APPLICATIO OF VALUE CHAIN IN DEVELOPING COMPETITIVE ADVANTAGE AT KENYA PETROLEUM REFINERIES LIMITED (KPRL)

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A Management Research Project Submitted in Partial Fulfillment of the Requirements for the Award of the Degree of Masters of Business Administration, School of Business, University of Nairobi.

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DECLARATION

This is my original work and has not been submitted for a degree in any other University.

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This project has been submitted for examination with my approval as University Supervisor.

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DEDICATION

This study is particularly dedicated to my wife Caroline and our children Richard, Steven and Brian, without whose support, this project would not have been complete.
ACKNOWLEDGEMENT

A study of this nature is usually a product of various efforts. My thanks go to my supervisor, Jackson Maalu for his invaluable support, advice and keenness to detail. I would like to acknowledge the support and encouragement of various lecturers, classmates, KPRL management and colleagues.
A successful business strategy requires the development and maintenance of some form of sustainable relative competitive advantage in addition to internal facts and figures. External information is also necessary for a decision maker to gain up-to-date knowledge of the market conditions, competition and customer expectations. To analyze the specific activities through which firms can create a competitive advantage, it is useful to model the firm as a chain of value creating activities. The Value Chain is a tool for diagnosing competitive advantage and finding ways to enhance it, (Porter, 1985). The value chain framework is an approach for breaking down the sequence of business functions into strategically relevant activities through which utility is added to products and services.

The case study sought to determine the application of value chain in developing competitive advantage in KPRL. The study examined how KPRL has broken down the sequence of its business functions into strategically relevant activities through which utility is added to products and services. This was done in order to understand the behavior of costs and the sources of differentiation. The findings of the study indicate that KPRL has in place systems, processes and structures that support value chain both at primary and support levels. Although there are activities that create value in KPRL, operations and technology related activities stand out as the ones through which significant value is either lost or not created. As a result of technological limitations associated with the refinery configuration some key activities have not delivered the much needed competitive advantage mainly due to high residual oil, excessive fuel usage and loss. This in itself is a threat to the future of the refinery due to competition from modern and complex refineries in the Middle East. Consequently the refinery technology requires urgent upgrading.
Issues of quality of products and services are important, however, it is not much the customer perception that drives competition and therefore the appeal to differentiation is not very strong in KPRL. The refinery does not directly serve the final consumers and petroleum products by their physical characteristics are homogeneous global commodities. Refinery customers are largely attracted to sources that provide better margins which come from complex refineries. It is the margins that drive the pump prices at retail level. Therefore cost focus is more relevant compared to differentiation as a tool of strategy in creating competitive advantage at KPRL.

The overall economics or value addition of the refinery depends on the interaction of three key elements: the choice of crude oil used, the complexity of the refining equipment and the desired type and quality of products produced. To survive in today's highly competitive business environment an organization has to achieve at least temporary a competitive advantage. At KPRL a low cost strategy focusing on providing goods and services at a lower cost than imports or superior goods or services at an equal cost should be pursued. Merchant refining at KPRL should be considered post the proposed refinery upgrade to ensure backward integration to crude and products trading to enhance benefits within a wider value chain. These will enhance value creation through cost reduction for greater margin realization.
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CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

A business environment is comprised of firms and various factors that influence competition within an industry. Firms are environment dependent as they obtain their inputs such as capital, raw materials, and human resources from it and discharge their outputs in form of products and services to it (Cole. G.A, 2004). As firms engage in their activities to discharge their mandate, within a business environment, they compete with other firms engaged in similar or substitute activities. In order for firms to survive competition they need to gain competitive advantage.

Sustainable competitive advantage is a very significant contributor to superior profitability. There are many routes to competitive advantage e.g. low costs, delivering superior customer service, convenient geographic location, technological expertise, better supply chain management, and better production techniques. The basis of superior performance in the long run is sustainable competitive advantage. Michael Porter (1980, 1985 and 1998) identified two basic types of competitive advantage i.e. cost advantage and differentiation advantage. To analyze the specific activities through which firms can create a competitive advantage, it is useful to model the firm as a chain of value creating activities.

