THE RELATIONSHIP BETWEEN BENCHMARKING AND SUPPLY CHAIN PERFORMANCE: A CASE OF TOTAL KENYA LIMITED.

BY

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DECLARATION

This project is my original work and has not been presented for a degree in any other university or institution of higher learning.

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This research project has been submitted for examination with my approval as the university supervisor.

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DEDICATION

This study is dedicated to my son Adrian, daughter Ariana and to my beloved wife Janet.

ABSTRACT

The main purpose of this study was to examine the relationship between benchmarking and supply chain performance at Total Kenya limited. The other objectives were to establish the challenges of performance benchmarking, level of performance benchmarking and the benefits of performance measurement and benchmarking. The study adopted a case study of Total Kenya limited and the respondents were drawn from the supply chain departments of planning and supply, operations and customer service. The study established that the company highly benchmarked its supply chain performance measures in all the main areas of the supply chain. The top most benchmarked measures in order are compliance to safety requirements, supplier performance towards environment and safety, on time delivery with no damage, order fulfillment cycle time and maximum allowable defects. Price and cost measures were the least benchmarked in the company. The study established a significantly high positive relationship between benchmarking and supply chain performance. All the measures studied indicated positive correlation of benchmarking with supply chain performance .Challenges were however identified which could hinder the success of this benchmarking and supply chain performance measurement, biggest was lack of management support.

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LIST OF ABBREVIATIONS AND ACCRONYMS

SCOR-Supply chain operations reference model

SCC-Supply chain council

SCMC-Supply chain management cost

ERC-Energy regulatory Commission

LPG- liquefied Petroleum gas

TKL-Total Kenya Limited

KPC-Kenya Pipeline Company

NOCK-National oil cooperation of Kenya

ERP-Energy resource planning

CHAPTER ONE: INTRODUCTION

1.1 Background

The demands of an increasingly competitive global economy have drawn attention to the supply chain and how to manage it better. Driven by customer demand for efficient expedited service and need to reduce inventory costs the concept of managing the entire supply chain from raw materials to delivery of finished product is revolutionalizing the way companies are doing business (Amyzuckaman, 2002). Senior management is challenged more than ever by issues of quality, costs, competitiveness, rapid change, old culture, and new technology and in some cases need to re-invent the organization (Hall, 1996). The operating environment for the oil sector in Kenya is very challenging due to increased customer awareness, competition, technological changes, liberalization, global competition, and population growth, environmental and regulatory issues.

Supply chain is a sequence of organizations, their facilities, functions and activities that are involved in producing and delivering a product or service .The sequence begins with basic suppliers of raw materials and extends all the way to the final customer. Facilities include warehouses, factories, processing centers; distribution centers, retail outlets and offices. Functions and activities include forecasting, purchasing, inventory management, information management, quality assurance, scheduling, production, distribution, delivery and customer satisfaction (Stevenson, 2001). Modern supply chain performance measurement contains variety of measures. Most supply chain performance measures fall under price performance ,cost effectiveness, revenue, quality, time and delivery responsiveness, technology, innovation, physical environment and safety, asset and

integrated supply chain management , administration and efficiency, internal customer satisfaction, supplier performance and strategic performance (Handfield et al., 2009).

The supply chain management function has to examine ways to promote customer containment, balance growing customer demand for timely and efficient service and take into account rapid changes in technology for performance improvement. Several techniques are used for performance improvement. A study by Wagwa (2005) revealed that although at the time of inception each technique looks the best, the reality is that none of them actually meets the company's performance improvement needs. An overwhelming number of the firms surveyed in the study (94%) cited benchmarking as the tool that helped them realize performance improvement when used with other techniques. Benchmarking has been rated very favorably by the manufacturing industries (smith 1997, Hall 1997).

Benchmarking recognizes that ideas are available everywhere, the challenge is seeking them and applying them. Superior performance or dantotsu in Japanese meaning striving to be the best of the best captures the essence of benchmarking (Vermulen , 2003).The complexion of competition has changed towards a more collaborative approach while taking care to improve competencies and capabilities. This results from the realization that other firms facing the same turbulence in the business environment are doing things better. A study by Voss et al (1997) identified an indirect link between benchmarking and performance as it increased understanding on firm's position relative to its competition. Ultimately the aim is to transfer the winning practice to their operation.

1.1.1 Benchmarking and Supply Chain Performance

Benchmarking can be defined as the process of improving performance by continually identifying, understanding and adapting outstanding practices and procedures found inside and outside the organization (Jackson & Lund, 2000). According to Handfield et al (2009) benchmarking is the continuous measurement of products, services, processes, activities and practices against a firm's best competitor or those companies recognized as the industry or functional leaders. It requires measuring performance against that of the best in class companies, determining how they achieve performance levels and using that information as a basis for establishing a companies performance targets, strategies, and action plans. It does not always involve comparison against competition especially in supply chain management where benchmarking data is easily obtainable from non competition with common process or functional activity.

Benchmarking is defined by the Water Environment Research Foundation (2004) , as the systematic process of searching for best practices, innovative ideas, and highly effective operating procedures that lead to superior performance and then adopting those practices, ideas and procedures to improve the performance of ones own organization. This definition takes into account three key aspects of benchmarking namely; it is systematic, it involves seeking out best practices that cause superior performance and that it entails adapting these to the organization of interest. According to the American productivity and quality centre, benchmarking is defined as the process of identifying, understanding and adapting outstanding practices and processes from organizations anywhere in the world to help your organization improve its performance.

Benchmarking is important as a tool to emulate existing best practices in the industry for achieving continuous improvement in business operations. The changes in the competitive environment are so rapid and it calls for a closer watch on the environment and the ability to adapt quickly to any stuff in the operating platform. There are several types of benchmarking namely; performance benchmarking, process benchmarking, strategic benchmarking, internal benchmarking, functional benchmarking, generic benchmarking and competitive benchmarking.

Benchmarking has various benefits. It provides a stimulus for making breakthrough change initiatives reality and it broadens an organizations experience base. It also provides an independent assessment of how well a process is operating by evaluating similar processes in the organization (Watson, 1994). Benchmarking contributes to competition fundamentals such as customer focus, organization learning, innovation and motivation. Benchmarking provides a gap analysis tool between where a company is and the best in class organizations. Innovations and technical breakthroughs are identified and their applicability assessed. Most benchmarking gurus agree that benchmarking focus on how to improve any given business process by exploiting best practices. Best practices are the cause of best performance (Coughlan, 1996). Studying best practice provides the greatest opportunity for gaining strategic operational and financial advantage. Benchmarking also promotes the evolution of a learning culture through the organization. It is the key to continuous improvement, total Quality management and competitiveness over along period. Making better informed decisions based on getting more and better information ensure less chance for error.

Through benchmarking, a business is able to apply best practices in order to achieve best performance. In a competitive market place quality improvement tools can help align key business process in the supply chain to achieve higher customer satisfaction, business competitiveness and bottom-line results (Cassell et al., 2001). According to Hinton (2001), benchmarking is widely recognized in the private sector in the search for and incorporation of best practice to achieve competitive advantage.

The supply chain consists of suppliers, manufacturing centers, warehouses, distribution centers and retail outlets .It also consists of raw materials, work in progress, inventory and finished products which flow between the facilities. Each basic supply chain is a chain of source, make and deliver processes. Supply chain management is a set of approaches utilized to efficiently integrate suppliers and manufacturers, warehouses and stores so that merchandise is produced and distributed at the right quantities to the right locations and at the right time in order to minimize costs while satisfying service level agreements (Handfield et al., 2009).

Modern supply chain performance measures fall into two broad categories, effective and efficiency measures. Effectiveness is the level to which choosing a certain course of action management can meet a previously set goal. Efficiency refers to the relationship between planned and actual sacrifices made to realize a previous goal. All measure includes a standard against which to evaluate performance. We still need to compare actual improvement against a set target. Meeting the target therefore brings the value to an organization Therefore each performance measure should include actual performance versus targeted performance (Handfield et al., 2009).

