff. When a company satisfy its customers, it enhances customer retention and increases the frequency of the customer re-purchase and increasing sales level thus increase in profits is achieved. In order to achieve customer satisfaction, companies must be able to meet their customers' needs and wants as per their expectations as described in customers' order specification (Peyton, Pitts & Kamery, 2003).

4.3 Theory of demand

The law of supply and demand theory describes the connectivity between the sellers of products and the buyers of those products (Armen, 2006). The theory also defines how the relationship between the availability of a particular goods and services and the demand for those goods and service on their respective prices. The law of supply states that when the prices of goods increase the suppliers become more motivated to supply more quantities of those products in the market and when the prices fall less quantities of the products is supplied to the market, the law of demand also states that the quantity of a good demanded decreases as the price increases, and vice versa. Attainment of equilibrium prices is one of the major objectives of the marketers, which shows that that there is a balance between the quantity supplied of and quantity demanded for goods and services in the market (Armen, 2006).

4.4 Knowledge based view theory

The knowledge-based theory of the firm considers knowledge as the most strategically significant resource of a firm. Knowledge based resources are the major determinants for companies' performance. This knowledge is carried through multiple entities including company's culture and identity, policies, routines, documents, systems, and employees (Devaraj, Krajewski & Wei, 2007). Information communication technologies plays an important role in the knowledge-based view of the company as information communication technologies systems can be used to facilitate extensive intra and intercompany knowledge management (Devaraj, et al., 2007). The oil supplying companies benefit from the use of information communication technologies (ICTs) by enabling them to access the global market.

5. Empirical review

According to Kothari, (2014) the review on similar studies is used along with empirical data collected. The review of empirical literature plays a key role in establishing research gaps upon which the study can be based on. Luthra (2013), observed that most of the supply related performance measurements have an internal focus and do not measure how the company drives profitability. Kimani (2013) stated that, Kenyan oil supplying companies have put in place some supply chain management practices to coordinate and control the supply of the oil but still there are cases of oil shortages, overstocking leading to lost sales and high level of capital being held in oil stock thus affecting their cash flow. Barrow (2013), who observed that the oil industry itself has a benefit on the use of information communication technologies (ICTs) in the global economy. Lin and Sheu (2012) observed that, the oil

and gas industry has continued to face growing stricter and complex government regulation, political risks and competition which has affected price hike and shortages.

Osoro (2015) studied on the factors affecting performance of supply chain systems in the petroleum industry in Kenya and found that performance of the oil industries can give customer satisfaction through having skilled personnel who will effectively perform demand forecasting hence enhance timeliness delivery of products to the final consumer. Ndegwa (2017) studied on the factors influencing supply of petroleum products in Kenya whereby he concentrated on Kenya Pipeline Company found that storage capacity, pipeline infrastructure, government regulations, and quality control have a direct influence on the supply of petroleum products.

Suganthi and Samuel (2012) did a research on the effect of oil price regulation on the financial performance in the oil companies in Kenya and identified that price regulation has more positive effect on the consumers than to the companies. Chima (2007) studied on the supply chain management issues in the oil supplying companies and found that and adoption to the modern technology, supply chain integration, proper management of the decision making, and effective customer segmentation are the major problems in oil supplying companies supply chain management and they are the key facilitators of oil supplying companies performance.

Hussain, Tiravat and Khumawala (2006) studied on the challenges and opportunities in supply chain management in the petroleum industry and found that efficiency and cost effectiveness are the main factors that facilitate continuous supply of oil, lead times minimization, and production and distribution costs reduction. The rigidity in the petroleum supply chain, logistics management, and information technology adoption are main challenges experienced by the oil supplying companies supply chain, the opportunities available for the petroleum supply chain includes; outsourcing for goods and services from a third-party logistics companies, collaboration with supply chain partners through order consolidation and joint decision making. This leads to supply chain cost minimization.

6. Research gaps

It is evident that proper management of the supply chain practices in the petroleum companies is very important because it improves the level of customer satisfaction. Customer satisfaction is a pressing issue in any petroleum industry worldwide. There are existing challenges that hinders the performance of the oil supplying companies in Kenya as evidenced by Osoro (2015) who studied on the factors affecting performance of supply chain systems in the petroleum industry in Kenya.

Lin (2012), who did a research on why firms implement green practices in developing countries. This study was not sufficient because it did not involve all the supply chain management Gist (2013) who conducted a research on the impact of the oil industry on economic growth performance in Nigeria, Barrow (2013) who studied on the impact of information communication technology use on the performance of the oil supplying companies, and Wambui (2014) who researched on the influence of procurement practices on the performance of the oil marketing firms in Kenya. The available studies have not exhaustively discussed on supply chain management practices as reflected by the current performance of oil supply chain including information communication technology, demand forecasting, customer service management and supply chain collaboration which this research is discussing.

7. Data and methodology

7.1 Research design

The study involved the use of a mixed research design. A mixed research design is applicable to large population in a large geographical area coverage and it also facilitates collection of data for the independent and dependent variable (Creswell, 2014).

7.2 Population

For this study the target population was 84 registered oil supplying companies in Kenya with an approximate of 2000 employees (ERC, 2018).

7.3 Sample size

For this study the sample size was obtained using Yamane (1967) formulae at a confidence level of 95%.

$$n = \frac{N}{1 + N(e2)}$$

$$\text{Therefore, } n = \frac{105}{1 + 105(0.052)} = 84$$

Where;
n = Desired sample size
N = Total population
e = Margin error.

7.4 Sampling technique

This study used stratified random sampling technique to determine the specific sample size for each stratum. From the target population, whereby the 84 oil supplying companies were selected.

7.5 Research instruments

For this study, data was collected through questionnaires. A questionnaire is a research instrument that gathers data over a large sample and its objective are to translate the research objectives into specific questions, and answers for each question provide the data for hypothesis testing.

7.6 Data collection procedure

The researcher self- administered the questionnaires to respective respondents in the sample size. 2 questionnaires were issued to each sampled oil supplying companies.

