DETERMINANTS OF EFFECTIVE IMPLEMENTATION OF SUPPLY CHAIN MANAGEMENT PRACTICES IN THE DISTRIBUTION OF CONSUMABLE PRODUCTS IN THE OIL INDUSTRY IN KENYA: A CASE OF VANOIL ENERGY LIMITED

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Abstract

Purpose: The study sought to examine the challenges faced in implementing effective supply chain management practices during the distribution of the consumable products in the oil industry in Kenya with reference to Vanoil Energy Limited. The study was to establish how warehousing capabilities, strategic supplier relationships, transportation planning and demand and supply forecasting affect distribution performance of the oil industry. To achieve this, the researcher reviewed both theoretical and empirical literature and proposed the research methodology that addressed the gaps identified in literature as well as answer the stipulated research questions.

Methodology: This research study adopted a descriptive research design approach. The researcher prefers this method because it allows an in-depth study of the subject. A census was conducted where all the 70 staff in procurement department were issued with questionnaires. Data was collected using self-administered questionnaires. The data collected was analysed by use of descriptive and inferential statistics. The quantitative data generated was keyed in and analysed by use of Statistical Package of Social Sciences (SPSS) version 22 to generate information which will be presented using tables, charts, frequencies and percentages. Multiple regression models were used to show the relationship between the dependent variable and the four independent variables in this study.

Results: The findings of the study indicated that warehousing capabilities, strategic supplier relationships, transport planning and demand and supply forecasting have a positive relationship with effective distribution of consumable products in the oil industry.

Recommendations: Finally, the study recommended that companies in the oil industry should embrace supply chain management practices so as to improve distribution performance and further researches should to be carried out in other institutions to find out if the same results can be obtained.

Key Words: *Warehousing Capabilities, Strategic Supplier Relationships, Transportation Planning And Demand, Supply Forecasting and Supply Chain Management Practices*

INTRODUCTION

Supply chains have grown more global and interconnected; as a result they have increased their exposure to shocks and increased the frequency of disruptions. Supply chain speed only exacerbates the problem. Even minor missteps and miscalculations can have major consequences as their impacts spread throughout complex supply chain networks (Woods, 2004). As compliance mandates, suppliers and information flows multiply, supply chains are becoming more complex, costly and vulnerable. Organizations are finding it increasingly difficult to respond to these challenges, especially with conventional supply chain strategies and designs. Oil industry being a multimillion industry, the capital is quite an intensive investment, with a very complex supply chain which has grown more global and interconnected; as a result they have increased their exposure to shocks and increased the frequency of disruptions. Supply chain speed only exacerbates the problem. Even minor missteps and miscalculations can have major consequences as their impacts spread like viruses throughout complex supply chain networks (Togar, Alan & Wright, 2005).

An organisation will always face challenges in responding to challenges, especially with conventional supply chain strategies and designs, since most of the organisation have viewed themselves as entities that exist independently from others and indeed need to compete in order to survive, there is almost tendency to operate exclusive in driving much of corporate strategy, However, such philosophy can be self-defeating if it leads to unwilling to cooperate in order to complete, behind this seemingly paradoxical concept is the idea of supply chain integration and management (Sunil & Meindl, 2004). According to Rajendra (2011) in a study done focusing on the oil industry, the inventory handling systems were not up to date and could not be classified as 70% reliable thus impacting negatively on the distribution to the final consumer. Unreliability in the supply chain management system used by petroleum players was found to be literally expensive and impacted poorly and directly on the company bottom line result and its competitiveness in the long run. In a supply-chain, an organization will link to its suppliers upstream and to its distributors downstream in order to serve its customers. Usually, materials, information, capital, labour, technology, financial assets and other resources flow through the supply-chain. Since the goal of the firm is to maximize profits, the firm must maximize benefits and minimize costs along the supply-chain. The firm must weigh the benefits versus the cost of each decision it makes along its supply-chain (Mathew & Mee, 2008).

Statement of the Problem

Modern supply chains are very complex, with many parallel physical and information flows occurring in order to ensure that products are delivered in the right quantities, to the right place in a cost-effective manner. Consequently, some authors have suggested that supply networks may be a more accurate term than supply chains (Axsater, 2006). It has also been suggested that the drive towards more efficient supply chains during recent years has resulted in the supply chains becoming more vulnerable to disruption and prone to challenges (Angulo, 2004). The Kenyan oil industry has been dodged with a lot of issues affecting distribution performance (KIPPRA, 2010). Inadequate storage facilities, poor risk management for instance volatility in the transportation cost, capacity constraints leading to delay of clearing the products at the deport resulting too long lead times, supplier relationships issues, rise in the prices of oil per barrel, and increased role of traders and speculators are all signs of an inefficient distribution (Mukasa, 2009). The oil industry in Kenya contributes over 20% of the GNP, (KIPPRA, 2010) the transport sector is the largest consumer of petroleum products at approximately 60% of the total volume, followed by manufacturing 16%, commercial establishment 11%, household use 19% and agriculture 4%. The domestic demands for various petroleum fuels on average stands at 2.5 million tons year all of it imported from the gulf region, either as crude oil for processing at the Kenya petroleum refineries limited or as refined petroleum products (KIPPRA, 2010).

Despite the importance of the oil industry in daily life and the operational challenges it experiences, the topic of challenges affecting supply chain management in distribution has received very little attention in operations and supply chain management literature. Although some discussion on challenges affecting supply chain management can be found in literature evidenced by several studies, the basis of most of the literature is in single organizations and in developed countries (Noor, 2011). Applying the knowledge gained from a single company perspective from developed countries to a supply chain management context in less developed countries like Kenya, may be limited. This is because it may not reflect a supply chain management orientation in the oil industry in less developed countries. This study is centered on the challenges facing effective implementation of effective supply chain management practices in the distribution of consumable products in the oil industry in Kenya and it has focused on Vanoil Energy Limited. The study was be taken against the backdrop of the importance of oil industry as a key pillar to the achievement of vision 2030. According to Kenya's Vision 2030 blue print launched in 2008, Kenya's energy sector will be a key enabler for the country's vision. Effective supply chain management in the oil industry in Kenya will therefore have a great positive impact in the achievement of Kenya's vision 2030 (Kimenyi, Mwangi, & Njuguna, 2009).