The worlds most accepted framework for evaluating and comparing supply chain activities and their performance is the supply chain operations reference (SCOR) process reference model. It is organized around the five management processes of plan, source, make, deliver, and return. It is the product of the supply chain council (SCC).It is a process reference model designed for effective communication among supply chain partners. The standard SCOR metrics enable measurement and benchmarking of supply chain performance. Level 1 metrics are calculations by which an implementing organization can measure how successful they are in achieving their desired position within the competitive market space .SCOR metrics are used in configuration with performance attributes. The performance attributes are characteristics of the supply chain that permit it to be analyzed and evaluated against other supply chains with competing strategies. These performance attributes include reliability, responsiveness, agility, cost and assets (Simchi-Len (2009).

Supply chain performance evaluation system represents a formal approach to monitor and evaluate the supply chain performance. This helps to support better decision making by understanding areas requiring improvement, support better communication across the supply chain and provide performance feedback which gives an insight on how well each is meeting their objectives .Finally this also motivates and directs behavior towards desired results.

Performance benchmarking is an ongoing approach for establishing performance standards, processes, measurements and objectives in supply chain. It is an approach used by functional level executives and managers. It has definite applications when establishing supply chain performance objectives and action plans. It is the continuous measuring of products services, processes, activities and practices against firm's best competitors or

those companies recognized as the industry leaders. It requires measuring performance against that of the best in class companies, determining how they achieve performance levels and using the information to establish performance targets strategies, and action plans Benchmarking for the supply chain can be done on non competition firms whose functions are common (Handfield, et al., 2009).

1.1.2 Total Kenya Ltd

The petroleum industry business involves procurement of refined or crude oil, distribution to retail outlets and industrial users and retailing the product to users. The industry was liberalized in 1994 after which more independent oil companies entered the industry and thus increasing competition (Amolo 2002).Most of these companies started operating in Kenya after the collapse of the crude oil and product prices in 2001 (Chepkwony 2002) By the end of May 2011 there were 57 oil marketing companies licenses by the ministry of energy to import and process petroleum products in Kenya as per Energy Regulatory commission (ERC) list of valid petroleum licenses. This entry of the independent dealers in the market in addition to the demands of an increasingly competitive global economy and customer demand for efficient service (Amyzulckan,2002) have subjected the oil companies to stiff competition and hence need to improve their operations and expand their market share (Tuitoek 2007).

Total Kenya Limited is part of the TOTAL Group which is the 4th largest oil and Gas Company in the world operating in over one hundred countries. It deals with marketing of all the oil products and also other services not within the mainstream oil products. The company has been operating in Kenya since its incorporation in 1955 as OZO East Africa Ltd. OZO East Africa was changed to Total Oil Products East Africa Limited on January 1, 1963. In June 1 1991 the last change of name to Total Kenya Limited was done. In

1988 Total Oil Products East Africa Limited issued the first initial public offering becoming the first multinational oil company to be quoted on the Nairobi stock exchange. It is still the only one to this day. At the end of 2009 the company acquired the Chevron business. This is therefore a company that has had a long presence in Kenya (http://www.total.co.ke/os/oskenya.nsf/vs-opm/).

Total Kenya Limited is one of the country's major oil and gas marketing companies with over one hundred and seventy service stations and a market share of 27.6%. It provides superior services, hospitality to other marketers and has attractive conveniently located stations in the retail network. It is currently a brand leader in the Kenyan market both in fuels and in the Liquefied Petroleum Gas (LPG) retail market. It was the first oil company in Kenya to be awarded the ISO 9002 certification for its service station network and for its Customer order delivery process which was achieved in November, 2003 (http://www.total.co.ke/os/oskenya.nsf/vs-opm/).

Persistence logistical constraints faced by the industry namely pipeline pumping capacity limitation ,the unreliability of the refinery sometimes occasioning stock outs in upcountry markets and inadequate storage capacity have greatly affected performance. These three main issues need to be improved in order to improve the company and oil sector performance. Other factors affecting performance are economic recovery, stability of world crude prices and concerted effort by the Government and other parties to address the supply constraints experienced in the oil industry (Chairman's statement, 2009/10 financial results).

Total Kenya Limited is committed to meeting customers' expectations through improved service in terms of equipment availability in good working condition and safe facilities in all our service station outlets, customer sites, depots and other company facilities. The company has 24 hours maintenance service on all days by experienced maintenance teams carefully vetted and selected in several disciplines to cover all the company needs (http://www.total.co.ke/os/oskenya.nsf/vs-opm/).

Total Kenya Ltd has a range of lubricants including Quartz (for petrol engines) and Rubia (for diesel engines) sold through the service station network. TKL is also strong in the area of industrial lubricants and has established a laboratory for the testing of such lubricants, the only facility of its kind in East Africa. Total Kenya limited offers the widest range of LPG products to the customer ranging from Baby Meko to 50kg cylinders. The Company also supplies bulk gas to large consumption customers. Total Kenya Limited also has various services such as the unique Auto Express/Pit stop service, and eighteen All Seasons shops, the Firestone and Michelin Tyre centers, the Auto Clean/Car wash and restaurants (http://www.total.co.ke/os/oskenya.nsf/vs-opm/).

Liberalization of white oil transportation modes, middle east instability,legalalization of minimum operational stocks, introduction of 2% suspended duty on all refined petroleum products imported into the country are some of the challenges (Midwa ,2008).Other challenges are the oil industry tender system for importing crude oil, all imported finished products to be offloaded at Kenya Pipeline Company Ltd (KPC) Mombassa and advance tax payment on all imported finished petroleum products (kahira 2006).The most recent challenges have been the introduction of price controls and use of the government owned

oil company National Oil Cooperation of Kenya (NOCK) to stabilize prices by according them 30% importation of the finished products(Daily Nation March 23rd 2011 pp 64).

The supply chain in Total Kenya Ltd. is such that there is planning and supply department in charge of the sourcing and supply of main products, specialties, services and operations department in charge of distribution of products, warehousing, aviation operations and facilities and other infrastructure. The sections in planning and department in charge of these activities are supply main products, supply specialties, clearing and forwarding and purchasing. The sections in the operations department are distribution, depots and dispatch, aviation operations and engineering. The customer service section handles all customer requirements along the supply chain. This is according to the Total Kenya Ltd. Organization structure for 2010 (htttp://www.total.co.ke/os/oskenya.nsf/vs-opm/).

1.2 Statement of the Problem

The impact of the current challenges of hyper competition, high costs, enlightened society environmental issues, regulatory issues and growth on petroleum industry in Kenya has been great. In addition specific challenges including insecurity in the Indian Ocean, introduction of price controls, inefficiency of the refinery, lack of piping capacity with increased demand, increased customer awareness and stringent environmental and regulatory issues from government bodies such as the national environment management authority, NEMA and ERC have had an impact to the oil industry. Therefore the major oil players including Total have lost substantial part of their market share and the environment is becoming increasingly competitive and challenging (Amolo, 2002).The control of fuel prices by the government through the energy regulatory commission and the consequences which can result from procurement blunders with the use of the oil industry tender system are other challenges (Daily Nation March 23rd 2011 pp 64).

Mageto (2009) sought to determine how supply chain performance relates to supply chain responsiveness within Nairobi supermarkets. The study established a direct relationship between supply performance and supply chain responsiveness. He also identified various challenges facing the supermarkets in customer responsiveness. Wanjiku (2008) explored the supply chain management practices at the University of Nairobi and the benefits derived from the practices together with the challenges. He found that the institution is yet to fully embrace supply chain management practices.

Waithira (2008) studied the practice of supply chain management at United Nations Children Fund Kenya country office. His findings indicated that the company embraced the supply chain management with 66% of the respondents satisfied with the practices in place. He also identified the challenges faced by the company in their supply chain management. Orukoh (2007) studied the supply chain management practices in Numerical machining Complex ltd. His findings were that the company though aware of these practices did not practice them.