7.7 Data analysis and presentation

Multiple Linear regression was used to test the influence of the independent variables on the change in the dependent variable. The multiple linear regression model used was;

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

Y= performance of the oil supplying companies
$\beta_1, \beta_2, \beta_3, \beta_4 =$ Coefficents of determination

β_0 =Constant

X1 =Supply chain collaboration practice
X2= Customer service management practice
X3 = Demand forecasting practice
X4 = Information communication technology practice
ε = Error term

8. Results and discussion

8.1 Influence of supply chain collaboration practice on the performance of the oil supplying companies

In a five-point Likert scale, the respondents were asked to give their responses on supply chain collaboration management practice. The results are presented in table 8.1 below.

Table 8.1

Influence of supply chain collaboration practice on the performance of the oil supplying companies.

Statement	Mean	Std. Deviation
Our company constantly shares with its supply chain partners on technology change	4.5935	.50954
We usually make joint decisions with our oil supply chain partners	4.6016	.53927
Our company shares transportation resources including trucks with its supply chain partners	4.5691	.55929
Our company practices collaborative communication with the supply chain partners	4.5203	.50163
Our company practices joint knowledge creation with the supply chain partners	4.4228	.57271
We jointly develop KPI's with our oil supply partners	4.2683	.44488
We collaborate with our supply chain partners to solve oil supply chain challenges	4.3740	.51848

N = 123

The analysis of the findings as shown in table 8.1 above, the respondents were in agreement with all the statements in regard to supply chain collaboration with a mean of more than 4.2. It was noted that, joint decision making had the highest level of agreement with a mean of 4.6016 and standard deviation of 0.539. The findings were in agreement with Chima (2007) who found that supply chain integration which includes supply chain collaboration management practice a key facilitator of performance of oil supplying companies. The findings also agree with Barract, (2004) who noted that supply chain collaboration management practice through sharing of information facilitates improvement in knowledge sharing across the supply chain that enables a company to achieve optimized inventory levels which facilitates customer satisfaction. The findings are also supported by Chan, Felix and Anuj (2012) who suggested that supply chain collaboration with supply chain leads to effective information flow which leads to effective management of the customer demand leading to customer satisfaction and improved company's performance.

8.2 Other ways in which your company implement the supply chain collaboration

The respondents were asked to show other practices in which the company does on supply chain collaboration management practice as shown in the table below.

Table 8.2

Other ways in which the respondent's company collaborate in the supply chain management practices.

Supply chain collaboration management practices	Frequency	Percent
Contract coordination	12	32.4
Marketing	11	29.7
Training programs	5	13.5
Planning	4	10.8
Vendor management inventory	5	13.5
Total	37	100.0

Analysis from the table 8.2 above shows that, 32.4% of the respondents said that they collaborate through contract coordination, 29.7% of the respondents said their company collaborate through marketing, 13.5% of the respondents said that their company collaborate in the supply chain management practices in training programs, 10.8% of the respondents said that their compony collaborates in the

supply chain management practices in planning, and 13.5% of the respondents said that their company collaborate in the supply chain management practices through inventory management.

8.3 Influence of customer service management practice on the performance of the oil supplying companies

In a five-point Likert scale, the respondents were asked to give their responses on customer service management practice. The results are presented in table 8.3 below.

Table 8.3

Influence of customer service management on the performance of the oil supplying companies.

Statement	Mean	Std. Deviation
We offer discounts to our customers	4.3740	.50243
Our company trains employees on customer service management	4.4309	.49723
Our company offers after-sale services to our customers	4.3577	.49803
We respond to customer orders within 24hours	4.4390	.51448
We have loyalty programs for our customers	4.3984	.55427
Our company understands our customers' expectations and demand	4.4146	.54211
Our company focuses on managing customer expectations	4.4146	.49467

N = 123

Findings as in table 8.3 above shows that, the respondents were in agreement with all the statements in regard to customer service management practice with a mean of more than 4.3. Notably response to customer orders within 24hours had the highest level of agreement with a mean of 4.4390 and standard deviation of 0.539. The findings of this research are related to that of Osoro (2015) who observed that timeliness delivery of products to the final consumer as an element of a good customer service leads to customer satisfaction. The findings were in agreement with the findings of Suganthi and Samuel (2012) who found that effective customer segmentation enhances customer's needs understanding which leads to improvement of on customer service management practice. The findings also are supported by those of Solomon and Micah, (2010) who observed that company's performance is enhanced by developing a good customer service management practice.

8.4 Other ways your company does to improve on customer service management

The respondents were asked to show other ways in which their company does in practice of customer service management practice as shown in the table 4.11 below.

Table 8.4

Other ways in which respondent's company does to improve on customer service management practice.

Customer service management practices	Frequency	Percent
Managing customer orders	8	18.6
Managing customer relationship	3	7.0
Washing customer vehicles windscreen	28	65.1
Online portals for customers	4	9.3
Total	43	100.0

Analysis from the table 8.4 above, 18.6% of the respondents said that they facilitates customer services through managing customer orders, 7% of the respondents said their company enhances customer service management practice through managing customer relationship, 65.1% of the respondents said that their company enhances customer service management by washing customer vehicles windscreen, and 9.3% of the respondents said that their company enhances customer service management practice through creation of online portals for customers.

8.5 Influence of demand forecasting management practice on the performance of the oil supplying companies

In a five-point Likert scale, the respondents were asked to give their responses on demand forecasting management practice. The results are presented in table 8.5 below.

Table 8.5

Influence of demand forecasting management practice on the performance of the oil supplying companies.