Research objectives

i.   To establish the effect of warehousing capabilities on effective distribution of consumable oil products in the oil industry in Kenya.

ii. To find out the effect of strategic supplier relationships on effective distribution of consumable products in the oil industry in Kenya.

iii. To assess the effect of transport planning on effective distribution of consumable products in the oil industry in Kenya.

iv.   To determine the effect of demand and supply forecasting on effective distribution of consumable products in the oil industry in Kenya

LITERATURE REVIEW

Theoretical Review

The Logistics Theory

Logistics is defined as the planning, organization, and control of all activities in the material flow, from raw material until final consumption and reverse flows of the manufactured product, with the aim of satisfying the customer's and other interest party's needs and wishes i.e., to provide a good customer service, low cost, low tied-up capital and small environmental consequences (David & Robert, 2004). Logistics in the oil sector is also defined as those activities that relate to receiving the right product or service in the right quantity, in the right quality, in the right place, at the right time, delivering to the right customer, and doing this at the right cost. In most of the cases logistics is seen from the perspective of an operative way of transporting or moving materials from one warehouse to another or producing service. The credibility of this operation is based on how good is the design of the system that leads to this kind of logistics. Logistics systems encompass operative responsibilities, which include administration, operation and purchase and constructive duties as well as detailed design (Cousens, Szwejczewski & Sweeney, 2009).

Logistics management in the oil sector is that part of procurement management that plans, implements, and controls the efficient, effective forward and reverses flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customer's requirements. Logistics management activities in the oil sector typically include inbound and outbound transportation management, fleet management, warehousing, materials handling, order fulfilment, logistics network design, inventory management, supply or demand planning, and management of third party logistics services providers (Chang, 2006). To varying degrees, the logistics function also includes sourcing and procurement, production planning and scheduling, packaging and assembly, and customer service. It is involved in all levels of planning and execution strategic, operational, and tactical. Logistics management is an integrating function which coordinates and optimizes all logistics activities, as well as integrates logistics activities with other functions, including marketing, sales, manufacturing, and information technology in the oil sector (Eskola, 2005).

Partnership Theory

In supply chain, the common model through which theorists study the relationship between supplier and buyer is known as the partnership theory. In its basic nature, the partnership model depicts the buyer and supplier as partners with a common interest which is customer satisfaction (Woods, 2004). Partnership is a business relationship based on mutual trust openness, shared risks and rewards that enables an organisation gain competitive advantage leading in the company achieving a performance that's far much greater than the firm would have achieved when operating as single entities. This model requires efficient information exchange between the buyer and supplier which is a critical element of any partnership (Whan & Teawon, 2005).

The theory further states that any partnership is always based on value and present for each other. The solid and long term relationship simply implies continuous improvement of the organization performance. Suppliers must provide better services that are of high quality than his competition at a price reasonable and still achieve goals to remain in business. Partnership model according to Hughes (2010), increases company efficiency through way of cooperative; both parties obtain cost reduction which leads to price reduction and therefore increasing the market share profit margin as well. This leads to a company gaining a competitive edge and efficiency.

The character which forms the perceived attributes of partnership include the following; high frequency of both formal and informal communication, cooperative attitude, trusting relations are built, problem solving that is win negotiation style, long term business agreement, open sharing of information and there is always vendor certification and defect prevention approach. Motivation factors, environment of operation, strength of operation and duration of operation vary in different partnership formed. However there is never an ideal relationship that is recommended (Haakansson, & Ford, 2002).

There are three types of partnership; which is the most used. Companies recognize each other as partners, all the activities are coordinated, and planned is short term. Only one division within the organization is involved. The second type is partnership which basically integrates activities rather than coordinating as in the case for type 1. There are multiple division and entails a long term horizon. The last type of partnership is the partnership which is not used frequently. Companies share high operational integration and each views the others as an extension of their firm (Gordon, 2004). The partnership theory has three elements which are drivers, facilitators' and used components. The drivers each party must have a driver strong enough to provide them with realistic expectation of significance benefit through strengthening of the relationship. Facilitators on the other have included corporate compatibility, mutuality, managerial philosophy and techniques and symmetry. The final element is the components which are the factors than can be controlled in a partnership by the management. They include planning, joint operating controls, communications, risk/reward sharing, trust and commitment, contract style, scope and financial investment (Ellram & Ogden, 2007). In conclusion in order to gain leadership position against your competitors and ensure the company grows partnership can be used to achieve the above.

The Lean Theory

Lean is a functional model which basically discounts the value of economies of scale and focuses on how to reduce costs as a result of small, incremental and continuous improvement. Lean transportation has certainly become increasingly significant in transport management. Initially organisations involved in manufacturing of products used to involved in manufacturing of products used to involve themselves in lean manufacturing techniques, this has ceased as lean has expanded beyond manufacturing (Fawcett, Gregory & Mathew, 2008). Lean transportation law seeks to explain how organization should manage its transportation system and needs. It states that transportation can be used as a strategic differentiator by the organization and further goes on to say that not all transportation is about waste (Finch, 2004). The theory stated that transportation strategies developed by an organization should support the customer's need and expectations.

Transportation strategies should not be a driver on how much and when a product will be delivered to a customer, rather, the customers' expectations should be understood and transport strategies is designed purposely to meet those expectation. Real savings can only be realized through day to day management and optimization of transport requirements variability. This therefore implies that cost associated with transportation cannot be achieved through inconsistent transportation network designs (Fisher, 2010). This theory is relevant to the study because transportation planning is a key component in effective and efficient distribution in the oil industry.

The Resource Based Theory

Resource based theory is the study of how the exterior resources of an organization affect the performance of the organization. The procurement of exterior resources such as production scheduling software's is a significant tenet of both the strategic and tactical management of any company, an implication in the procurement efficiency of the buying firms especially in tapping into the connection with suppliers as their important and dependable associates through resources such as just in times systems of delivery (Frahm, 2003). Thus this theory props up the concept of supply chain management, resource based theory proposes that actors lacking in crucial resources will seek to create relationships with (i.e., be dependent upon) others in order to acquire required resources such as sales scheduling resources. Just like sellers on buyers for precious markets and buyer will depend on suppliers for external resources. Also, organizations endeavour to alter their reliance relationships by lessening their own reliance or by increasing the dependence of other organizations on them. Within this viewpoint, organizations are viewed as coalitions alerting their structure and patterns of behaviour to acquire and maintain required external resources (Georgiadis, Vlachos & Iakovu, 2005). Acquiring the external resources required by an organization comes by diminishing the organization's reliance on others and/or by increasing other's reliance on it, that is, modifying an organization's influence with other organizations.