Gwako (2008) studied supply chain performance measurement in aviation industry aimed at establishing the metrics and benefits of supply chain performance measures. He found out that the company measures the supply chain performance using quality ,effectiveness, of procurement, activities, flexibilities, of suppliers, and lead time Ogolla (2006) focused on influence of benchmarking on performance at Barclays bank in terms of customer satisfaction, inventory turnover, growth and operating costs as well as understanding of benchmarking in the banking sector. He found that Barclays bank used world-class benchmarking and that it led to operations performance improvement.

Tuitoek (2007) studied benchmarking health safety and environment in the oil industry and found out that few companies benchmarked their health, safety and environmental practices. He found out few oil companies benchmark their health safety and environment performance measurement practices and significant number of those who benchmark concentrate on internal benchmarking. The study sought to establish the status of the performance of the supply chain based on performance measures and evaluate the practice of supply chain performance benchmarking and hence establish its impact on performance. The supply chain performance measures are geared towards enhancing benchmarking which improves performance .This study is therefore important in order to establish the status of supply chain performance and it's benchmarking and establish its link to performance and any challenges related to the practice. The study therefore sought to answer the following questions.

1. What is the status of performance benchmarking at Total Kenya limited?

2. How does benchmarking impact on performance?

3. What are the challenges facing Total Kenya Limited in undertaking supply chain performance measurement and performance benchmarking?

1.3 Objectives of the study.

The overall objective was to identify the impact of performance benchmarking on supply chain performance through use of supply chain performance measures. The specific objectives were:

(i) To establish the status of performance benchmarking at Total Kenya Limited.

(ii) To establish the relationship between performances benchmarking and supply chain performance.

(iii) To find out the challenges faced by Total in the measurement and benchmarking of its supply chain performance.

1.4 Value of the Study

The findings will provide Total Kenya managers within the supply chain to appreciate the importance of supply chain performance measurement and benchmarking and hence analyze the input on use of the same to enhance further improvement face challenges and manage the supply chain more effectively and therefore be able to retain market leadership. It will help breakdown reluctance to change from management.

Other oil firms will have a strong background based on the findings to measure their performance and benchmark themselves against their peers and identify the best practices applicable to address their challenges and the process of carrying out the same. Hence this will help identify best functional practices. This will help in establishing performance standards, processes, measurements and objectives especially among the smaller oil firms referred to as independent dealers.

The study will contribute to the body of knowledge both in the academics and research in the area of supply chain management and benchmarking in Kenya. The study will also identify areas that require attention to improve operations in the supply chain. This is important to the various stakeholders through understanding the impact of supply chain performance measures and benchmarking on their performance along the supply chain.

CHAPTER TWO: LITERATURE REVIEW

2.1 Supply Chain Management

Many organizations today are overcoming their state of complacency and are responding to meet increased challenges of international competition in different ways. In a survey conducted by Dellotte and Touché in the early 1990s on the relative effectiveness of various tools, benchmarking was rated second highest after re-engineering. (Fink 1993, Burpo 1998).The study was to find out how US manufacturing firms have been effectively using benchmarking as a management tool to make business improvements.Fink (1993) notes that although many organizations recognize that continuously searching for and applying the best practices is the only way to be the best many of them are still struggling to achieve benchmarking effectiveness. Benchmarking adds value not only by improving a given process but also by helping companies evolve more quickly and effectively into learning organizations and facilitate transition to a total quality culture.

Andersen et al., (1999) describe an approach to improving supply chain through benchmarking. The idea of identifying "best practice" through the establishment of benchmark process in other businesses or industries is well established and managers should be well aware of the principles involved in such a process. Andersen et al.,(1999) set out the core elements of the process as: Measurement of the firm's and the partner's performance level, Comparison of performance, practice and processes, learning from the benchmarking to improve one's own processes and improvements that follow from such learning. They identified several areas for benchmarking that relate to the supply chain and its management: This was in the areas of: application of information technology, make-or-buy procedures, supplier searches, and progress reporting and supplier-customer relationships.

Supply chain management seeks approaches to efficiently integrate suppliers, manufactures, warehouses, and stores so that merchandise is produced and distributed at the right quality to the right location and at the right time in order to minimize costs and satisfy service level requirements. One key approach to this is therefore to find out who does what best, or is perceived to be best at expediting the particular process (Bunney et al., 1995).

Supply chain management takes into consideration every facility that has an input on cost. The objective of supply chain management is to be efficient and cost effective across the entire system. The emphasis is therefore a system approach. Supply chain management therefore encompasses all the levels from strategic through tactical to operational level. Supply chain management encompasses the planning and management of all the activities involving sourcing and procurement, conversion and all logistics management activities. Logistics management plans, implements, and controls the efficient and effective flow and storage of goods and services and related information between point of origin and point of consumption. The key issues in supply chain management include product design, supplier selection, purchasing decisions, inventory policies, warehousing, transport strategies scheduling, routing, distribution network configuration, and truck loading. Hence companies today cannot afford to ignore supply chain management and expect to survive (Handfield et al., 2009).

The supply chain consists of suppliers, manufacturing centers, warehouses, distribution centers and retail outlets. It also includes raw materials, work in progress, inventory and the finished products which flow between the facilities. Each basic supply chain is a chain

of source, make and deliver processes. Supply chain management is a set of approaches utilized to efficiently integrate suppliers and manufacturers, warehouses and stores so that merchandise is produced and distributed at the right quantities to the right locations and at the right time in order to minimize systemic costs while satisfying service level agreements.

According to the council of supply chain management professionals (CSCMP), supply chain management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly it also includes the coordination and collaboration with channel partners which can be suppliers, intermediaries, third party service providers, and customers. In essence supply chain management integrates supply and demand management within and across companies. Supply chain management is an integrating function with primary responsibility for linking major business function and processes within and across companies into a cohesive and high performing business model. It includes all of the logistics management activities as well as manufacturing operations and it drives coordination of processes and activities within and across marketing, sales product design, finance and information technology.

According to Hand field et al., (2009) supply chain management takes into consideration every facility that has an impact on cost and plays a role in making the product conform to customer requirements It aims to be efficient and cost effective across entire system and encompasses the firms activities from strategic through tactical to operational levels. The main aspects in supply chain management are distribution network configuration,

inventory control, product sourcing, supply contracts, distribution strategies, supply chain integration, strategic partnering, information technology and decision support .

Distribution network configuration involves how to locate warehouses, their capacities and set transport flows between the facilities and customers for efficient operations in order to minimize costs of transportation inventory and satisfy customers. Inventory control covers decisions on re-order level and quantity of inventory in order to address demand and supply constraints based on demand predictions. Production sourcing addresses the need to balance production and transportation needs so that cost effective production batches are done in order to have a cost effective transportation of these goods. Supply contracts seek to address such aspects as volume discount, revenue sharing and supply chain performance. Other aspects of pricing, lead times, quality are defined in the contract.

Distribution strategies consider the level of decentralization of their distribution system and also level of collaboration with competition e.g. sharing inventory etc. Consideration of integrating supply chain and partnering with other external partners in order to gain strategic advantage is the role of supply chain strategy. It also includes sharing information within partners and the type of partnership possible. Information technology and decision support system consider aspects such as the available data in the supply chain and the effect of internet and electronic commerce and how they can be used to gain competitive advantage e.g. use of enterprise resource planning ERP, transport management systems and warehouse management systems.

2.1.1 Supply Chain Performance Evaluation.

Supply chain performance evaluation system represents a formal system approach to monitor and evaluate the supply chain performance. This helps to support better decision

making by understanding areas requiring improvement, support better communication across the supply chain and provide performance feedback which provides an insight on how well each is meeting their objectives .Finally this also motivates and directs behavior towards desired results. However there are also problems associated with the performance evaluation mainly too much data and wrong data, performance measures being short term focused and lack details. Many measures drive behavior that is not needed (Handfield et al., 2009).Neely et al (1995) defined performance measurement as the process of quantifying the effectiveness and efficiency of action. Petron and Panciroli (2002) argue that customers usually retain supplies who achieve best score on price, quality, production, flexibility, and delivery times. Hill (2000) addresses competitive priorities of price, cost, reduction, delivery, quality, conformance and flexibility. According to Lambert and Phohlen (2001) the performance of a supply chain can be viewed as a system of measures such as quality, delivery, flexibility and cost or price.