Statement	Mean	Std. Deviation
We have an optimized stock level	4.2520	.56675
Our company trains employees on demand forecasting techniques	4.4634	.51681
Our company undertakes market environment analysis	4.3577	.51423
Our company has an integrated demand forecasting system	4.4634	.54761
Our company undertakes appropriate demand planning	4.5041	.50203
Our company integrates demand data from all the distribution partners	4.4472	.51539
Our company offers corporate training on demand forecasting	4.4553	.54700

N = 123

Findings as in table 8.5 above, the respondents were in agreement with all the statements in regard to demand forecasting management practice with a mean of more than 4.2. it was noted that response to taking appropriate demand planning had the highest level of agreement with a mean of 4.5041 and standard deviation of 0.50203. The findings were in agreement with the findings of Osoro (2015), who found that effective demand forecasting management practice which is enhanced by employing skilled personnel leads to improvement in performance of the oil supplying companies. The findings are supported by Palmatier, George, Crum and Colleen, (2003) who suggested that demand forecasting management facilitates better capacity utilization and allocation of resources which leads to optimization of inventory levels thus minimizing the stock holding cost and enhance customer satisfaction and improve company's performance. The findings were also supported by Ellis and Forman (2006) who suggested that demand forecasting management practice enhances distribution and logistics effectiveness and efficiency and improved customer service levels thus improving the company's performance.

8.6 Other ways your company does to improve on demand forecasting management practice

Respondents were asked to suggest other ways your company does to improve on demand forecasting management practice as shown in the table 8.6 below.

Table 8.6

Other ways in which respondent's company does to improve on the accuracy and effectiveness of demand forecasting management practice.

Demand forecasting management practices	Frequency	Percent
Record keeping	8	24.2
Gross domestic analysis	8	24.2
Just in time technique	17	51.5
Total	33	100.0

Analysis from the table 8.6 above, 24.2% of the respondents said that they improve demand forecasting management practice through record keeping, 24.2% of the respondents said their company enhances demand forecasting management through analyzing GDP, 51.5% of the respondents said that their company enhances demand forecasting management practice by use of Just in Time technique.

8.7 Influence of information communication technology management practice on the performance of the oil supplying companies

In a five-point Likert scale, the respondents were asked to give their responses on information communication technology management practice. The results are presented in table 8.7 below.

Table 8.7
Influence of information communication technology management practice on the performance of the oil supplying companies.

Statement	Mean	Std. Deviation
Our company has E-payment platform	4.5122	.59183
Our company usually sources oil using E-sourcing platform	4.5203	.59160
Our company has an integrated communication infrastructure with other supply chain partners	4.4065	.54076
Our company has an E-procurement platform	4.3740	.50243
Our company operates on E-distribution system	4.5041	.60563
Our company has customer relationship management system	4.3008	.47796
Our company has order tracking system	4.3984	.49157
Our company has an advanced planning and scheduling software	4.2520	.53705

N = 123

Findings as in table 8.7 above, the respondents were in agreement with all the statements in regard to information communication technology management practice on performance of oil supplying companies in Nairobi City County with a mean of more than 4.2. It was noted that response to use of e-sourcing platform had the highest level of agreement with a mean of 4.5203 and standard deviation of 0.59160. The findings were in agreement with the findings of Hussain, Tiravat and Khumawala (2006) who observed that use of information communication technology in the oil supplying companies leads to cost minimization hence improved company's performance. The findings are also supported by Barrow (2013) who observed that oil supplying companies benefits from the use of information communication technology through reduction in the supply chain management cost, increased accuracy and hence increase the company's performance. The findings are also supported by Borgdorff and Schwab (2014) who observed that use of information communication technology reduces the overall oil supply cost thus reducing oil prices, which leads to customer satisfaction as a measure of company's performance.

8.8 Other information communication technology management practices in use

The respondents were asked to show other ways in which the use information communication technology as shown in the table 8.8 below.

Table 8.8
Other information communication technology management practices in use.

ICT management practices	Frequency	Percent
Computerized records keeping	11	22.9
Enterprise resource planning system	16	33.3
Just in time system	8	16.7
E-tendering	8	16.7
E-marketing	5	10.4
Total	48	100.0

Analysis from the table 8.8 above, 22.9% of the respondents said that they apply information communication technology computerizing record keeping, 33.3% of the respondents said use information communication technology in enterprise resource planning, 16.7% of the respondents said that their company use information communication technology through implementation of Just in Time system, 16.7% of the respondents use information communication technology though the use of E-tendering, 10.4% use information communication technology through implementation of E-marketing platform.

8.9 Performance of the oil supplying companies in Nairobi City County

In a five-point Likert scale, the respondents were asked to give their responses on performance of oil supplying companies. The results are presented in table 8.9 below.

Table 8.9
Performance of the oil supplying companies in Nairobi City County.

Statement	Mean	Std. Deviation
Supply chain collaboration leads to timely delivery of the final goods and services to the final consumer	4.3984	.49157
Demand forecasting leads to optimization of the inventory levels	4.5041	.50203
ICT implementation enhances company's profitability	4.5203	.51771
Customer service management improves customer satisfaction	4.6179	.48789
ICT implementation leads to reduction of the supply chain function operations cost	4.5528	.53106
E-sourcing leads to procurement cost reduction	4.4146	.49467
Integrated demand forecasting leads to supply and demand match	4.3171	.50110
Order consolidation leads to minimization of procurement cost	4.3821	.53593
Offering after-sale services to customers leads increased customer repeat purchase	4.4228	.49602

Findings as in table 8.9 above, the respondents were in agreement with all the statements in regard to performance of oil supplying companies in Nairobi city county with a mean of more than 4.3.it was noted that response to customer service management improves customer satisfaction had the highest level of agreement with a mean of 4.6179 and standard deviation of 0.48789. The findings were in agreement with the Sungathu and Samuel (2012) who observed that adoption of modern technology, supply chain integration, proper management of decision making and customer segmentation facilitates improvement on the performance of oil supplying companies in Nairobi City County. The findings are also supported by Muema (2014) who observed that supply chain collaboration management practice, demand forecasting management practice, customer service management practice and information communication technology management practice are supply chain management practices that improves company's supply chain performance.