This theory of the study resource based view emphasizes the firm's resources as the fundamental determinants of competitive advantage through forecasting the span of life cycle for a product and its management. It adopts two assumptions in analysing sources of competitive advantage (Aitken, 2003). First this model assumes that firms within an industry may be heterogeneous with respect to the bundle of resources that they control. Second, it assumes that resources heterogeneity may persist over time because the resources used to implement firm's strategies are not perfectly mobile across firms. Resource heterogeneity is considered a necessary condition for a resource bundle to contribute to a competitive advantage. The argument goes if all firms in a market have the same stocks of resources; no strategy is available to one firm that would not also be available to all other firms in the market. The resource based view is an efficiency based explanation of performance differences. Aitken (2003) explains that organizational performance is attributed to resources such as demand and supply forecasting techniques having intrinsically different levels of efficiency in the sense that they enable the firms to deliver to their customers at different performance levels. This theory is relevant to the study because one thing depends on another thing to be effective hence for effective distribution performance effective supply chain management practices are put in place in the logistics department.

Conceptual Framework
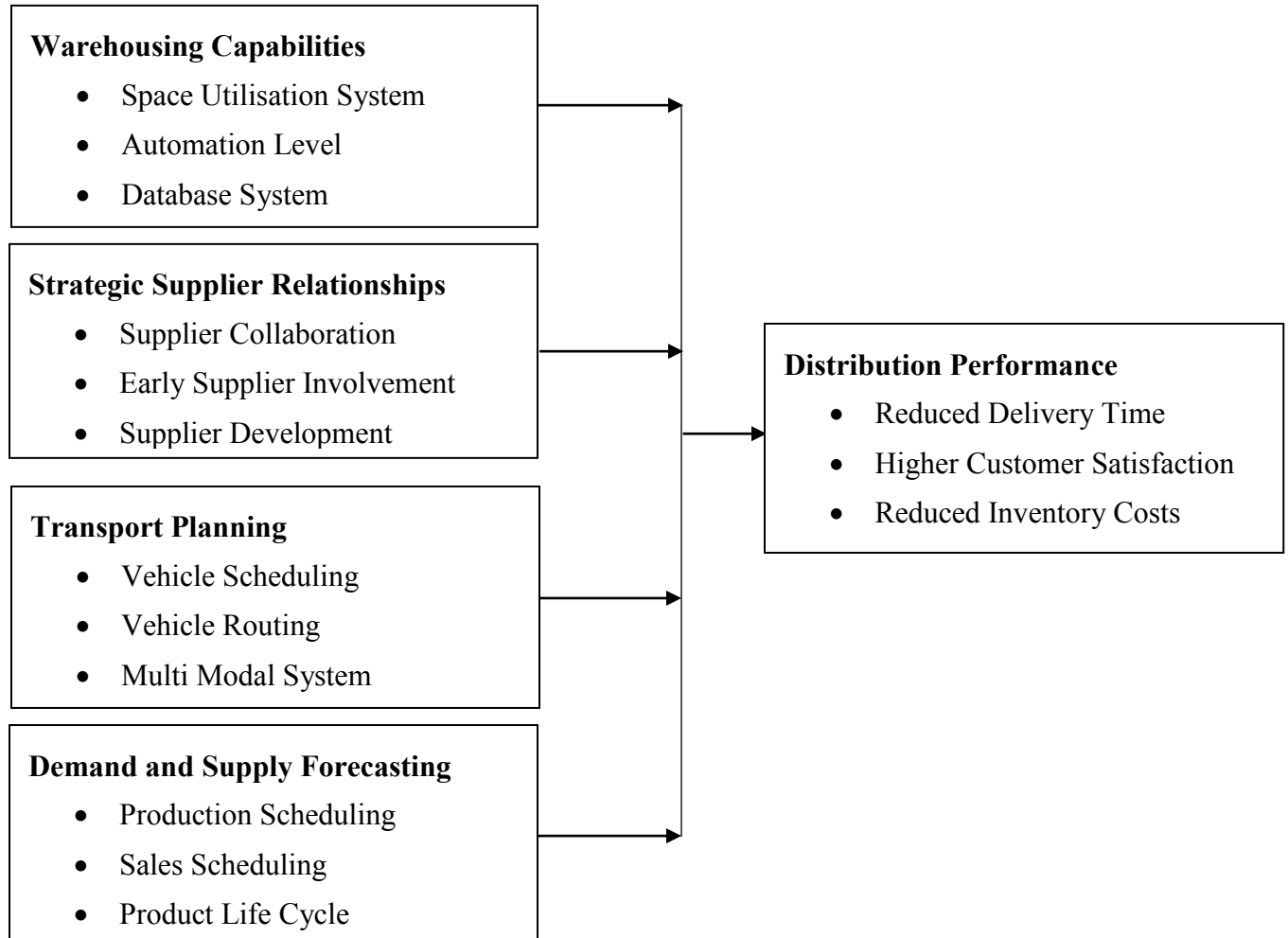
Figure 1: Conceptual framework

RESEARCH METHODOLOGY

The study adopted a descriptive research design. The study's target population constituted the 70 logistics staff of Vanoil Energy Limited and the unit of observation was staff from top management, middle level management and support staff. A census approach was adopted in the study. the study relied on both primary and secondary data. The study used both Pearson correlation coefficient and bi-variate correlation coefficient innestablishing the relations between the study variables. Inferential(regression) and descriptive statistics(mean, standard deviation and percentages) was used to analyze data.

Results of the analysis were presented by use of tables and figures. Inferential statistics was used to establish the association between independent variables and dependent variable. The regression model is as follows;

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

Where; Y= Effective Distribution of Consumable Products in the Oil Industry, β_0 =constant, β_1, β_2, β_3, β_4 = Beta coefficients, X1= Warehousing Capabilities, X2 = Strategic Supplier Relationships, X3 = Transport Planning, X4=Demand and Supply Forecasting and ε= Error Term.