The efficiency of the supply chain can be measured based on the size of the inventory investment in the supply chain. This is measured relative to the total cost of the goods that are provided through the supply chain. Two common measures to evaluate supply chain efficiency are inventory turnover and weeks of supply. Inventory turnover is the ratio of the cost of goods sold to the average aggregate inventory value. The cost of goods sold is the annual cost for a company to provide the goods and services to the customers while the average aggregate is the total cost of all items held in the inventory for the firm valued at cost.

Modern supply chain performance measurement contains variety of measures. These measures fall into two broad categories, effective and efficiency measures. Effectiveness is

the extend to which choosing a certain course of action management can meet a previously set goal. Efficiency refers to the relationship between planned and actual sacrifices made to realize a previous goal. All measure includes a standard against which to evaluate performance. We still need to compare actual improvement against a set target. Meeting the target therefore brings the value to an organization Therefore each performance measure should include actual performance versus targeted performance.

According to Handfield et al (2009) most supply chain measures fall under price performance ,cost effectiveness, revenue, quality, time and delivery responsiveness, technology, innovation, physical environment and safety, asset and integrated supply chain management , administration and efficiency, government and social, internal customer satisfaction, supplier performance and strategic performance. Hayes and wheelwright (1981) were the first to present methods of addressing operational strategy by means of quality, cost, flexibility and delivery. Pagell and Krause (2002) presented a table of performance items for assessing organizations strategy e.g. quality which addresses reliability, durability, conformance, delivery speed, flexibility (volume, mix) and cost in terms of price or total cost.

Price performance measures include the actual price versus the planned price, comparison of the actual prices between divisions in the organization. Actual price can also be compared to the market index which is the published market prices. Cost effectiveness measures include cost changes resulting from change in strategy or practice in the organization. Cost avoidance represents the cost paid and a potentially higher price which could have been paid. Quality measures express a maximum number of levels of defects allowable for any particular product or service. It includes mean time between failures, and

number of defects from individual suppliers. On time delivery measures indicate the degree to which suppliers are able to meet customer schedule requirements .The elements of such measures include due dates, delivery windows, and acceptable early or late arrivals. Cycle time reductions identify total cycle time focusing on reduction through reduction of delays. Bemoan 1999 defines flexibility as the ability of a company to respond to market changes. It is the management of reacting to changes in demand by preserving the resources of time, money, people, plants and supplies until required (Harrison 2001).

Physical environment and safety measures track the achievement of environmental and safety goals associated with compliance. Asset management measures which include inventory turnover, value of inventory investment and weeks of supply of inventory. Transport cost reduction involves tracking actual costs against set objectives; demurrage and detention costs, transportation carrier quality, delivery performance and transportation lead time measures. Chibba (2007) observed that a primary efficient supply chain measure is cost.

Customer order measures evaluate how well an organization is satisfying its commitment to downstream customers. It includes the percentage of on time delivery, total time from order to delivery, returned orders and warranty claims. Internal customer satisfaction measures indicate their satisfaction with purchasing. Supplier performance measures evaluate suppliers in areas of technology contribution, quality, responsiveness delivery performance, cost and environmental performance.

Jonsson (2008) describes the supply chain operations reference model (SCOR) which was developed by the supply chain council. This model has several supply chain attributes and related measures. The supply chain reliability attributes measure the perfect order fulfillment which gives the percentage of orders meeting delivery performance with complete and accurate documentation and no damage. Supply chain responsiveness, measure the order fulfillment cycle time which gives the average speed at which the supply chain delivers product to customers. Supply chain flexibility measure the upward supply chain flexibility which gives the number of days required to increase delivery by 20% .The upside supply chain adaptability which gives the amount of increased productivity an organization can attain and sustain in 30days.The reverse of which is the downside supply chain adaptability.

Supply chain management costs SCMC measure all direct and indirect expenses associated with operation of business processes across the supply chain. The cost of goods sold measure the supply chain expenses that is the total cost to manage the order processing acquire materials manage inventory and manage supply chain finance and information systems. Supply chain asset management measure cash to cash cycle time which is the time required for investment in raw materials to flow back in an organization that is between paying for materials and getting paid for product. The delivery performance to request measures the number of orders that are fulfilled before the customers requested date. Once specific company metrics are calculated they are compared to those of the industry benchmarks such as the average and best in class. The standard SCOR metrics indicated in table 1 below enable measurement and benchmarking of the supply chain performance. This enables identifying the company's advantages as well as opportunities for supply chain improvement (Simchi-len et al., 2009).

2.1.2 Performance Benchmarking

This is an ongoing approach for establishing performance standards processes, measurements and objectives in benchmarking. It is an approach used by functional level executives and mangers .It has definite applications when establishing supply chain performance objectives and action plans (Handfield et al., 2009). It is the continuous measuring of products services, processes, activities and practices against firm's best competitors or those companies recognized as the industry leaders. It requires measuring performance against that of the best in class companies, determining how they achieve performance levels and using the information to establish performance targets strategies, and action plans .Benchmarking for the supply chain can be done on non competition firms whose functions are common.

Table 2.1 SCOR Performance Attributes and Associated Level 1 Metrics

PERSPECTIVES	METRICS	MEASURE
Supply chain reliability	On time delivery	The percentage of orders met within the schedule
	Order fulfillment lead-time	The average cycle time consistently achieved o fulfill customer orders
	Perfect order fulfillment	The percentage of orders meeting the delivery performance with complete and accurate documentation and no damage
Flexibility and responsiveness	Supply chain response time	Average speed at which supply chain delivers products
	Upside production flexibility	The maximum sustainable percentage of quantity that can be achieved in 30 days
	Downside production flexibility	The reduction in quantities ordered in 30 days without inventory costs
Expenses	Supply chain management cost	The sum of the costs associated with the SCOR level process.
	Warranty cost as a percentage of revenue	Percentage of warranty cost to revenue
Asset /utilization	Total inventory days of supply	Number of days the inventory can satisfy the demand.
	Cash to cash cycle time	The time it takes for an investment to flow back to the company
	Return on supply chain fixed asset	The return an organization receives on its capital invested in supply chain fixed assets.

Source: Supply chain Council (2006) supply chain operations reference model version 8.0.Available at www.supply chain org.com

2.1.2.1 Types of Benchmarking

There are various types of benchmarking as identified by numerous authors. These include**,** strategic benchmarking, operational benchmarking and support activity benchmarking (Handfield et al., 2009). Strategic benchmarking involves comparison of one firm Market strategies against those of another firm. It usually involves comparison against leading competition allowing a firm to gain an in-depth understanding of their market strategies .This knowledge enable the firm to develop strategies and plans to counter the competition.

Operational benchmarking focuses on different aspects of functional activity and identifies methods to achieve best in class performance. Selecting the function and the activities to benchmark are critical to success of the operational benchmark. Forms of benchmarking in this category include product benchmarking and process benchmarking. During Support activity benchmarking process support functions within an organization demonstrate their cost effectiveness against external providers of the same support activity .It is used as a way of controlling internal overheads and rising costs.

Based on Cartin (2002) and Nahamias (2000) other types of benchmarking include problem based benchmarking, product benchmarking, functional benchmarking, best practice (external) benchmarking and strategic benchmarking. Problem based benchmarking is used to solve specific problems which are difficulty to solve by other improvement techniques. This therefore provides a solution as well as a major improvement. Product benchmarking is the process of tearing down a competitor's product and learning from its design and construction. It is used where organization consider their position in relation to performance characteristics of key products and services

Functional(generic) benchmarking focuses on the process and is only possible for companies willing to share information. The companies therefore compare the particular business functions among themselves. Best practice benchmarking focuses on management practice rather than specific process and may consider factors such as work environment and salary incentives from employees in firms with exceptional performance

2.1.2.2 Approaches to Benchmarking

There are three main approaches to benchmarking namely internal benchmarking, competitor benchmarking and external benchmarking. Internal benchmarking is where a single process is compared with other similar processes inside the organization. It only involves participants from a single company hence making it a simple process. It can be very rewarding since the efforts tend to be very small and data quality is good as instructions are uniformly understood across the organization. The benefits however become minimal with time calling for a different approach for a wider perspective.