8.10 Multiple Regression analysis of coefficients of supply chain collaboration, customer service management, demand forecasting management, and information communication technology as the predictors

	Unstandardized coefficients		Standardized coefficients
	B	Std. Error	Beta
(Constant)	2.202	.382	
Supply chain collaboration	.068	.090	.070
Customer service management	.010	.068	.011
Demand forecasting management	.165	.061	.232
Information communication technology	.287	.068	.415

The results presented in table above present the fitness of the regression model in explaining the study phenomena. Supply chain collaboration, customer service management, demand forecasting management and information communication technology were found to be satisfactory variables in influencing the performance of oil supplying companies in Nairobi City County. This is supported by coefficient of determination also known as the adjusted R square of 34.8%. This means that Supply chain collaboration, customer service management, demand forecasting management and information communication technology explain 34.8% of the variations in the dependent variable which is performance of oil supplying companies in Nairobi City County. The results showed that the regression model used to link the relationship of the variables was satisfactory.

Table above provides the results on the analysis of variance (ANOVA). The results indicate that the overall model was statistically significant as supported by a p value of 0.000. This was supported by an F statistic of 17.274 and the reported p value of 0.000 which was less than the conventional probability of 0.05 significance level. The results showed that supply chain collaboration, customer service

management, demand forecasting management and information communication technology are good predictors of companies' performance.

Regression of coefficients results in table above shows that supply chain collaboration has a positive and significant influence on performance of oil supplying companies in Nairobi city county whereby r=0.70, and p=0.450. The table also shows that customer service management has a positive and significant influence on performance of oil supplying companies in Nairobi city county whereby r=0.011, and p=0.888. The table above also shows that demand forecasting management has a positive and significant influence on performance of oil supplying companies in Nairobi city county whereby r=0.232, and p=0.008. Table above also shows that information communication technology has a positive and significant influence on the performance of oil supplying companies in Nairobi city county whereby r = 0.415, and p = 0.000. In conclusion, supply chain collaboration was found to have the highest positive and significant influence on performance of oil supplying companies in Nairobi city county with value of r=0.70, and p=0.450. Therefore, the overall regression results showed that there is a positive and significant relationship between supply chain management practices and performance of the oil supplying companies in Nairobi City County. As such, a proper implementation of supply chain management practices leads to improvement in performance of oil supplying companies in Nairobi City County.

The optimal model was;

$Y = \beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\varepsilon$

Oil supplying companies' performance $=2.202 +0.068X_1 +0.10X_2 +0.165X_3+0.287X_4$

Where; Y= oil supplying companies' performance

B0 = constant

X1 = supply chain collaboration

X2 = customer service management

X3 = demand forecasting management

X4 = information communication technology

8.11 Correlation analysis

The correlation between supply chain management practices and performance of oil supplying companies was analyzed using Pearson product-moment correlation coefficient as shown in the table below.

Table 8.11

Pearson product-moment correlations between supply chain management practices on performance of the oil supplying companies in Nairobi City County.

Variables		Supply chain collaboration	Customer service management	Demand forecasting management	Information communication technology	Supply chain performance
Supply chain collaboration	Pearson Correlation	1	.302**	.397**	.592**	.405**
	Sig. (2-tailed)		.001	.000	.000	.000
	N	123	123	123	123	123
Customer service management	Pearson Correlation	.302**	1	.261**	.359**	.219*
	Sig. (2-tailed)	.001		.004	.000	.015
	N	123	123	123	123	123
Demand forecasting management	Pearson Correlation	.397**	.261**	1	.496**	.463**

	Sig. (2-tailed)	.000	.004		.000	.000
	N	123	123	123	123	123
Information communicati-on technology	Pearson Correlation	.592**	.359**	.496**	1	.568**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	123	123	123	123	123
Supply chain performance	Pearson Correlation	.405**	.219*	.463**	.568**	1
	Sig. (2-tailed)	.000	.015	.000	.000	
	N	123	123	123	123	123

**. Correlation is significant at the 0.01 level (2-tailed).

Analysis of the correlation between supply chain management practices and performance of oil supplying companies in Nairobi city county using Pearson product-moment correlation coefficient as shown in the table above shows that; There was positive correlation between the dependent and the set of independent variables whereby r is greater than 0.2, and p smaller than .001 in all cases. The strength of the relationship between the independent variables and the dependent variable varied from small to large. Supply chain collaboration (r=.405, medium), customer service management (r=.219, small), demand forecasting management (r=.463, Medium) and information communication technology (r=.568, large). Who gave the above parameters??? Citation required. The findings obtained concur with Chima, (2007) who in his study found out that, there was a positive correlation between supply chain collaboration and performance of oil supplying companies. However, the strength of the relationship between supply chain collaboration and performance of oil supplying companies in their study was small (weak) compared to medium (strong) as obtained from this study findings. For customer service management, the findings obtained concur with the findings of Chima, (2007) who found out that, there was a small (weak) relationship between customer service management and performance of oil supplying companies in Nairobi City County. For demand forecasting management, the findings obtained concur with (Osoro, 2015) who found out that proper demand forecasting management had a positive large (strong) correlation with performance of oil supplying companies. For information communication technology, the results obtained concur with (Chima, 2007) who found out that there was strong (strong) relationship between information communication technology and performance of oil supplying companies.

8.12 Level of oil supplying companies' performance

Respondents were asked to show the performance level of their company as show in the table 8.12 below.

Table 8.12

Performance of the oil supplying companies in Nairobi City County.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1% - 25%	56	45.5	45.5	45.5
	26% - 50%	63	51.2	51.2	96.7
	51% - 75%	4	3.3	3.3	100.0
	Total	123	100.0	100.0	

The findings from the table 8.12 above shows that 45.5% of the respondents said that their companies' performance ranges between 1%-25%, 51.2% of the total respondents said that their companies, performance ranges between 26%-50%, 3.3% of the total respondents said that the companies' performance ranges between 51%-75% for the year 2019.