RESULTS

The study administered 70 questionnaires to top and middle level management staff from the ministry of interior and ministry of Water and Irrigation and 63 questionnaires were filled and returned. This represented a response rate of 90%.

Descriptive Statistics and Analysis

Warehouse Capabilities

The first objective of the study was to assess how warehousing capabilities affect effective distribution of consumable products in the oil industry. Results presented in figure 2 indicated that majority of the respondents 33% agreed that it was to a very great extent, 19% said that it was to a great extent, 30% said it was moderate, while little extent was 11% and not all was at 7% respectively.
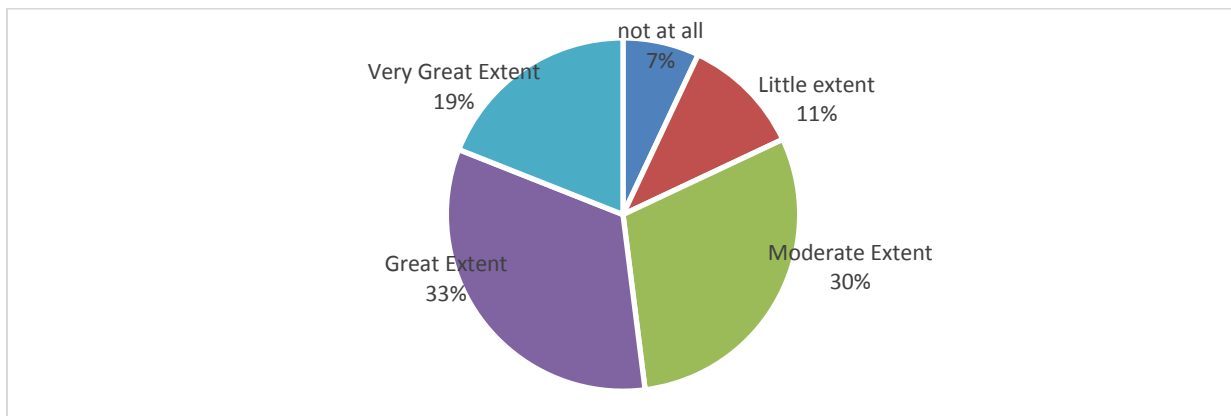

Figure 2: Warehouse Capabilities

The respondents were also asked to comment on statements regarding how warehousing capabilities affect effective distribution of consumable products in the oil industry. The responses were rated on a likert scale and the results presented in table 1 below and was rated on a 5 point Likert scale ranging from; 1 = strongly disagree to 5 = strongly agree. The scores of ' strongly disagree' and 'disagree' have been taken to represent a statement not agreed upon, equivalent to mean score of 0 to 2.5. The score of 'neutral' has been taken to represent a statement agreed upon, equivalent to a mean score of 2.6 to 3.4.

The score of 'agree' and 'strongly agree' have been taken to represent a statement highly agreed upon equivalent to a mean score of 3.5 to 5. Results indicated that majority of the respondents as indicated by a mean of 4.2 agreed on the statement that space utilisation system plays a significant role in reduced delivery time. The variations in the responses were shown by a standard deviation of 1.0. Results indicated that majority of the respondents as indicated by a mean of 3.6 agreed on the statement that automation level plays a significant role in reduced delivery time. The variation in the responses was shown by a standard deviation of 1.3. Results indicated that majority of the respondents as indicated by a mean of 3.6 agreed on the statement that warehouse database system plays a significant role in reduced delivery time. The variations in the responses was shown by a standard deviation of 1.3.

Results indicated that majority of the respondents as indicated by a mean of 3.3 agreed on the statement that space utilisation system plays a significant role in attaining higher customer satisfaction. The variations in the responses were shown by a standard deviation of 1.3. Results indicated that majority of the respondents as indicated by a mean of 4.2 agreed on the statement that automation level plays a significant role in attaining higher customer satisfaction. The variations in the responses were shown by a standard deviation of 0.9. Results indicated that majority of the respondents as indicated by a mean of 3.8 agreed on the statement that warehouse database system plays a significant role in attaining higher customer satisfaction. The variation in the responses was shown by a standard deviation of 0.6. Results indicated that majority of the respondents as indicated by a mean of 4.1 agreed on the statement that space utilisation system plays a significant role in reducing inventory costs. The variations in the responses were shown by a standard deviation of 0.6. Results indicated that majority of the respondents as indicated by a mean of 3.9 agreed on the statement that Automation level plays a significant role in reducing inventory costs. The variation in the responses was shown by a standard deviation of 0.6. These echoed findings by Ballou (2004) that warehousing capabilities is an essential aspect of both distribution management and performance in order for an organization to achieve competitive advantage. Adner and Levinthal (2002) also asserted that implementation of warehouse management system necessarily provides an increase in accuracy, reduction in labour costs and a greater ability to service the customer by reducing cycle times.

Table 1: Warehouse Capabilities

Statements	Mean	Std. Dev
Space utilisation system plays a significant role in reduced delivery time	4.2	1.0
Automation level plays a significant role in reduced delivery time	3.6	1.3
Warehouse database system plays a significant role in reduced delivery time	3.8	1.3
Space utilisation system plays a significant role in attaining higher customer satisfaction	3.3	1.4
Automation level plays a significant role in attaining higher customer satisfaction	4.2	0.9
Warehouse database system plays a significant role in attaining higher customer satisfaction	3.8	0.6
Space utilisation system plays a significant role in reducing inventory costs	3.6	1.3
Automation level plays a significant role in reducing inventory costs	4.1	3.9
Warehouse database system plays a significant role in reducing inventory costs	3.9	1.1
Average	**3.8**	**1.4**