Competitor benchmarking involves sharing information with other organizations which are usually competitors. It is often conducted through consultants who facilitate the data collection and analysis and comparison of the metrics in order to ensure confidentially and legal considerations. Its main advantage over internal benchmarking is presence of different cultures among compared companies offering a wide range of performance and practices (Guillard, 2002).External benchmarking is conducted between companies operating different businesses but facing similar issue and employing same functions. It is potentially the most rewarding owing to the variety of cultures and practices. Performance breakthroughs are most likely to result form this type of benchmarking (Guilard, 2002).

2.1.2.3 Benefits of Benchmarking

The benchmarking practice helps identify the best business or functional practice to include in its business plans which can lead to direct performance improvement it can also breakdown reluctance to change. It also serves as a source of market intelligence through providing information about the market and customers. Valuable professional contacts can also result from the benchmarking process (Handfield et al., 2009).Benchmarking broadens the organizations experience through exposure to other processes used by other benchmarking partners. Benchmarking acts as stimulus for achieving change initiatives which contribute to innovation in the company. Organizational learning and evolution of a learning culture are also other benefits from benchmarking. Being a gap analysis tool between the company and the best in class benchmarking helps identify the best business practice to use in company plans and in the process contribute to motivation. (Camp, 1989)

2.1.2.4. Challenges in benchmarking

Benchmarking being a change agent requires time, senior management support and adequate resources. It has to be closely linked with the critical success factors and strategic goals. It therefore requires the organization to be fully committed to continuous improvement in order to succeed (Vaziri, 1992).Finding benchmarking partners willing to participate in the benchmarking process is one of the most difficult tasks in benchmarking. Identifying companies which are comparable in size, market conditions and industry and with exceptional performance to be emulated and willing to share is quite a major challenge. (Bjorn et al, 1998).Willingness of benchmarking partners to surrender the required information is usually low. This is especially in terms of numerical performance data which often involves financial information. (Bjorn et al, 1998).

The fact that the best in class performance is usually a changing target is a big weakness since organizations continue to innovate and aim higher. This therefore requires organizations to innovate instead of imitating as is the case with benchmarking (Prabir ,1996).In addition organizations must continuously be outward looking so that they do not waste resources in benchmarking items that become redundant very fast hence the challenge to carefully select what to benchmark (Zairi,1994).The most serious shortcoming of benchmarking as a strategic tool is the fact that it strives to provide a platform for all while in actual fact the only way to the top is to develop state of the art competencies is the core business(Camp, 1989)

According to Basterfiel et al., 2006, there is usually over reliance on quantitative data while benchmarking. This focus on the data as opposed to the processes producing the data can be misleading as the data could be manipulated. There is also difficult in obtaining useful information from competitors since they may be uncooperative. Gathering this information requires considerable effort and resources. There can also be ethical and legal issues about some intelligence activities such as paying of competitors employees for information. According to Buyukkczan and Marie, 1998, benchmarking methodology lacks formal modeling tools and theoretical foundations. Benchmarking gives too much information to ones competitors is the defensive approach taken by organizations (Buyukczan and Marie, 1998).This perception leads to the major challenge of getting information from competitors.

2.1.2.4 Benchmarking Critical Success Factors

For benchmarking to succeed it must become an accepted process within the firm function and not simply another fashionable program. Personnel must view performance benchmarking as a permanent part of a system that establishes goals, objectives, and

competitive strategies. Executive management must also support the process. The firm must also be willing to commit the necessary requirements to data gathering. Managers must be willing to learn outside the farm and hence willing to change (Handfield et al., 2009).The level of experience in the organization plays a crucial role in the success of the benchmarking initiative.Organizations experience, acceptance and understanding of benchmarking are essential for successful benchmarking, (Norman, 2000).A firm must identify which company is best in class for an activity, identify why that company is best and quantify the benchmarked performance measures. The success of benchmarking depends on detailed and accurate benchmarked data and information that becomes part of a firm's action plans and performance objectives. Managers need to view benchmarking as a way to learn from outside companies and continuous improvement of internal processes.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research Design

This was a case study which aimed at assessing Total Kenya limited application of supply chain performance measurement practices and performance benchmarking to improve the performance of its supply chain. According to kothani (1990) the case study has a unique strength of its ability to deal with a full variety of evidence, including documents, artifacts, interviews and observation. This is because it involves a careful and complete examination of a social unit, institution, family, cultural group or an entire community and embraces depth of a study. The case study was chosen because the objectives of the study require an in-depth understanding of the implementation of this process.

3.2 Population

The study population comprised of all the section heads and their immediate subordinates in the respective operations department and planning and supply department and the customer service. These being departments handling the supply chain and therefore involved in all aspects of the supply chain activities. The population of interest was the entire planning and supply, customer service and operations functions in Total Kenya Ltd, having been identified as the main participants in the supply chain. Section managers head each of the various sections and below them are sub -section assistant managers or supervisors. There are ten section managers and twenty five sub-section assistant managers or supervisors distributed in the entire region. The total number of respondents was therefore thirty five.

3.3 Data Collection

Primary data was collected by use of a structured questionnaire. The questionnaire was prepared and structured to meet the information needs. It was delivered to the respondents by email, hand or the company's internal mail delivery system and returned the same way. The questionnaire was structured in four parts. Part A was used to capture the background information of the respondent and the company. Part B was used to evaluate the supply chain performance of the company based on performance measures as perceived by the respondents. Part C was used to determine the performance benchmarking done by the company and asses the benefits. Part D assessed the challenges of supply chain performance measurement and performance benchmarking.

The sources of evidence were documents, interviews, archival records. The documents used included journals, magazines, newsletters, and other internal documents available in the company. The respondents comprised section heads of the respective supply chain departments and those immediately reporting to them. These were the functional level managers and hence responsible for the implementation function in the company. The section heads are actually in charge of the supply chain and therefore posses all the specific details of the study.

3.4 Data Analysis

The data collected was edited for accuracy, uniformity, consistency and completeness. For objective 1 in establishing the status of the benchmarking, the data of all responses was tabulated to give an overview of the level of benchmarking. The mean and standard deviation was then calculated to indicate the overall rating of the specific aspect of benchmarking. All the findings were categorized into the respective perspective for all the attributes studied. The correlation analysis was used to establish the relationship between

the performance benchmarking and supply chain performance aspects which is the second objective of this study. This was by establishing the means of the performance of each of the aspects categorized in respective perspectives. All the findings were categorized into the respective perspective for all the attributes with the measures in the rated mean values. The correlation coefficients between the performance for all attributes given in mean and the level of benchmarking given in the rated mean for all the attributes were then established by use of the computer software SPSS for each perspective category covering all related aspects. The benefits of the performance measurement and benchmarking were established through getting the mean of the various benefits in the questionnaire. The challenges of the supply chain performance measurement and benchmarking being the third objective were established through the mean and standard deviation of the responses in each of the identified challenges.

CHAPTER FOUR: DATA ANALYSIS RESULTS AND DISCUSSION

4.1. Introduction

This chapter presents the analysis and interpretation of the research data. The purpose of the study was to investigate the relationship between benchmarking and supply chain performance. Structured questionnaire was sent to thirty five section heads or supervisory staff within the supply chain of the company. Out of this twenty five respondents actually filled in the questionnaire giving a response rate of seventy one percent which was representative enough to allow data analysis to continue. The data is represented in form of means, standard deviation and correlation matrices. It covers the study of supply chain performance at Total Kenya Ltd.

4.2. Background information

Respondents were asked questions on various aspects of their position at work in order to help identify their role in the supply chain and importance placed on that role. The respondent's engagement in the supply chain is indicated in Table 4.2 below. The results indicate a response rate of 71.4%.Therefore only 28.6% of the respondents did not respond. This could be attributed to pressure from work and unwillingness to reveal confidential information. From the distribution of the respondents, majority were from the depots, this being the largest section with the most responsibility in the supply chain logistics.