9. Conclusion and policy implications

From the study findings it was clear that supply chain collaboration influences the performance of the oil supplying companies in Nairobi City County. This can be explained by the regression results which showed that the influence was positive and significant. The study concluded that, supply chain collaboration practices in oil supplying companies including information sharing, joint decision making, joint knowledge creation, and resource sharing influence the performance of the oil supplying companies in Nairobi City County. Customer service management influence the performance of the oil supplying companies in Nairobi City County. This can be explained by the regression results which showed that the influence was positive and significant. The study concluded that, customer service management practices including understanding customer needs, managing customer relationship by oil supplying companies offering after sales services, and offering discounts influence the performance of the oil supplying companies in Nairobi City County. Customer satisfaction is achieved through offering a good customer service. From the analysis information communication implementation influence the performance of the oil supplying companies in Nairobi City County. This can be explained by the regression results which showed that the influence was positive and significant. The study concluded that, information communication technology implementation through adoption of e-sourcing, e-procurement, electronic data interchange, and e-payment influence the performance of the oil supplying companies in Nairobi City County. The study's general objective was to examine the influence of supply chain management practices on the performance of the oil supplying companies in Nairobi City County whereby the oil supplying companies involved were only sampled. It would be important to do a research on the influence employee motivation on the performance of the oil supplying companies in Kenya, so that the study can research on how the oil supplying companies motivate their employees and they are usually more close to their customers and they mostly interact with their customers. This will be important because employee motivation determines how the employees treat their customers as they are the key source of profit from the volumes of sales made to the respective customers.

References

Afiqah, M., Musa, H., Suraya, A., & Norhidayah, B. (2014). The risk in Petroleum Supply Chain: A review and typology. *Journal of Technology Management and Technopreneurship,* 2(2), 123-141.

Africa's gas reserves. (2013, June). Source: PwC, "From promise to performance: Africa oil & gas review.

Agami, N., Saleh, M., & Rasmy, M. (2012). Supply Chain Performance Measurement Approaches: Review and Classification, *IBIMA Publishing Journal of Organizational Management Studies 1*(2),1-20.

Aksoy, A., & Öztürk, N. (2011). Supplier selection and performance evaluation in just-in-time production environments, *Journal of supplier management, 38*(5), 6351-6359.

Alchian, A. (2006). *Costs and Outputs. In Choice and Costs under Uncertainty. 1*(2), 161–179.

Anderson, C. (2013). *What is a Quality Management System?* Bizmanualz. Retrieved from http://www.bizmanualz.com/blog/qualitymanagement-system-qms.html.

Armstrong, J., & Scott, N., (2001). *Principles of forecasting*. A handbook for researchers and Practitioners. Norwell, Massachusetts: Kluwer Academic Publishers.

Ayers, J., & James, B. (2006). *Handbook of supply chain management* (2nd ed.). Boca Raton, FL: Auerbach Publication.

Bamford, J., Fubini, D., & David, G. (2004). *Launching a World-Class Joint Venture.* Harvard Business Review. Retrieved 22 September 2017

Barbara, G. & Linda, S. (2007). *Using Multivariate Statistics* (5th ed.). USA: Pearson Education. Inc.

Barratt, M. (2004). *Understanding the meaning of collaboration in the supply chain, Supply Chain Management* 9(1), pp. 30-42. Publisher by Emerald Group Publishing Limited Copyright © 2004, Emerald Group Publishing Limited https://doi.org/10.1108/13598540410517566

Barrow, C. (2013). *The 30 Day MBA* (3rd ed.). London. Kogan Page.

Bartlett, J., Kotrlik, J., & Higgins, C. (2001). Organizational research: Determining appropriate sample size for survey research. *Information Technology, Learning, and Performance Journal, 19* (1), 43–50.

Bernardes, E., & Zsidisin, G. (2008). An examination of strategic supply management benefits and performance implications. *Journal of Purchasing and Supply Management, 14*(4), 209-219.

Billy, G., Erick, C., Yvette, W., RestuSunarto, B., & Harrison, A. (2013). Utilizing Pipeline Quality and Facility Sustainability to Optimize Crude Oil Chains. *The International Journal of Supply Chain Management* 2(1), 20-30.

Blanchard, D. (2010). *Supply Chain Management Best Practices* (2nd ed.). John Wiley & Sons.

Borgdorff, H., & Schwab, M. (2014). *The exposition of artistic research.* publishing art in academia. Leiden University Press.

Bosshard, P. (2012). *How Renewable Energy Solutions Reduce Poverty Around the World.* International Rivers.

Buttle, F., & Maklan, S. (2015). *Customer Relationship Management.* Concepts and Technologies.

C. M. Chima, (2007). Supply-Chain Management Issues in The Oil and Gas Industry. *Journal of Business & Economics Research, 5*(6), 27-36.

Cao, M., & Zhang, Q. (2011). Supply chain collaboration. Impact on collaborative advantage and firm performance. *Journal of Operations Management, 29*(3), 163–180.

Cecere, L., Hofman, D., Martin, R., & Preslan, L. (2005). *The Handbook for Becoming Demand Driven*. AMR Research.

Chalapong, M., & Lazarus, F. (2011). *Multi Echelon Inventory Optimization for an Oil Services Company,* Massachusetts Institute of Technology.

Chan, T., & Prakash, A. (2012). Inventory management in a lateral collaborative manufacturing supply chain a simulation study. *International Journal of Production Research, 50*(16), 4670–4685.

Chang, W., Chiang, M., & Pai, F. (2012). *Cooperative strategy in supply chain networks.* Journal of Industrial Marketing Management, *41*(7), 1114-1124.

Chicksand, D., Watson, G., Walker, H., Radnor, Z., & Johnston, R. (2012). Theoretical perspectives in purchasing and supply chain management: an analysis of the literature. Supply Chain Management: *An International Journal, 17*(4), 454-472.

Choi, Y., & Wu, Z. (2009). Taking the leap from dyads and triads: buyer-supplier relationships in supply networks, *Journal of Purchasing and Supply Management, 15*(4), 26-36.

Chopra, S., & Sodhi, S. (2004). *Managing risk to avoid supply-chain breakdown.* Sloan Management Review.

Christopher C. (2007). supply chain management Issues in the oil and gas Industry. *Journal of Business & Economics Research, 5*(6), 20-40.