Strategic Supplier Relationships

The second objective of the study was to investigate the effect of strategic supplier relationships on effective distribution of consumable products in the oil industry. Results indicated that majority of the respondents 37% agreed that it was to a very great extent, 33% said that it was to a great extent, 19% said it was moderate, while little extent and not all tied were at 4 and 7% respectively.
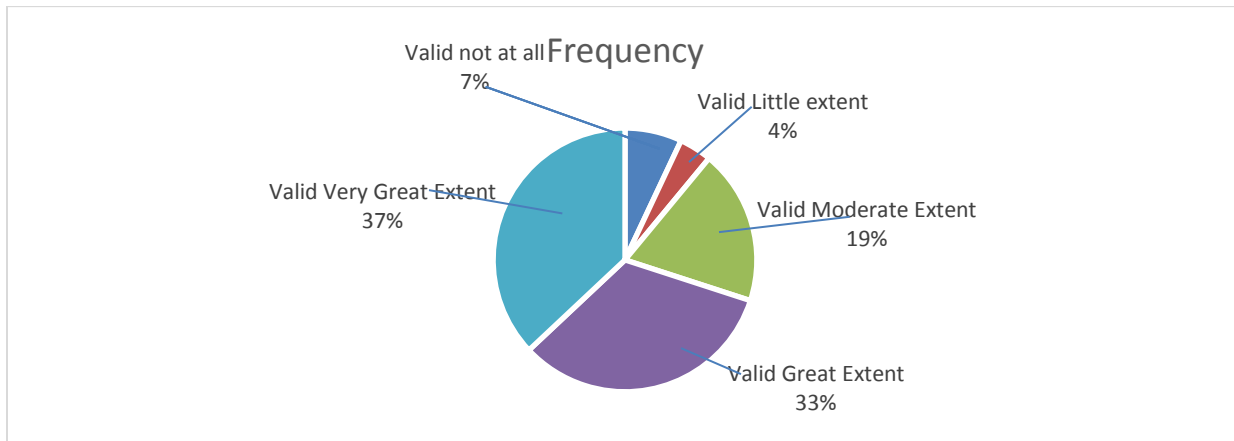
Figure 3: Strategic Supplier Relationships

The respondents were also asked to comment on statements regarding the effect of strategic supplier relationships on effective distribution of consumable products in the oil industry. Results presented in table 2 indicated that majority of the respondents indicated by a mean of 3.8 agreed on statements that supplier collaboration plays a significant role in reduced delivery time. The variation was 1.2. Results indicated that majority of the respondents indicated by a mean of 3.5 agreed on the statement that early supplier development plays a significant role in reduced delivery time. The variation was 1.1. Results indicated that majority of the respondents indicated by a mean of 3.7 agreed on the statement that supplier development plays a significant role in reduced delivery time. The variation was 1. Results indicated that majority of the respondents indicated by a mean of 3.5 agreed on the statement that supplier collaboration a significant role in attaining higher customer satisfaction. The variation was 1. Results indicated that majority of the respondents indicated by a mean of 3.6 agreed on the statement that early supplier development plays a significant role in attaining higher customer satisfaction. The variation was 1.2. Results indicated that majority of the respondents indicated by a mean of 3.5 agreed on the statement that supplier development plays a significant role in attaining higher customer satisfaction. The variation was 1.3

Results indicated that majority of the respondents indicated by a mean of 3.5 agreed on the statement that supplier collaboration plays a significant role in reducing inventory costs. The variation was 1.3. Results indicated that majority of the respondents indicated by a mean of 3.4 agreed on the statement that early supplier development plays a significant role in reducing inventory costs. The variation was 1.4. Results indicated that majority of the respondents indicated by a mean of 3.4 agreed on the statement that supplier development plays a significant role in reducing inventory costs. These echoed findings by Gordon (2004) that supplier-customer relationships has shifted from a focus on the organizational traits associated with relationships to a focus in which personal trust between the parties has been acknowledged as an important ingredient and is a function of individual behaviour and interaction frequency.

Table 2: Strategic Supplier Relationships

Statements	Mean	Std. Deviation
Supplier collaboration plays a significant role in reduced delivery time	3.8	1.2
Early supplier development plays a significant role in reduced delivery time	3.5	1.1
Supplier development plays a significant role in reduced delivery time	3.7	1.0
Supplier collaboration a significant role in attaining higher customer satisfaction	3.5	1.1
Early supplier development plays a significant role in attaining higher customer satisfaction	3.6	1.2
Supplier development plays a significant role in attaining higher customer satisfaction	3.5	1.3
Supplier collaboration plays a significant role in reducing inventory costs	3.5	1.3
Early supplier development plays a significant role in reducing inventory costs	3.4	1.4
Supplier development plays a significant role in reducing inventory costs	3.6	0.5
Average	**3.6**	**1.1**

Transport Planning

There was also need to establish the effect of transport planning on effective distribution of consumable products in the oil industry as the third objective. Results indicated that majority of the respondents 48% agreed that it was to a very great extent, 45% said that it was to a great extent, 2% said it was moderate, little extent was 2% and not all at 3%.
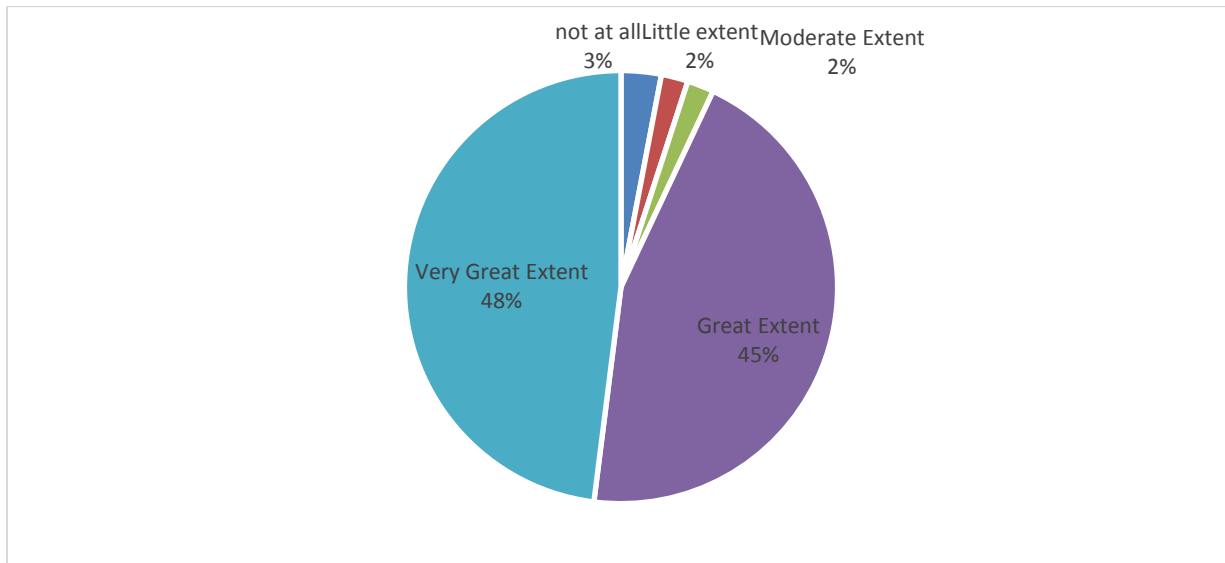
Figure 4.: Transport Planning