Table 4.2 Distribution of Respondents

Functional section	Frequency	Percentage
Distribution	3	12%
Depots	7	28%
Purchasing	4	16%
Procurement	3	12%
Engineering	4	16%
Customer service	4	16%
Total	25	100%

Source: Research data (2011)

4.3 Supply Chain Performance

Regarding supply chain performance respondents were asked to indicate their perceived performance of various supply chain performance measures as indicated in the questionnaire. This perceived performance was based on the level of meeting objectives for each performance measure and hence the basis of evaluation. Their responses are as analyzed in Table 4.3 below. The results in the below table show that Compliance to safety performed the best with a mean score of 4.2 indicating a very good performance. Actual price versus market index scored a mean of 3.92 which also indicated good performance. On time delivery with no damage topped the list of on time delivery measures with a mean score of 3.88 Out of eight performance measures in the on time delivery category 50% of the measures were perceived to have been within the set objectives while the rest were slightly below. Only 22% of the price and cost measures were perceived to have performed below standards. Only 11% of the quality aspects were below standards the rest of them being within standards.

Table 4.3 Performance of the Supply Chain

Delivery to customer measures

	N	Mean	Std. Deviation
Percentage of on time delivery with no damage	25	3.8800	.83267
Order fulfillment cycle time in total time	25	3.4400	.65064
Supplier efficiency and reliability	25	3.0400	.35119
Deliveries done within due dates in number	25	3.0000	.57735
Transport lead time in hrs per km	25	2.9200	.27689
Delivery performance levels of transporters	25	2.8400	.55377
Deliveries at acceptable late/early timelines	25	2.7600	.59722
No. of orders fulfilled before due date	25	2.7200	.67823
Valid N (listwise)	25		

Price and cost measures

	N	Mean	Std. Deviation
Actual price versus market index	25	3.9200	.90921
Amount of transport and detention costs.	25	3.2400	.59722
Supplier cost of services rendered	25	3.2400	.52281
Amount of demurrage and detention costs	25	3.2000	.70711
Annual cost of products sold	25	3.1200	.66583
Comparison of price between divisions	25	3.0800	.64031
Cost avoidance(less cost paid)	25	3.0000	.70711
Actual price versus planned price	25	2.8400	.55377
Cost changes from change in strategy(amount	25	2.6000	.50000
Valid N (listwise)	25		

Quality and safety Measures

	N	Mean	Std. Deviation
Compliance to safety (no of non conformities)	25	4.2000	.76376
Supplier performance on safety & environment	25	3.4800	.71414
Maximum number of allowable defects	25	3.4000	.50000
Number of defects from individual supplies	25	3.3200	.47610
Mean time in hrs between equipment failures	25	3.2800	.54160
Number of warranty claims	25	3.2400	.72342
Transporter carrier quality	25	3.0800	.75939
No of Returned orders by customers	25	3.0800	.64031
No of Internal customer complains to purchasing	25	2.8400	.37417
Valid N (listwise)	25		

Source: Research data (2011)

4.4. Supply Chain Performance Benchmarking

Performance benchmarking is about being aware of performance achieved by other organizations or functions and continuously applying the best in class standards. After establishing the performance of the supply chain measures respondents were asked to indicate the level of benchmarking placed on these measures. Table 4.4 represents the findings. The status of performance benchmarking being the first objective was established as indicated in Table 4.4 below. Data analysis was by mean scores and evaluation based on the scale of 1-5 with 5 indicating the highest level of benchmarking and 1 the least. Table 4.4 below shows compliance to safety was the highest benchmarked with a mean score of 4.56.A study by Tuitoek (2007) indicated that some companies in the oil industry benchmarked their safety and environment of which TKL is one of them as per these findings. It is followed by Supplier performance on environment with a mean score of 4.44.On delivery to customer measures the most highly benchmarked was percentage of on time delivery with a mean score of 4.36 while order fulfillment cycle time follows with a mean score of 4.32.Actual price versus market index top in the price and cost measures with a mean score of 4.16 followed by Demurrage and detention costs with a mean score of 4.12.The least benchmarked of all was orders fulfilled before due date with a mean score of 3.28 which was an indication of a moderate level of benchmarking. The standard deviation in all cases is less than one indicating that there was little variance in the results. Therefore the study established that the company highly benchmarked its supply chain performance measures.Bunney et al., (2009) described benchmarking as one key approach to manage the supply chain in order to minimize costs and satisfy service level agreements hence the high level of benchmarking by the company.

Table 4.4 Level of Supply Chain Benchmarking

Delivery to Customer Measures

	N	Mean	Std. Deviation
Percentage on time delivery with no damage	25	4.3600	.70000
Order fulfillment cycle time in total time	25	4.3200	.80208
Supplier efficiency and reliability	25	3.9600	.61101
Deliveries done within due dates in number	25	3.8800	.78102
Transport lead time in hrs per km	25	3.8400	.62450
Delivery performance levels of transporters	25	3.7200	.93630
Deliveries at acceptable late/early timelines	25	3.6800	.80208
No. of orders fulfilled before due date	25	3.2800	.89069
Valid N (listwise)	25		

Price and Cost Measures

	N	Mean	Std. Deviation
Actual price versus market index	25	4.1600	.74610
Demurrage and detention procuring costs	25	4.1200	.88129
Annual cost of products sold	25	4.1200	.72572
Transport and detention delivery costs	25	4.0800	.75939
Supplier cost of services rendered	25	4.0800	.49329
Actual prices between divisions	25	3.9600	.84063
Cost avoidance	25	3.9200	.70238
Actual price versus planned price	25	3.7600	.92556
Cost changes from change in strategy	25	3.2800	.97980
Valid N (listwise)	25		

Quality and Safety Measures

	N	Mean	Std. Deviation
Compliance to safety requirements	25	4.5600	.50662
Supplier performance on environment &safety	25	4.4400	.58310
Maximum allowable defects	25	4.3200	.55678
Defects from individual supplies	25	4.3200	.74833
Mean time between failures of equipment	25	4.2400	.59722
Warranty claims by customers	25	4.1600	.68799
Transport carrier quality	25	4.0800	.64031
Returned orders by customers	25	3.9200	.57155
Internal customer satisfaction with purchasing	25	3.3200	.85245
Valid N (listwise)	25		

Source: Research data (2011)

4.5. Relationship between Benchmarking and Performance

The second objective was to examine the relationship between supply chain performance and benchmarking. V various measures of performance were used to gauge the level of performance. Similarly, respondents were asked to rate the level of benchmarking on each of the measures. Pearson correlation coefficient (r) was established using the correlation analysis Table 4.5 below shows the study results of the correlation coefficients (r) between various aspects of the study. The table shows that benchmarking has a strong positive relationship with supply chain performance.

With a Pearson correlation coefficient (r) of 0.893, the level of benchmarking the delivery to customer aspects has a very strong positive relationship with the supply chain performance. This also indicates that 79 % (r^2) of the variability in the performance could be due to performance benchmarking, the rest being due to other factors. Price and cost benchmarking also contributes greatly to supply chain performance as indicated by the strong positive relationship with a correlation coefficient (r) of a 0.799.It is also evident that benchmarking the quality and safety measures strongly influences their performance as indicated by a correlation coefficient (r) of 0.798. This is also an indication that 63% (r^2) of the performance variability in quality and safety is a result of benchmarking. Therefore the study established that increase in the level of performance benchmarking leads to an increase in the supply chain performance. A study by Ogolla(2006) indicated that benchmarking led to performance improvement at Barclay bank, this is in congruence with the findings of this study which indicate a positive relationship. Handfield et al., (2009) stated that benchmarking helps identify the best business practice which can lead to direct performance improvement as confirmed by the findings above. Jackson & Lund., (2000) also linked benchmarking with improvement of performance.