Christopher, M. (2005). *Logistics & Supply Chain Management: Creating Value-Adding Networks, 4*(5), 122-200.

Christopher, M., & Jüttner, U. (2000). Developing strategic partnerships in the supply chain: a practitioner perspective. *European Journal of Purchasing & Supply Management, 6*(2), 117-127.

Christopher, M., & Ryals, L. (1999). Supply chain strategy: its impact on shareholder value. *The International Journal of Logistics Management, 10*(1), 1-10.

Clemons, E., & Row, M. (1992). Information technology and industrial cooperation: the changing economics of cooperation and ownership. *Journal of Management Information Systems, 9*(2), 9-28.

Creswell, & John W. (2014). *Research design: qualitative, quantitative, and mixed methods approaches* (4th ed.). Thousand Oaks: SAGE Publications.

Crum, C., & Palmatier, G. (2003). *Demand Management Best Practices.* Boca Raton, Florida. J Ross Publishing.

Dall, M., & Bailine, A. (2004). *Service this: Winning the war against customer disservice* (1st ed.)

DavidMoore, S., & George P. (2005). *Introduction to the practice of statistics* (5th edition). W.H. Freeman & Company.

Day, A. (2012). *6 steps to better SRM. Supply Management. Getting the Most Out of SRM.* Supply Chain Management Review.

Devaraj, S., Krajewski, L., & Wei, C. (2007). Impact of e-Business technologies on operational performance: the role of production information integration in the supply chain. *Journal of Operations Management, 2*(5), 119-1216.

Duclos, K., Vokurka, J., & Lummus, R. (2003). *A conceptual model of supply chain flexibility.* Industrial Management and Data Systems

Easton, A. (2019). *OPEC ministers prepare to raise crude oil output levels at Vienna meeting, Organization of the Petroleum Exporting Countries.* Platts Petrochemical Report.

Ellis, K. (2010). *Production Planning and Inventory Control.* McGraw-Hill.

Energy S. (2018). *Report on the storage tanks in Mombasa, petrol, diesel and kerosene are pushed through the pipeline to various distribution depots stationed at strategic locations across the country.*

Fayezi, S., Zutshi, A., & O'Loughlin, A. (2010). *Collaboration and risk mitigation capability in supply chains: A conceptual framework.* Paper presented at the 24th Australian and New Zealand Academy of Management, Adelaide, Australia.

Fliedner, G. (2003). *CPFR: an emerging supply chain tool. Industrial Management & Data Systems 103*(1), 14-21.

Gadde, L., & Håkansson, H. (2001). *Supply network strategies*. Chichester, UK: Wiley.

Giovanni, D., & Vinzi, E. (2012). Covariance versus component-based estimations of performance in green supply chain management. *International Journal of Production Economics, 135*(2), 907-916.

Gist, D. (2013). *The impact of the oil industry on economic growth performance in Nigeria.* Retrieved from ttp://www.doublegist.com/economic -growth-Nigeria-impact –oil – Industry.

Griethuijsen, R., Eijck, M., Haste, H., Brok, P., Skinner, N., & Mansour, N. (2014). Global patterns in students' views of science and interest in science. *Research in Science Education, 45*(4), 581–603.

Håkansson, H., & Ford, D., (2002). How should companies interact in business networks? *Journal of business research,* 55(2), 133-139.

Håkansson, H., (1987). *Industrial technological development. A network approaches*. London, UK. Croom Helm.

Halldorsson, A., Kotzab, H., Mikkaloa, H., & Skjott-Larsen, T. (2007). Complementary theories to supply chain management, Supply Chain Management. *International Journal, 12*(2), 84-96.

Halldórsson, Á., Larson, D., & Poist, F. (2008). Supply chain management, A comparison of Scandinavian and American perspectives. *International Journal of Physical Distribution & Logistics Management, 38*(2), 126-142.

Hameri, A., & Paatela, A. (2005). Supply network dynamics as a source of new business. *International Journal of Production Economics, 98*(1), 41-55.

Hamilton, S. (2003). *Must chemical companies outsource logistics to save money?* GL&SCS.

Hannum, W. (2016). *Skinner's Theory*. Retrieved January 30, 2016, from http://www.theoryfundamentals.com/skinner.htm.

Happyson, B., Muhammad H., & Elias M. (2017). *Supply Chain Management Practices in the Petroleum Industry of Zimbabwe. International Business Management journal, 1*(1) 2210-2223.

Harland, M., & Knight, A. (2001). Supply network strategy: role and competence requirements. *International Journal of Operations & Production Management, 21*(4), 476-489.

Harland, M., Lamming, R., Zheng, J., & Johnsen, T. (2001). A taxonomy of supply networks, A Global Review of Purchasing and Supply. *The Journal of Supply Chain Management, 37*(4), 21-27.

Hebert, H. (2004). *Oil industry not building new plants.* Arizona Daily Star. Tucson, Arizona.

Heizer, H., & Render, B. (2000). Principles of Operations Management, Prentice Hall.

Helper, S., & MacDuffie, J. (2003). *B2B and Modes of Exchange. Evolutionary and Transformative Effects*. The Global Internet Economy. Wharton Business School.

Hendricks, B., & Singhal, R. (2005). Association between supply chain glitches and operating performance. *A Journal of Management Science, 1*(5), 695-711.

Honcharenko, I. (2015). The Implementation Features of The Strategic Management Process in Organizations of Small and Medium Business. *A Journal of Technology and Design management*, *12*(6), 24-60.

Hopp, J., & Spearman L. (2004). Commissioned Paper to Pull or Not to Pull: What Is the Question? *A Journal of Manufacturing & Service Operations Management*, *30*(5), 111-200.

Hull B, & Bradley Z. (2008). Are supply (driven) chains forgotten? *The International Journal of Logistics Management, 16* (2), 218–236.

Hull, B. (2001). A structure for supply-chain information flows and its application to the Alaskan crude oil supply chain. *A Journal of Logistics Information Management*, *15*(1), 8.

Hyndman, J., & Anne, B. (2006). Another look at measures of forecast accuracy. *International Journal of Forecasting,* 22(4), 679–688.