The respondents were also asked to comment on statements regarding: effect of transport planning on effective distribution of consumable products in the oil industry. Results presented in table 3 indicated that majority of the respondents as shown by a mean of 4.0 agreed on the statement that vehicle scheduling plays a significant role in reduced delivery time. The standard deviation for the results responses was 1.1. Results indicated that majority of the respondents as shown by a mean of 4.4 agreed on the statement that vehicle routing plays a significant role in reduced delivery time. The standard deviation for the results responses was 1.3. Results indicated that majority of the respondents as shown by a mean of 3.4 agreed on the statement that multi modal system plays a significant role in reduced delivery time. The standard deviation for the results responses was .8.Results indicated that majority of the respondents as shown by a mean of 3.4 agreed on the statement that vehicle scheduling a significant role in attaining higher customer satisfaction. The standard deviation for the results responses was 1.3. Results indicated that majority of the respondents as shown by a mean of 3.7 agreed on the statement vehicle routing plays a significant role in attaining higher customer satisfaction. The standard deviation for the results responses was .7. Results indicated that majority of the respondents as shown by a mean of 2.8 agreed on the statement that multi modal system plays a significant role in attaining higher customer satisfaction. The standard deviation for the results responses was .7.

Results indicated that majority of the respondents as shown by a mean of 3.2 agreed on the statement that vehicle scheduling plays a significant role in reducing inventory costs. The standard deviation for the results responses was 1.2. Results indicated that majority of the respondents as shown by a mean of 3.4 agreed on the statement that vehicle routing plays a significant role in reducing inventory costs. The standard deviation for the results responses was 1.2. Results indicated that majority of the respondents as shown by a mean of 3.6 agreed on the statement that multi modal system plays a significant role in reducing inventory costs. The standard deviation for the results responses was 1.3.

These echoed findings by Ballou (2004) that transport planning is the most important economic activity among the components of business logistics systems and that it plays a connective role among the several steps that result in the conversion of resources into useful goods in the name of the ultimate consumer.

Table 3: Transport Planning

Statements	Mean	Std. Dev
Vehicle scheduling plays a significant role in reduced delivery time	4.0	1.1
Vehicle routing plays a significant role in reduced delivery time	3.4	1.3
Multi modal system plays a significant role in reduced delivery time	4.1	0.8
Vehicle scheduling a significant role in attaining higher customer satisfaction	4.1	1.0
Vehicle routing plays a significant role in attaining higher customer satisfaction	3.7	0.7
Multi modal system plays a significant role in attaining higher customer satisfaction	2.8	1.3
Vehicle scheduling plays a significant role in reducing inventory costs	3.2	1.2
Vehicle routing plays a significant role in reducing inventory costs	3.4	1.2
Multi modal system plays a significant role in reducing inventory costs	3.6	1.3
Average	**3.6**	**1.1**

Demand and Supply Forecasting

There was also need to establish the effect of demand and supply forecasting on effective distribution of consumable products in the oil industry. Results in Figure 5 indicated that majority of the respondents 37% agreed that it was to a very great extent, 33% said that it was to a great extent, 19% said it was moderate, while little extent and not all tied were at 4 and 7% respectively.
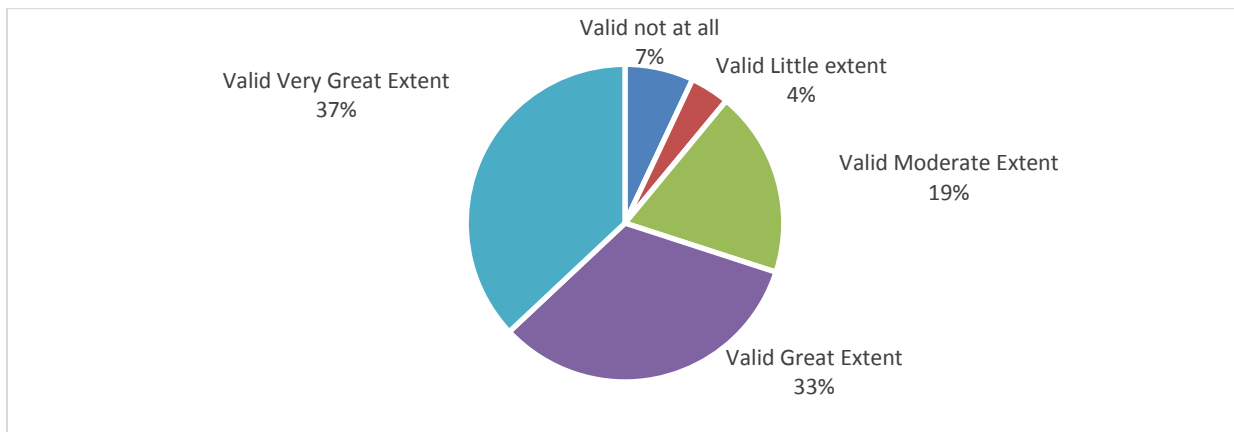
Figure 5: Demand and Supply Forecasting

Descriptive results presented in table 4 indicated that majority of the respondents agreed on the statement that production scheduling plays a significant role in reduced delivery time. The mean for this statement was 2.8 while the standard deviation the variation in the responses was 1.4. Results indicated that majority of the respondents agreed on the statement that sales scheduling play a significant role in reduced delivery time. The mean for this statement was 3.3 while the standard deviation the variation in the responses was 1.4. Results indicated that majority of the respondents agreed on the statement that Product life cycle plays a significant role in reduced delivery time. The mean for this statement was 3.3 while the standard deviation the variation in the responses was 1.1. Results indicated that majority of the respondents agreed on the statement that production scheduling plays a significant role in attaining higher customer satisfaction. The mean for this statement was 4.2 while the standard deviation the variation in the responses was .9. Results indicated that majority of the respondents agreed on the statement that sales scheduling plays a significant role in attaining higher customer satisfaction. The mean for this statement was 4.1 while the standard deviation the variation in the responses was 1.2. Results indicated that majority of the respondents agreed on the statement that Product life cycle plays a significant role in attaining higher customer satisfaction. The mean for this statement was 4.3 while the standard deviation the variation in the responses was .7.