Table 4.5 Correlation Between Benchmarking and Supply Chain Performance

Delivery to Customer Measures

		Delivery to customers benchmarking	Delivery to customers perormance
Delivery to customers benchmarking	Pearson Correlation	1	.893**
	Sig. (2-tailed)	.	.003
	N	8	8
Delivery to customers perormance	Pearson Correlation	.893**	1
	Sig. (2-tailed)	.003	.
	N	8	8

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

Price and Cost Measures

		Price and cost benchmarking	Price and cost perormance
Price and cost benchmarking	Pearson Correlation	1	.779*
	Sig. (2-tailed)	.	.013
	N	9	9
Price and cost perormance	Pearson Correlation	.779*	1
	Sig. (2-tailed)	.013	.
	N	9	9

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

Quality and Safety Measures

		Quality and safety benchmarking	Quality and safety performance
Quality and safety benchmarking	Pearson Correlation	1	.798**
	Sig. (2-tailed)	.	.010
	N	9	9
Quality and safety performance	Pearson Correlation	.798**	1
	Sig. (2-tailed)	.010	.
	N	9	9

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

Source: Research data (2011)

4.6 Benefits of Supply Chain Performance Measurement and Benchmarking

Respondents were asked to rate the benefits of supply chain performance measurement and benchmarking. The responses are presented in table 4.6

Table 4.6 Benefits of Performance Measurement and Benchmarking

Source: Research data (2011)

Data analysis was by mean scores with interpretation based on the 1-5 scale of indicating increasing value of the benefit. From the study as indicated above contribution to customer focus is the topmost benefit gained from supply chain performance measurement and benchmarking .It has a mean score of 4.2 and also its low value standard deviation indicating very close rating by all. Topping the list of benefits is also that benchmarking serves as a source of market intelligence with a mean score of 4.08. Contributing to organizational learning is rated third with a mean score of 4. Other benefits identified in order of significance are contributing to motivation, innovation and being a gap analysis tool between the company and the best in class with mean scores of 3.92, 3.92 and 3.84 respectively. A study by Voss et al (1997) identified an indirect link between

benchmarking and performance as it increased understanding on firm's position relative to its competition. Similarly bench marking also helps identify the best business practice in use in the company and broadens the organizations experience base. These benefits have a mean score of 3.8 and 3.72 respectively. All have very low standard deviation of less than 1 hence indicating the closeness of the rating by the respondents.

4.7 Supply Chain Performance Measurement Challenges

This section covers the major challenges associated with supply chain benchmarking and performance measurement which was the third objective of the study. The respondents were asked to rate the challenges facing supply chain performance measurement and benchmarking. Table 4.7 below shows the findings.

Table 4.7 Challenges of Supply Chain Performance Measurement and Benchmarking

Challenges

	N	Mean	Std. Deviation
Management support	25	4.2000	.76376
Disintegrated internal procedures	25	3.8800	.60000
Performance measures being short term and less focused	25	3.8000	.70711
Wrong data for performance evaluation	25	3.7200	.73711
Lack of supply chain management ownership	25	3.6800	.62716
Lack of measures	25	3.6800	.85245
Resistance to change	25	3.6800	.85245
Commitment to necessary data collection requirements .	25	3.6000	.70711
Acceptability throughout the firm	25	3.6000	.64550
Lack of guidelines	25	3.5200	.91833
Performance measures drive behavior that is not needed	25	3.3600	.86023
Too much data in performance evaluation	25	3.3600	.75719
Availability of skilled labor	25	3.2000	.81650
Valid N (listwise)	25		

Source: Research data (2011)

Data analysis was by mean scores with interpretation based on the 1-5 scale of indicating increasing strength of the challenge**.** The biggest challenge as indicated in the above results of the study is management support with a mean score of 4.2. This indicates that it is

considered a big challenge and indeed the biggest challenge. Handfield et al., (2009) described executive management support as one of the critical benchmarking success factors as confirmed by the above findings. The firm must also be willing to commit the necessary requirements to data gathering. The findings also confirm that organization has to be fully committed to continuous improvement in order to succeed (Vaziri, 1992) Disintegrated internal procedures, performance measures being short tem and less focused, wrong data for performance evaluation and lack of supply chain management ownership are the other main challenges identified in the study with mean scores of 3.88, 3.8, 3.72 and 3.68 respectively. These scores indicate that they were highly considered to be strong challenges. Availability of skilled labor is the least of the challenges identified within the company with a mean score of 3.2. All have very low standard deviation of less than 1 indicating that the rates by the respondents had little variance and therefore represented the true rating of the challenges experienced by the company in implementing the concept.

CHAPTER FIVE: SUMMARY CONCLUSION AND RECOMMENDATIONS

5.1 Summary

Supply chain performance is very critical in the oil industry due to the consequences which can result from its poor performance. These include creation of shortage of essential commodities such as fuel and LPG. It can also lead to clogging of the entire fuel supply chain with dire consequences. This therefore creates pressures to improve the supply chain performance based on the various performance measures through various approaches one of which is performance benchmarking This study was aimed at establishing the relationship between supply chain performance and benchmarking , the related challenges and benefits.

5.2 Benchmarking

On the status of the benchmarking the supply chain the study revealed that the company benchmarked its supply chain through three main perspectives of customer responsiveness, price and cost and quality and safety attributes. The level of performance benchmarking is quite high in the company in general. The main areas where highest level of benchmarking was carried out were in the on time delivery with no damage and the order fulfillment cycle time, Price and cost measures leading in benchmarking were the Actual price versus market index, demurrage and detention costs and the annual cost of the products sold. For quality and safety, compliance to safety requirements is accorded the highest importance and hence the highest level of benchmarking. These measures are mainly benchmarked internally through other affiliate companies but also externally with competition. Benchmarking the supply chain performance helps to measure and compare the performance results of the

various supply chain performance measures, identify gaps potential for improvement. Through benchmarking goals are set and practices that identify superior performance are identified.

5.3 Supply Chain Performance

The performance of Total Kenya ltd supply chain as measured in the study indicated good performance in general which can partly be attributed to benchmarking. On time delivery performance measures indicated performance above average and hence within the set goals in the areas of on time delivery with no damage and order fulfillment cycle time. For quality and safety measures, compliance to safety requirements and supplier performance on safety and environment are the best performers. Compliance to safety requirements performance actually is the highest in all measures recording a mean score rating of 4.2.The actual price versus the market index is the best performing among the price and cost measure.

This study revealed a positive relationship between benchmarking and supply chain performance. The level of benchmarking the delivery to customer aspects has a strong positive relationship with the supply chain performance of the same measures with a highly significant correlation. Price and cost benchmarking also contributes greatly to supply chain performance as indicated by the strong positive relationship. It is also evident that benchmarking the quality and safety measures strongly influences their performance as indicated by its strong correlation. Numerous benefits also result from benchmarking as indicated by the study. These include contribution to customer focus, serving as a source of market intelligence and contributing to organizational learning. It also contributes to motivation, innovation and acts as a gap analysis tool between the company and the best in class.

5.4 Challenges of Supply Chain Benchmarking

The study looked at the challenges encountered by Total Kenya Ltd in supply chain performance measurement and benchmarking .The measurement of supply chain has several challenges, key among them lack of management support, disintegrated internal procedures and performance measures being short term and less focused. Others include wrong data for performance measurement, lack of supply chain management ownership and lack of measures.

5.5 Conclusions

Benchmarking the supply chain performance has a positive impact on supply chain performance. Indeed benchmarking the supply chains has a positive relationship with the supply chain performance. Therefore given the challenges faced by the oil industry consistent use of benchmarking for the entire supply chain would result to gaining competitive advantage. There are however some challenges in implementation of this concept, the highest rated one being management support.