1.1.1 The Value Chain

The value chain for any firm in any business is the linked set of value creating activities all the way from basic raw material sources for component supplies through to the ultimate end-use product delivered to the customer (Johnson and Scholes, 2000). A company is therefore a chain of activities for transforming inputs into outputs that customer's value. According to Porter (1990), competitive advantage arises out of the way in which firms organize and perform these activities. By breaking up a company into its various value activities, we are able to understand
the behavior of costs and the existing and potential sources of differentiation. A company’s value chain interacts with value chains of other companies i.e. supplier value chains, channel value chains, buyer value chains. These other value chains influence the company’s value chain. Consequently the Value Chain is a tool for diagnosing competitive advantage and finding ways to enhance it.

Value chain was a concept initially proposed by McKinsey (the management consultants) and later developed and made public by Harvard strategy guru Michael Porter. The value chain, also known as value chain analysis, is a concept from business management that was first described and popularized by Michael Porter in his 1985 best-seller, *Competitive Advantage: Creating and Sustaining Superior Performance*. Value chain was developed as a tool of strategy. Porter highlighted the place of competitive advantage in the economic chain and idea of synergies across different businesses (economies of scope). Value chain categorizes the generic value-adding activities of an organization, (Johnson Scholes & Whittington, 2005). The "primary activities" include: inbound logistics, operations (production), outbound logistics, marketing and sales (demand), and services (maintenance). The "support activities" include: administrative infrastructure management, human resource management, information technology, and procurement. The costs and value drivers are identified for each value activity. The value chain framework has quickly made its way to the forefront of management thought as a powerful analysis tool for strategic planning. Its ultimate goal is to maximize value creation while minimizing costs.

### 1.1.2 Oil Industry in Kenya

Oil marketing companies have been around for more than 100 years with Shell reported to have been in Kenya since 1900 when they began their operations in Mombasa and Zanzibar. The operation started with illuminating kerosene as the only product being sold in bulk. At this point,
petrol was being imported in drums then decanted into tins for distribution. Prior to this, Smith Mackenzie and Co. Ltd had been acting agents for Shell while Gibson & Co. did the same for BP. In 1928, the consolidated Petroleum Company was formed to handle joint operations and products of Shell and BP in several countries in Asia and Africa, (Kenya Shell, 2008). There are now more than thirty marketing oil companies (See appendix III) operating in Kenya, however, it's only six of them that dominate the market. They include Shell, Chevron, Total, Oilibya, Kenol and Kobil. These companies, which have a national presence, control more than 80% of the market share. The balance of the players in the industry are comprised of the National Oil Company of Kenya (state owned) and newly formed small indigenous companies which operate in selective regions in the country. Kenya imports petroleum chiefly from the Persian Gulf area, most of it as crude oil, with refined products (mainly from the Mediterranean market), (Isaboke, 2001).

The oil industry has three levels: upstream, midstream, and downstream levels which encompass the main segments in the supply chain. The upstream levels include the exploration, drilling, and production of crude oil and the midstream level includes the transportation and trading of crude oil to refineries. The downstream level refers to the refining of crude oil into finished products, the storage of crude oil, and the distribution and marketing of finished products to wholesalers and retailers. The oil industry in Kenyan is basically the downstream segment since attempts in upstream activities of exploration and production have not been successful this far. There are three major distinct players in the petroleum industry in Kenya. These are Kenya Petroleum Refineries Limited (KPRL) - Refining business, Kenya Pipeline Company (KPC) - transportation / distribution and oil marketers - marketing (Wholesale and retail). The Government has been playing a supervisory and regulatory role through the Ministry of Energy.
Through a press release by Ministry of Energy dated 27th October 1994, the Government of Kenya liberalized the petroleum industry, allowing marketers of petroleum products to import their finished petroleum product requirements directly. Due to various limitations at KPRL, the imported products proved to be cheaper than locally refined products. To protect the refinery, the Government directed that all oil marketers refine some of their petroleum product requirements at the refinery. The agreed minimum throughput to be refined was 1.6 million metric tonnes of crude petroleum which is underpinned by law through a legal notice. This amount was based on the crude oil that was necessary to generate about 33,000 metric tonnes of LPG, which was adequate to satisfy the country’s LPG requirements at the time. The volume was also aimed at ensuring that the refinery did not overproduce fuel oil. The volume is commonly known as the base load. The base load is also designed to enable the refinery recover its fixed and variable costs, with a marginal contribution for capital expenditure to sustain the refinery operations. The oil marketers are free to import any petroleum requirements that are not met from the refinery production.