Results indicated that majority of the respondents agreed on the statement that production scheduling plays a significant role in reducing inventory costs. The mean for this statement was 4.4 while the standard deviation of the variation in the responses was .8. Results indicated that majority of the respondents agreed on the statement that sales scheduling plays a significant role in reducing inventory costs. The mean for this statement was 4.4 while the standard deviation the variation in the responses was .6. Results indicated that majority of the respondents agreed on the statement that product life cycle plays a significant role in reducing inventory costs. The mean for this statement was 4 while the standard deviation the variation in the responses was .6. These echoed findings by Chang (2006) that demand and supply management is focused on a fast and adequate integration of supplier needs in order to balance and strategically align demand with operational capability in the supply chain.

Table 4: Demand and Supply Forecasting

Statements	Mean	Std. Dev
Production scheduling plays a significant role in reduced delivery time	2.8	1.4
Sales scheduling play a significant role in reduced delivery time	3.3	1.1
Product life cycle plays a significant role in reduced delivery time	4.2	0.9
Production scheduling plays a significant role in attaining higher customer satisfaction	4.1	1.2
Sales scheduling plays a significant role in attaining higher customer satisfaction	4.2	0.9
Product life cycle plays a significant role in attaining higher customer satisfaction	4.3	0.7
Production scheduling plays a significant role in reducing inventory costs	4.4	0.6
Sales scheduling plays a significant role in reducing inventory costs	4.4	0.8
Product life cycle plays a significant role in reducing inventory costs	4.4	0.6
Average	**4.0**	**0.9**

Correlation Analysis

The correlation summary shown in Table 5 indicates that the associations between each of the independent variables and the dependent variable were all significant at the 95% confidence level. The correlation analysis to determine the challenges facing implementation of effective supply chain management practices in the distribution of consumable products in the oil industry in Kenya, Pearson Correlation Coefficient computed and tested at 5% significance level. The results indicate that there is a positive relationship (r=0.479) between warehousing capabilities and effective distribution of consumable oil products in the oil industry in Kenya. In addition, the researcher found the relationship to be statistically significant at 5% level (p=0.000, <0.05). The correlation analysis to determine the relationship between warehousing capabilities and effective distribution of consumable oil products in the oil industry in Kenya, Pearson Correlation Coefficient computed and tested at 5% significance level.

The results indicate that there is a positive relationship (r=0.323) between strategic supplier relationships and effective distribution of consumable oil products in the oil industry. In addition, the researcher found the relationship to be statistically significant at 5% level (p=0.000, <0.05).

The correlation analysis to determine the relationship between transport planning and effective distribution of consumable oil products in the oil industry, Pearson Correlation Coefficient computed and tested at 5% significance level. The results indicate that there is a positive relationship (r=0.628) transport planning and effective distribution of consumable oil products in the oil industry. In addition, the researcher found the relationship to be statistically significant at 5% level (p=0.000, <0.05). The correlation analysis to determine the relationship between demand and supply forecasting and effective distribution of consumable oil products in the oil industry, Pearson Correlation Coefficient computed and tested at 5% significance level. The results indicate that there is a positive relationship (r= 0.676) between demand and supply forecasting and effective distribution of consumable oil products in the oil industry. In addition, the researcher found the relationship to be statistically significant at 5% level (p=0.000, <0.05). Hence, it is evident that all the independent variables could explain the changes in the effective distribution of consumable oil products in the oil industry on the basis of the correlation analysis.

Table 5: Summary of Correlations

		Warehousing Capabilities	Strategic Supplier Relationships	Transport Planning	Demand and Supply Forecasting	Effective Distribution of Consumable Products
Warehousing Capabilities	Pearson Correlation	1				
Strategic Supplier Relationships	Pearson Correlation	. 289**				
	Sig. (2-tailed)	0				
Transport Planning	Pearson Correlation	.368**	.344**	1		
	Sig. (2-tailed)	0	0			
Demand and Supply Forecasting	Pearson Correlation	.352**	.457**	.520**	1	
	Sig. (2-tailed)	0	0	0		
Effective Distribution of Consumable Products in the Oil Industry	Pearson Correlation	.479**	.323**	.628**	.676**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	

** Correlation is significant at the 0.05 level (2-tailed).

Regression Analysis

Table 6 presents the regression coefficient of independent variables against dependent variable. The results of regression analysis revealed there is a significant positive relationship between dependent variable (effective distribution of consumable products in the oil industry) and the independent variables (warehousing capabilities, strategic supplier relationships, transport planning and demand and supply forecasting). The independent variables reported R value of .775 indicating that there is perfect relationship between dependent variable and independent variables. R square value of 0.6 means that 60% of the corresponding variation in effective distribution of consumable products in the oil industry can be explained or predicted by warehousing capabilities, strategic supplier relationships, transport planning and demand and supply forecasting, which indicated that the model fitted the study data. Adjusted R square in table 6 is called the coefficient of determination which indicates how effective distribution of consumable products in the oil industry varied with variation in effects of factors which includes warehousing capabilities, strategic supplier relationships, transport planning and demand and supply forecasting. The results of regression analysis revealed that there was a significant positive relationship between dependent variable and independent variable at (β = 0.309), p=0.002 <0.05).

Table 6: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.775[a]	.60	.586	.16769

Predictors: (Constant), Warehousing Capabilities, Strategic Supplier Relationships, Transport Planning and Demand and Supply Forecasting

Dependent Variable: Effective Distribution of Consumable Products in the Oil Industry

The significance value from results of ANOVA is 0.000 which is less that 0.05 thus the model is statistically significance in predicting how warehousing capabilities, strategic supplier relationships, transport planning and demand and supply forecasting influence effective distribution of consumable products in the oil industry. The F critical at 5% level of significance was 16.50. Since F calculated which can be noted from the ANOVA results in table 7 is 21.8545 which is greater than the F critical (value = 16.50), this shows that the overall model was significant. The study therefore establishes that; warehousing capabilities, strategic supplier relationships, transport planning and demand and supply forecasting were all important factors influencing effective distribution of consumable products in the oil industry. These results agree with Asaari and Razak (2010) results which indicated a positive and significant influence of effective supply chain management practices on the effective distribution of consumable products in the oil industry in Kenya.