Ikram, A. (2004). *Supply chain management in the oil and gas sector*. Supply Chain Update, University of Wisconsin-Madison School of Business

Julie, P. (2011). *SPSS Survival Manual, A step by step guide to data analysis using* SPSS for Windows. Australia: Allen & Unwin.

Kimani, W. (2013). Supply Chain Management Challenges in Kenya Petroleum Industry. Case of National Oil Corporation of Kenya. *International Journal Social Sciences and Entrepreneurship*, *1*(3), 231-246.

Klieman, A., & Kairn A. (2012). U.S. Oil Companies, the Nigerian Civil War, and the Origins of Opacity in the Nigerian Oil Industry. *Journal of American History, 1*(1), 155-165.

Knight, R. (2003). *Expanding petroleum production in Africa.* Review of African Political Economy.

Kojima, M., Mathews, W., & Sexsmith, F. (2010). Petroleum markets in Sub-Saharan Africa, Analysis and assessment of 12 countries. *A journal of Extractive Industries and Development Series*, *15*(2), 115-200.

Kothari, C. (2004). *Research Methodology Methods & Techniques.* New Delhi: New Age International (P) Ltd.

Kotler, P., & Keller, L. (2016). *Marketing management*. New Jersey: Pearson Prentice Hall.

Kudo, T. (2015). President, Japan Petroleum Energy Center. *From the speech, Japan's New National Energy Strategy 2015*.

Lamming, R., Johnsen, T., Zheng, J., & Harland, C. (2000). An initial classification of supply networks. *International Journal of Operations & Production Management, 20*(6), 675-691.

Langabeer, I, & Jim, R. (2000). *Aligning Demand Management with Business Strategy.* Supply Chain Management Review.

Lee, H. (2004). *The Triple –A Supply Chain*. Harvard Business Review.

Lee, J., Krajewski, L., Ritzman, P., & Manoj, K. (2007). *"Operations Management: Process Chain and Value Chains* (8th Edition). Pearson Education.

Lin, J., & Sheu, C. (2012). Why do firms adopt/implement green practices? An institutional theory perspective. *A Journal of Procedia-Social and Behavioral Sciences, 5*(7), 533-540.

Lippert, K., & Forman, H. (2006). A supply chain study of technology trust and antecedents to technology internalization consequences. *International Journal of Physical Logistics and Distribution Management, 36*(4), 271-288.

Luthra, S., Garg, D., & Haleem, A., (2013). Identifying and ranking of strategies to implement green supply chain management in Indian manufacturing industry using Analytical Hierarchy Process. *Journal of Industrial Engineering and Management, 6*(4), 9-30.

Macheo, J., & Omiti, J. (2003). Petroleum Market Structure and Pricing Following Deregulation. Occasional. *A Journal of market management, 2*(2), 8-50.

Madhani, M. (2013). *Demand chain management: Enhancing Customer Value Proposition.* The European Business Review.

Martin, R. (2006). *GMA and AMR Research, The Demand Driven Supply Network DDSN*. *A Journal of Business Operating Strategy, 3*(10), 5-15.

Matos, S., & Hall, J. (2018). Integrating Sustainable Development in the Supply Chain: The Case of Life Cycle Assessment in Oil and Gas and Agricultural Biotechnology. *Journal of Operations Management, 25*(6), 1083-1102.

Matusov, E., & Brobst, J. (2013). mechanisms and mitigation strategies for oil and gas pipelines. *A Journal of risk management, 12*(5), 122-280.

Miles, E., & Snow, C. (2007). Organization theory and supply chain management: An evolving research perspective. *Journal of Operations Management, 25*(2), 459-463.

Miles, E., Miles, G., & Snow, C. (2006). *Collaborative Entrepreneurship. A Business Model for Continuous Innovation. Organizational Dynamics*, *35*(1), 1-11.

Muema, H., & Paul, K., (2014). *Strategies Adopted by Oil Marketing Firms in Kenya To Remain Competitive.* University of Nairobi.

Mugenda, M., & Mugenda, G. (2003). *Research Methods: Quantitative and Qualitative Approaches.* Acts Press, Nairobi Kenya.

Mukhopadhyay T, Kekre, F., & Kalathur, N. (1995). *Business value of information technology*: a study of electronic data interchange. MIS Quarterly.

Musau, E. (2012). *Equity research: Kenya oil and gas sector overview*. Nairobi: Standard Investment Bank.

Muus, K., & Baker-Demaray, T. (2007). *Tips on Quantitative Research: Article Development.* New Delhi. Tata McGraw 's Hill.

Ndegwa, W. (2013). *Strategic control systems in strategy implementation and financial performance of Bamburi cement limited, Kenya*. School of Business, University of Nairobi. Unpublished Research

Njau, G. (2010). *The Impact of Value Chain Management Strategy on performance of a company; A case of Major Oil marketing firms in Kenya*. Unpublished MBA, University of Nairobi.

Oliver, R. (1980). *Theoretical Bases of Consumer Satisfaction Research: Review, critique, and future direction. In C. Lamb & P. Dunne (Eds),* Theoretical Developments in Marketing, *101*(2), 206-210.

Olugu, U., & Wong, Y. (2012). An expert fuzzy rule-based system for closed-loop supply chain performance assessment in the automotive industry. Expert Systems with Applications, *39*(1), 375-384.

Omagwa, J., Kihooto, E., & Reardon, G. (2017). Oil Retail Pricing and Price Controls: A Case of Oil Marketing

Osoro, A. (2015). Factors affecting performance of supply chain systems in the Petroleum industries in Kenya. *International Journal of Scientific and Research Publications*, *5*(4), 1-20.

Osuala, S. (2013). The sublimeness of sleaze in the NNPC in the fourth republic, 1999–2007: A historical conspectus. *Journal of Culture, Society and Development*, *1*(2), 52-59.