There are various challenges facing the industry as a whole that include adverse economic factors, stringent environmental standards, increased regulation and stiff competition. There are now stringent environmental standards to be met by the industry especially on clean fuels and quality of emissions to air. In recent years, governments and industry have directed considerable effort towards reducing the environmental impact of burning fossil fuels. The new Energy Act, 2007, seeks to harmonize the various legislations governing the energy sector in Kenya, with the aim of establishing a common policy background for all the players in the industry. The Energy Act has established an Energy Regulatory Commission (ERC) that will regulate the importation, exportation, transportation, refining, storage and sale of petroleum products. The ERC will also be charged with the responsibility to ensuring the implementation and observance of the principles of fair competition within the industry. Importantly, the ERC will take over the
oversight role that is currently under the Ministry of Energy. Competition from new small entrants with low overhead costs has been of great concern especially to the multinational oil companies.

The oil industry landscape in Kenya is dynamic with rapid withdrawals and entry by smaller local operators. Recently, British Petroleum (BP) withdrew its retailing operations in Kenya while Mobil has sold its local interests to Oil Libya Kenya Ltd. Reliance Industries Ltd of India has acquired a controlling interest in Gapco, a regional operator with presence in Kenya, Uganda and Tanzania. Overall the downstream petroleum sector is quite complex and highly competitive.

1.1.3 Kenya Petroleum Refineries Limited (KPRL)

KPRL history can be traced back to an agreement between the colonial government and "Consolidated" (50% Shell and 50% BP) of 1959. Subsequently on 30 March 1960, East Africa Oil Refineries Limited was incorporated in Kenya under the Companies Act. In 1983, it changed its name to Kenya Petroleum Refineries limited. The company owns and operates the refinery whose shareholders are Kenya Government 50%, Beyond Petroleum Company plc 17.1%, The Shell Petroleum Company Ltd 17.1% and Chevron Texaco 15.8%. The Kenya Government was not among the founder shareholders in 1960, but bought its shareholding in 1971. KPRL is located at Refinery road, in Changamwe area of Mombasa, Kenya. It is the only refinery of substantial capacity in the eastern coast of Africa. The refinery has two processing units, namely complex 1 and Complex 11. The first complex was build and commissioned in 1963 while the second complex was commissioned in 1974.

The company’s principal activity is refining crude oil into petroleum products for oil marketing companies. It is a tolling refinery whose business model is based on refining crude for a fee. The
refinery does not own the crude and the products that are derived from the processing activities as they belong to its customers who are petroleum companies operating in Kenya. KPRL serves more than 30 companies operating in Kenyan oil and gas Market. The refinery provides its services within a contractual framework of a processing agreement signed with each marketing company. The crude oil imported into Kenya for processing at KPRL is sourced through a competitive Open Tender System (OTS). The OTS provides the oil industry players with a platform to import crude oil in large commercially viable quantities. Under the OTS, interested marketers bid to import cargoes of crude oil on behalf of the other marketers. The tender for the supply of crude oil is open to all petroleum companies that are licensed by the Ministry of Energy and have signed petroleum processing agreements with KPRL. The winner of the tender imports the crude on behalf of the other Marketers in nominal cargo carrier of 80,000 tones. The Ships berth at Kipevu Oil Jetty, which is owned by Kenya Ports Authority (KPA). The Ship discharges into KPRL crude tanks at the port. The amount discharged is then quantified on account of the importer and custody is transferred from importer to KPRL for processing.