Table 7: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.809	4	1.202	21.8545	.000[b]
	Residual	3.206	58	0.055		
	Total	8.014	62			

Predictors: (Constant), Warehousing Capabilities, Strategic Supplier Relationships, Transport Planning and Demand and Supply Forecasting

Dependent Variable: Effective Distribution of Consumable Products in the Oil Industry

The correltion findings presented in table 8 also shows that taking all other independent variables at zero, a unit increase in transport planning will lead to a 0.146 increase in effective distribution of consumable products in the oil industry. The P-value was 0.00 which is less than 0.05 and thus the relationship was significant. The study also found that a unit increase in strategic supplier relationships will lead to a 0.03 increase in effective distribution of consumable products in the oil industry. The P-value was 0.03 and thus the relationship was significant. In addition, the study found that a unit increase in warehousing capabilities will lead to a 0.11 increase in the effective distribution of consumable products in the oil industry. The P-value was 0.00 and thus the relationship was significant. Lastly, the study found that a unit increase in demand and supply forecasting will lead to a 0.215 increase in the effective distribution of consumable products in the oil industry. The P-value was 0.00 and hence the relationship was significant since the p-value was lower than 0.05. The findings of the study show that, demand and supply forecasting contributed most to the effective distribution of consumable products in the oil industry in Kenya.

Table 8: Coefficients of Determination

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.44	0.198		12.323	0.000
	Demand and Supply Forecasting	0.215	0.035	0.455	6.142	0.000
	Transport Planning	0.146	0.045	0.214	3.244	0.000
	Warehousing Capabilities	0.11	0.024	0.334	4.583	0.020
	Strategic Supplier Relationships	0.03	0.033	0.062	0.9090	0.030

Predictors: (Constant), Warehousing Capabilities, Strategic Supplier Relationships, Transport Planning and Demand and Supply Forecasting

Dependent Variable: Effective Distribution of Consumable Products in the Oil Industry

Effective Distribution of Consumable Products in the Oil Industry= 2.44 + 0.215(Warehousing Capabilities) + 0.146(Strategic Supplier Relationships) + 0.11(Transport Planning) + 0.03(Demand and Supply Forecasting)

The regression equation above has established that taking all factors into account (warehousing capabilities, strategic supplier relationships, transport planning and demand and supply forecasting) constant at zero, effective distribution of consumable products in the oil industry will be an index of 2.44.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

On warehouse capabilities, all the likert scale items had a tendency toward positive responses and this leads the study to conclude that warehouse capabilities is significant and has a positive relationship with distribution performance. On strategic supplier relationships, the study concludes that supplier relationships currently in place at Vanoil Energy Limited were very effective in the distribution of consumable oil products. The study also concludes that supplier-customer relationships has shifted from a focus on the organizational traits associated with relationships to a focus in which personal trust between the parties has been acknowledged as an important ingredient and is a function of individual behaviour and interaction frequency. On transport planning, the study concludes that the transport planning currently in place at Vanoil Energy Limited was very effective in the distribution of consumable oil products. The study also concludes that transport planning is the most important economic activity among the components of business logistics systems and that it plays a connective role among the several steps that result in the conversion of resources into useful goods in the name of the ultimate consumer. This is because all items had a tendency toward positive responses and this leads to the conclusion that there exists a positive relationship between transport planning and distribution performance of consumable oil products.On demand and supply forecasting, the study concludes that the demand and supply forecasting currently in place at Vanoil Energy Limited was very effective in the distribution of consumable oil products. The study also concludes that demand and supply management is focused on a fast and adequate integration of supplier needs in order to balance and strategically align demand with operational capability in the supply chain.

Recommendations

The study recommends that with a supply chain organized around a central warehouse, the main benefit to expect is a reduction of costs where a central warehouse implies less stocking facilities with a better use of the surface and reducing the number of employees. The study also recommends utilization of computer systems that is beneficial since it makes tracking easier and mistakes are avoided. This is because warehouse management affects employee productivity, overall efficiency, and even storage capacity.

Automated systems ensure a consistent and coherent management of the process of storage and movement of materials within a warehouse. It makes detecting and control of stock possible, since employees always have real-time information after every performed activity like transportation, picking or put away. The database should then be collected to provide accurate information about product status thus bringing more control over the facility and mistakes are avoided.The study also recommends that apart from sharing of information with suppliers, firms should go further and give incentives to suppliers who share information in time hence reduce quality problems and also reduce delivery time. This will enable organizations mitigate any unforeseen events that may affect delivery of supplies especially during emergencies. This can be achieved through improvement of supplier collaboration, early supplier involvement and supplier development. Organizations should also ensure the use of IT in all aspects of supplier relationship if they have to realize an optimal supply chain performance, in this case distribution performance.

On transport planning, the study recommends that supply chain managers should put emphasis on transport planning since it is the most important economic activity among the components of business logistics systems and it plays a connective role among the several steps that result in the conversion of resources into useful goods in the name of the ultimate consumer. The study also recommends that for effective distribution of consumable oil products, transport planning by the oil industry, as measured by vehicle scheduling, vehicle routing and multi modal system should play a connective role among the several steps that result in the conversion of resources into useful goods in the name of the ultimate consumer. This is because the planning of these functions and sub-functions into a system of goods movement in order to minimize cost maximize service to the customers that constitutes the concept of business logistics by effective. On demand and supply forecasting, supply chain managers should carefully address demand and supply by focusing on a fast and adequate integration of supplier needs in order to balance and strategically align demand with operational capability in the supply chain. The success of a supply chain is often linked to its efficiency, which can be traced back to the ability of managers to conduct accurate forecasting when it comes to revenue and inventory that are tied to a crucial process in the world of supply chain demand planning. The study recommends using analytics that examine historical sales data, customer orders, shipments, current sales and market indicators to better predict demand patterns based on market changes, enabling firms to make smart decisions about inventory and production levels. The study also recommends that since good demand planning is highly accurate, based on data and enhances profitability, oil firms should get each player in the supply chain on board and examining the correct data and running the information through a number of filters.

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