Palmatier, G., Crum, A., & Colleen, P. (2013). *The Transition from Sales and Operations Planning to Integrated Business Planning.* Indianapolis, Indiana: Dog Ear Publishing,

Petroleum Insight, (2011). *Kenya petroleum sales market shares 2010*. Nairobi: Kenya Petroleum Institute of East Africa.

Raed, H., Tiravat, A., & Basheer, K. (2006). Supply Chain Management in the Petroleum Industry: Challenges and Opportunities, *International Journal of Global Logistics & Supply Chain Management, 1*(2), 90 – 97.

Reginald M., Peyton, S., & Rob, H. (2003). *"Consumer Satisfaction/Dissatisfaction (CS/D): A Review of the Literature Prior to the 1990s",* Allied Academies International Conference, Proceedings of the 119 Academy of Organizational Culture, Communications and Conflict.

Rescher, N., (1998). *Predicting the Future: An Introduction to the Theory of Forecasting.* State University of New York Press.

Saad, Z., Udin, J., & Hasnan, M. (2014). "Dynamic supply chain capabilities: A case study in oil and gas industry," *International Journal of Supply Chain Management, 3*(2), 70-76.

Sabath, E. (2003). *"A new way to maximize contribution", Supply Chain Management Review, 7*(3), 62-98.

Sakhuja, S., & Jain, V. (2012). *Service Supply Chain: An Integrated Conceptual Framework.* CIE42 Proceedings, 5(2), 216-307.

Salama, K., Luzzatto, F., Sianesi, D., Towill, A., & Denis, R. (2009). The value of auditing supply chains. *International journal of production economics*, *11*(2) 34-45.

Samaddar, S., Nargundkar, S., & Daley, M. (2006). Inter-organizational information sharing: The role of supply network configuration and partner goal congruence. *European Journal of Operational Research, 174*(2), 744-765.

Schwartz, B. (2000). *The crude supply chains. Transportation and Distribution* 4(1) 8-30

Shatina S., Zulkifli, U., & Norlena H. (2014). Perspectives in Oil and Gas Supply Chain Management. *International Journal of Business and Economics Research. Special Issue: Supply Chain Management: Its Theory and Applications, 3*(6), 45-50.

Sherman, J. (2018). *Sustainable Development and Change Management. Presented at the SPE International Conference on Health, Safety, and Environment in Oil and Gas Exploration and Production*. Nice, France, *112*(4), 15-17.

Shields, P., & Rangarajan, N. (2013). *A Playbook for Research Methods: Integrating Conceptual Frameworks and Project Management.* New Forums Press.

Sicilia, J., Febles, A., & González, R. (2012). Deterministic Inventory Systems with Power Demand Pattern, *Asia Pacific Journal of Operational Research,* 29(5), 25-28.

Smith, D. (2013). *Demand Driven Performance, Using Smart Metrics.* McGraw Hill

Solomon, M. (2010). *"Seven Keys to Building Customer Loyalty and Company Profits". Fast Company.*

Sople, V. (2012). *Supply Chain Management: Text and Cases.* New Delhi: Dorling Kindersley (India) Pvt. Ltd, Licensees of Pearson education in South Asia.

Soshko, O., & Vjakse, M. (2010). Modelling Inventory Management System at Distribution Company: Case Study, *Scientific Journal of Riga Technical University, 44*(2), 234-300.

Spekman, R. (2003). Strategic supply and the management of inter-and intra-organizational relationships. *Journal of Purchasing and Supply Management, 9*(1), 19-29.

Suganthi L, & Samuel., A. (2012). *Energy models for demand forecasting a review*. Renew Sustain Energy Rev.

Terry, G., & Vavra, R. (1997). *Improving Your Measurement of Customer Satisfaction: A Guide to Creating, Conducting, Analyzing, and Reporting Customer Satisfaction Measurement Programs*. American Society for Qualit.

Togar M., & Ramaswami, S. (2008). Design for supply chain collaboration. *Business Process Management Journal, 14*(3), 401-418.

Uche, C. (2008). Oil, British Interests and the Nigerian Civil War. *The Journal of African History. 49*(1), 111-135.

VanWeele, J. (2005). *Purchasing supply chain management: analysis, strategy, planning and practice, 4*(16), 361-385.

Wambui, M. (2014). procurement practices and performance of the oil marketing firms in kenya. *International Journal of Production Economics, 89*(3), 30-40.

Wang, J., Mo, H., Wang, F. & Jin, F. (2010). Exploring the network structure and nodal centrality of China's air transport network: a complex network approach", *Journal of Transport Geography, 19*(4), 12-21.

Wanjohi, P. (2016). *The Moderating Effect of Adoption of Green Environment on the Relationship between Organizational Characteristics and Performance of Manufacturing Firms in Kenya*. (Doctoral dissertation) retrieved http://ir.jkuat.ac.ke/bitstream/handle/123456789/2348/Peter%20Wanjohi%20%20PhD%.

Wieland, A., & Wallenburg, C. (2011). *Supply-Chain-Management in stürmischen Zeiten (in German)*. Berlin: Universität Verlag der TU.

Wilkinson, I., & Young, L. (2002). On cooperating: firms, relations and networks. *Journal of business research, 55*(2), 123-132.

World Bank (2010). Africa's Infrastructure. Washington DC, www.infrastructureafrica.org/aicd/flagship-report.Gwilliam.

World Bank, (2008a). *Refining Crude Oil – Part 1.* Petroleum Sector Briefing Note No. 10. Phnom Penh: World Bank.

Yee, L., & Platts, W. (2006). A framework and tool for supply network strategy operationalization. *International Journal of Production Economics, 104*(1), 230-248.

Yemisi A., Bolumole, A., Michael K., & Douglas M. (2003). "The Customer Service Management Process," *The International Journal of Logistics Management, 14*(2), 15-31.

Zaheer, A., Gulati, R., & Nohria, N. (2000). *Strategic networks. Strategic management journal, 21*(3), 203.

Zsidisin, A., Ellram, M., & Ogden, A. (2003). "The relationship between purchasing & supply management's perceived value and participation in strategic supplier cost management activities". *Journal of Business Logistics, 24*(2), 29-54