A typical refinery value chain will include, crude oil receipt and storage (jetty, pipelines, pumps, tanks, measurement), separation of crude into components (distillation / separation of components having different boiling points), treating & conversion (hydrotreating – removing sulphur and platforming to increase octane number), blending, testing and storage of products (tanks, mixers, pipelines, pumps laboratory), transfer to marketing companies (measurement, tanks, pumps, pipelines), finance & personnel (accounting, human resource management), materials and services procurements (procurement of spare, additives, services & contractors), fire & safety advisory services (safety advisors, fire stations, fire fighting crew), operations (24 hour shift, process & oil movements, scheduling, oil accounting), engineering services (mechanical, electrical, instrumentation, inspection, reliability), technical support (chemical engineers, computing), laboratory (testing).
KPRL business model and the activities described above provide a basis for value chain analysis. KPRL is a chain of activities for transforming inputs (Crude) into outputs (processed products) that customer’s value. This process comprises both primary and secondary or support activities. KPRL value chain interacts with value chains of other companies. KPRL does receive crude which it must add value through processing or transformation into finished products. The refinery process produces a number of white oils which are Liquefied Petroleum Gas (LPG), Premium Motor Oil (PMS), Regular Motor Oil Spirit (RMS), Dual Purpose Kerosene (DPK) Automotive Gas Oil (AGO) and black oils which are Fuel Oil (FO) and Bitumen. The white oils are more valuable as they generate higher margins. The finished products are stored within the refinery and later transferred to customers through various storage and pipeline networks. In the refinery, all products produced except bitumen are transferred to the customers through pipelines. The pipelines are connected to various customers’ terminals and Kenya Pipeline Company pump station number one in Mombasa. The Company has also both Bitumen and Fuel Oil loading facilities. Other refinery services include, Laboratory Services, Grease Manufacturing, Products Storage, Transfer and Loading Facilities.

There are challenges facing KPRL that affects the company’s competitive advantage. The challenges are mainly due to both internal factors i.e. operational constraints, the nature of technology and infrastructure in use and external factors which relate to wider environmental issues including existing legal and regulatory framework. From a strategic point of view, the key challenge facing KPRL is one of competitiveness mainly due to Technological reasons. KPRL is also facing competition from modern refineries especially in Middle East whose products importation to Kenyan market are at relatively lower cost. Consequently KPRL is viewed as being uncompetitive relative to imported products leading to capacity underutilization. KPRL is operating in an industry that is heavily regulated in so far as environment is concerned. Kenya
Bureau of Statistics (KEBS) has established specification for unleaded gasoline and low sulphur diesel. Since the Refinery still produces and markets its gas oil at 1.0% Sulphur on quality waiver, there is a continuous threat on the existence of the business until such time as the Refinery can meet the product quality requirements. There are already initiatives by industry players to have the importation of AGO at 0.05% sulphur level.

As part of refinery economics, every refinery user tries to optimize yields from crude oil processed for maximum value. A supply analyst prepares a refining program for the best crude yields combination to best meet the supply and demand pattern for that company. A marketer who does not have a demand mix comparable to the yields from crude oil will always have a mismatch of products, occasionally with surplus products for which he has no market or taker. This can prove expensive in inventory financing and profit realization, (Petroleum Insight Correspondent, 2006).

1.2 Statement of Research Problem

The Value Chain is a tool for diagnosing competitive advantage and finding ways to enhance it, (Porter, 1985). The study is based on the concept of value chain which embeds competitive advantage through various value adding activities performed within a business. The value chain for any firm in any business is the linked set of value creating activities all the way from basic raw material sources for component supplies through to the ultimate end-use product delivered to the customer (Johnson and Scholes, 2000). The value chain disaggregates a firm into its strategically relevant activities in order to understand the behavior of the firms’ costs and its existing or potential sources of differentiation. KPRL major concern relate to production (operations) in terms of efficiency, product deliveries and services to its customers in terms of quantity, quality, timing and communication to customers. Customers according to Abrahamsen and Williams (2005), choose on the basis of certain criteria that would enable them discriminate
one firm from another. Product and service differentiation according to Kotler (2000) is a major way in which firms can improve their competitiveness in a crowded market place as they can draw customers towards their offers. Consequently marketing companies can discriminate from the refinery in favour of importing finished products.

Related studies have been conducted about value chain management by organizations in Kenya. Among the recent studies done are Musau (2003), and Mwangi (2003) both of which are surveys. Odero (2006) carried out a study on value chain and competitive advantage in the corporate banking industry in Kenya; a case study of Citibank Kenya. Despite the studies that have been done to establish value chain activities and competitive advantage, there is no case study done on KPRL value chain. Findings from related studies may not be generalized to fairly represent the oil industry and in particular refining business which has not been studied. Refining business is capital / technology intensive with significant competition from imported refined products. Overall the downstream petroleum sector is quite complex and highly competitive.