5.6 Recommendations

TKL and indeed the entire oil industry need to fully apply the supply chain performance measurement and performance benchmarking concept. They therefore need to develop clear policies on the concept within the entire supply chain. They should benchmark their supply chain performance both within and without the Company and industry since supply chain also covers many companies outside the competition. The companies need to develop performance measurement procedures in order to ensure performance is actually measured and recorded in order to trace improvements and encourage the development of the company. The importance of management support in the success of the supply chain performance cannot be

overemphasized and therefore all managers should fully support the implementation and take ownership of their roles. The performance measures identified as lowly benchmarked should be continuously benchmarked so as to achieve higher performance. The challenges identified can be minimized through increased management support based on appreciation of the benefits established in the study. Other ways to address the challenges is though ensuring the performance measures are long term. In addition management should ensure all measures are cleared defined in well established guidelines. Training is also necessary in order to ensure necessary skills are acquired and also address resistance to change

5.7 Limitations of the study

In several cases the respondents received the questionnaire by mail and mailed back the answers the same way. There was therefore lack of an opportunity to clarify any issues with the researcher in cases where due to pressure from work the respondents had no adequate time for the same. Some respondents also did not respond to the questionnaire citing fear of bridging the company policy of sharing information while others cited too much pressure from work. Lack of understanding of the subject could also have caused failure to respond for those unwilling to seek clarifications.

5.8 Suggestions for further research

The study focuses on the supply chain within the oil industry. Further research can therefore be done outside the oil industry especially in industries within the service sector with supply chains for moving consumer goods or in the manufacturing sector. This would enable the use of additional attributes of supply chain performance not applicable in the oil sector.

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APPENDICES

APPENDIX I: LETTER OF INTRODUCTION

Dear sir /Madam

RE: MBA RESEARCH PROJECT.

I am a student at the university of Nairobi pursuing a master of business Administration degree .I am currently conducting a research project on supply chain performance measurement and benchmarking as part of the degree requirements.

Your firm has been selected for this study and therefore I kindly request you to spare some time and complete the attached questionnaire. All the information you volunteer will be treated in strict confidence and will not be used for any other purpose other than the intended academic use. The findings of the study can however be availed to you upon its completion

Thanks for your cooperation

Sincerely yours

Mwake kioko

APPENDIX II: QUESTIONNARE

Part A. Respondents Background Information

Kindly fill in the following.

1. Respondents job Title……..

2. Department……

3. Section……

Part B. Supply Chain Performance:

Kindly Mark (X) appropriately to indicate your assessment of the performance of your company on each of the indicated performance measures towards meeting its set standards (benchmarks).

Item	Supply chain performance measure	Far below set standard	Below Average	Average performance	Above average	Fully Meets standard
	Delivery to customer measures					
1	Percentage of on time delivery with no damage					
2	Total time from order to delivery (order fulfillment cycle time)					
3	Deliveries done within due dates for deliveries					
4	Deliveries done within acceptable late/ early arrivals to due dates					
5	Number of orders fulfilled before customer request date					
6	Delivery performance levels of transporters					
7	Transport lead-time measures to customer per km					
8	Supplier efficiency and reliability towards orders					
	Price and cost measures					

1	Supplier cost of services rendered					
2	Cost changes from change in strategy					
3	Costs avoided due to less cost paid(cost avoidance)					
4	Annual cost of products sold to customers.					
5	Actual price versus planned price of expenditures					
6	Comparison of actual prices between divisions					
7	Actual price verses market index of expenditures					
8	Demurrage and detention costs at procuring product					
9	Transport and detention costs delivering product					
	Quality measures					
1	Number of defects from individual supplies					
2	Maximum number of allowable defects					
3	Mean time between failures of equipment					
4	Compliance to safety requirements					
5	Transport carrier quality of tankers					
6	Returned orders by customers					
7	No of Warranty claims or compensation claims					
8	Internal customer satisfaction with purchasing					
9	Supplier performance on environment and safety					

Part C. Supply Chain Performance Benchmarking and Benefits

C1: Benchmarking.

Kindly Mark (X) appropriately to indicate level of importance placed on applying others superior standards (benchmarking) by your company on the following aspects of performance of its supply chain.

Item	Performance benchmark aspect	N/A	Not important	Somehow important	Important	Very important
	Delivery to customer Aspects					
1	Percentage of on time delivery with no damage					
2	Total time from order to delivery (order fulfillment cycle time)					
3	Deliveries done within due dates for deliveries					
4	Deliveries done within acceptable late/ early arrivals to due dates					
5	Number of orders fulfilled before customer request date					
6	Delivery performance levels of transporters					
7	Transport lead-time measures to customer per km					
8	Percentage of on time delivery with no damage					
9	Supplier efficiency and reliability towards orders					
	Price and cost Aspects					
1	Supplier cost of services rendered					
2	Cost changes from change in strategy					
3	Costs avoided due to less cost paid(cost avoidance)					
4	Annual cost of products sold to customers.					
5	Actual price versus planned price of expenditures					
6	Comparison of actual prices between divisions					

7	Actual price verses market index of expenditures					
8	Demurrage and detention costs at procuring product					
9	Transport and detention costs delivering product					
	Quality Aspects					
1	Number of defects from individual supplies					
2	Maximum number of allowable defects					
3	Mean time between failures of equipment					
4	Compliance to safety requirements					
5	Transport carrier quality of tankers					
6	Returned orders by customers					
7	No of Warranty claims or compensation claims					
8	Internal customer satisfaction with purchasing					
9	Supplier performance on environment and safety					

C2: Benchmarking Benefits

Kindly mark(X) appropriately to indicate your assessment of the listed benefits the company can derive from implementation of supply chain performance measurement and performance benchmarking on a scale of 1 to 5 representing extend of benefit

Item	Benefits from performance measurement and benchmarking	N/A	Disagree	Somehow agree	Agree	Strongly agree
1	A stimulus for achieving change initiatives					
2	Broadens the organizations experience base					
3	Independent assessment of a process					
4	Contributes to customer focus					
5	Contributes to innovation					
6	Contributes to organization learning					
7	Contributes to motivation					
8	A gap analysis tool between the company and the best in class					
9	Promotes evolution of a learning culture					
10	Helps identify best business practice to use in company plans					
12	Breaks the reluctance to change					
13	Serves as source of market intelligence					
14	Valuable professional contracts received					

Part D: Challenges.

Kindly mark (X) appropriately to indicate your assessment of the extent to which the listed challenges impact on the ability in implementing supply chain performance measurement and performance benchmarking on a scale of 1 to 5 representing extend of challenge.

Item	Challenges of performance measurement and benchmarking	N/A	Disagree	Somehow agree	Agree	Strongly agree
1	Acceptability through out the firm					
2	Management support					
3	Commitment to necessary requirements for data gathering					
4	Resistance to change					
5	Too much data in performance evaluation					
6	Wrong data for performance evaluation					
7	Performance measures being short term and less focused					
8	Performance measures drive behavior that is not needed					
9	Disintegrated internal procedures					
10	Lack of guidelines					
11	Lack of measures					
12	Lack of supply chain management ownership					
13	Availability of skilled labor					

C2: Benchmarking Benefits

Kindly tick(√) appropriately to indicate your assessment of the listed benefits the company can derive from implementation of supply chain performance measurement and performance benchmarking on a scale of 1 to 5 representing not applicable , agree, disagree, strongly agree and strongly disagree respectively.

Item	Benefits from performance measurement and benchmarking	N/A	Disagree	Somehow agree	Agree	Strongly agree
1	A stimulus for achieving change initiatives					
2	Broadens the organizations experience base					
3	Independent assessment of a process					
4	Contributes to customer focus					
5	Contributes to innovation					
6	Contributes to organization learning					
7	Contributes to motivation					
8	A gap analysis tool between the company and the best in class					
9	Promotes evolution of a learning culture					
10	Helps identify best business practice to use in company plans					
12	Breaks the reluctance to change					
13	Serves as source of market intelligence					
14	Valuable professional contracts received					

Part D: Challenges.

Kindly tick(√) appropriately to indicate your assessment of the extent to which the listed challenges impact on the ability in implementing supply chain performance measurement and performance benchmarking on a scale of 1 to 5 representing not applicable , agree, disagree, strongly agree and strongly disagree respectively

Item	Challenges of performance measurement and benchmarking	N/A	Disagree	Somehow agree	Agree	Strongly agree
1	Acceptability through out the firm					
2	Management support					
3	Commitment to necessary requirements for data gathering					
4	Resistance to change					
5	Too much data in performance evaluation					
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11	Lack of measures					
12	Lack of supply chain management ownership					
13	Availability of skilled labor					