Introduction of the Study

As a firm KPRL has to deal with issues relating to crude receipt logistics, operational efficiency, product transfers which must be at the right quantity and specification, timely deliveries, state of infrastructure, availability of competent and skilled workforce, technology development and procurement issues. The activities of KPRL do influence the overall product costs in the market place which has both imported and locally processed products. It has been argued that due to the state of technology, products from KPRL are more expensive than imported finished products that have been processed from modern and efficient refineries in the Middle East. Importing finished products normally commands an edge over sourcing products from the local refinery, and this may remain so until investment in thermal cracker occurs, (Munupe, 2007).
KPRL is a significant player in the oil industry value chain in Kenya. The fact that marketing companies source 50% of their requirements from KPRL makes the refinery value chain more important for purposes of study. The costs of products ex KPRL do influence final consumer prices in the market. Given the critical role played by KPRL in petroleum supply chain in Kenya and the desire to remain competitive, there is need to critically review value adding processes by examining the application of value chain activities in order to eliminate unwanted costs for greater margin realization or differentiation for greater refinery customer choice. There is need to understand the application of key value chain activities in KPRL and how those activities can be capitalized to reduce costs proactively across the board or create product differentiation for greater choice and value proposition for ultimate competitive advantage.

The proposed study therefore seeks to fill the gap by providing answers to the research question.

What are the value chain activities through which KPRL develops its competitive advantage?

1.3 Objective of the Study

To determine the application of value chain activities in developing competitive advantage in KPRL.

1.4 Importance of the Study

The study will help the management of KPRL in its strategic management processes. It will assist the management in appraising key activities and how they create a competitive advantage to the organization and in effect optimize cost of activities against benefit to customers.

The study will also help KPRL customers evaluate the option of processing with the refinery or direct importation of processed or refined products.
The study will help the Government in particular the Ministry of Energy and other regulatory bodies in formulating Energy and environmental policies.

The study will also contribute to the existing literature and body of knowledge on value chain and competitive advantage and therefore used for further research studies.
CHAPTER TWO: LITERATURE REVIEW

2.1 The Concept of Value Chain

Value chain was developed in the mid 1980s as a tool of strategy. The Value Chain is a tool for diagnosing competitive advantage and finding ways to enhance it (Porter, 1985). A value chain is a chain of activities. Products pass through all activities of the value chain in order and at each activity the product gains some value. The chain of activities gives the products more added value than the sum of added values of all activities. According to Porter (1990), competitive advantage arises out of the way in which firms organize and perform these activities. Developing a sustainable competitive advantage requires an understanding of the company's value chain as well as the chains of those companies it interacts with. Value chains of companies in an industry differ due to various reasons which include past history, strategies etc. The difference in value chain therefore does explain why performance of companies in the same industry differs.

The value chain concept has been extended beyond individual organizations. It can apply to whole supply chains and distribution networks. The delivery of a mix of products and services to the end customer will mobilize different economic factors, each managing its own value chain. The industry wide synchronized interactions of those local value chains create an extended value chain, sometimes global in extent. Porter (1990) terms this larger interconnected system of value chains the "value system." A value system includes the value chains of a firm's supplier (and their suppliers all the way back), the firm itself, the firm distribution channels, and the firm's buyers (and presumably extended to the buyers of their products, and so on). The value chain framework has quickly made its way to the forefront of management thought as a powerful analysis tool for strategic planning. Its ultimate goal is to maximize value creation while
minimizing costs. According to Porter (1985), identifying value activities requires the isolation of activities that are technologically and strategically distinct.

2.2 Value Chain Activities

There have been several contributions on the concept of value chain. The value adding activities in the organization have been divided into two; (i) Primary activities and (ii) support activities (Exhibit 1). (Johnson and Scholes, 1997; Hill and Jones, 2001; Porter, 1985). The value chain categorizes the generic value-adding activities of an organization. The "primary activities" include: inbound logistics, operations (production), outbound logistics, marketing and sales (demand), and services (maintenance). The "support activities" include: administrative infrastructure management, human resource management, information technology, and procurement. The costs and value drivers are identified for each value activity. Value activities and accounting classifications are rarely the same. Accounting classification (e.g. burden, overhead, direct labour) group together activities with disparate technologies and separate cost that are all part of the same activity.

Exhibit 1: The Value Chain within an Organisation

2.2.1 Primary Activities

There are five generic categories of primary activities involved in competing in any industry as shown in Exhibit 1; each category is divisible into a number of distinct activities that depend on the particular industry and firm strategy. Primary activities are directly concerned with the creation or delivery of products or service, (Johnson, Scholes & Whittington, 2005). According to Pearce & Robinson (2005), primary activities (sometimes called line functions) are those involved in the physical creation of the product, marketing and transfer to the buyer, and after sales support. There is general agreement on the composition of primary activities as inbound logistics, operations, outbound logistics, marketing and sales, and service.

Inbound Logistics are activities associated with receiving, storing and disseminating/distributing inputs to the product or service such as material handling, warehousing, inventory control, vehicle scheduling, and returns to suppliers. In refining business these includes crude oil material receipt and handling, storage in the tank farm, line sampling and packing, pump-overs through the pipeline among others. With regard to inbound logistics low cost is a fundamental basis for competitive advantage. According to Mintzberg and Quinn (1991) cost analysis is important in asset acquisition to rationalize the product mix and price correctly.

Operations are activities associated with transforming of inputs into final products form, such as machining, packaging, assembly, equipment maintenance, testing, printing and facility operations. In a refinery this will include processing of crude oil into final product through the distillation columns and platformers activities, product quality testing in the lab to confirm specifications among others. Hofer (1986) concluded that for optimal success of an organization there is need for both a strong operating and strategic position.
Outbound Logistics involve collecting, storage and physical distribution of products to customers such as finished goods warehousing, materials handling, delivery vehicle operation, order processing, and scheduling. Activities in refining will include line batchting and transfer of finished products to customer terminals and depots including transfers to ships for export purposes.

Marketing and Sales involves the organization preparing its goods or services to meet the needs of the targeted customers. It involves providing a means by which buyers can be made aware to purchase the product and inducing them to do so, such as advertising, promotion, sales force, quoting, channel selection, channel relations and pricing. The firms' customer focus or orientation will be reviewed.

Services enhance or maintain the value of a product such as installation, repair, training, part supply, and product adjustment. In the refinery it will include asset management and maintenance, product blending and training of operators.

Each of the categories may be vital to competitive advantage depending on the industry.

2.2.2 Support Activities

Support activities can be divided into four generic categories as shown in exhibit 1. As with primary activities, each category of support activities is divisible into a number of distinct value activities that are specific to a given industry. In technology development, for example discrete activities may include component design, feature design, field testing, process engineering, and technology selection. Support activities help to improve the effectives or efficiency of primary activities, (Johnson Scholes & Whittington, 2005). Support activities (sometimes called staff or
overhead functions) assist the firm as whole by providing infrastructure or inputs that allow the primary activities to take place on an ongoing basis, (Pearce & Robinson, 2005).

Procurement is responsible for all purchasing of goods, services and materials. Procurement refers to the function of purchasing inputs used in the firms' value chain, not to the purchased inputs themselves. Purchased inputs include raw materials, supplies and other consumable items as well as assets such as machinery, laboratory equipment, office equipment and buildings. Procurement tends to be spread throughout a firm. The cost of procurement activities themselves usually represent a small if not insignificant portion of total cost, but often has a large impact on the firms overall cost and differentiation. Johnson and Scholes (2002) affirm that procurement bodies being part of the wider value system do underpin excellence in creating best value in products.

Technological Development activities do possess technology even if it is just mere know-how. It is concerned with product Research and Development (R&D), product design or process development (hydroskimming versus semi complex refineries). Technology development will describe innovative capacity of the company. Key technologies are mainly specific to a product, process or particular resource and this is fundamental to the innovative capacity of the organization, (Johnson, Scholes & Whittington, 2005). Technology development also takes many forms from basic research and product design to media research, process equipment design, and servicing procedures. Technology development that is related to the product and its features supports the entire chain, while other technology development is associated with particular primary or support activities.

Human Resources Management activities of an organization will involve the management of the recruiting, training and development, rewarding and retention of staff. Human resource
formulate the organization character which entrenches the perspective influencing the way an organization develops new ideas, considers and weighs options, and respond to changes in its environment. Human Resource management supports both individual primary and support activities (e.g., hiring of engineers) and the entire value chain (e.g. labour negotiations). Human Resource management affects competitive advantage in any firm through its role in determining the skills and motivation of employees and the cost of hiring and training. In some industries it holds the key to competitive advantage.

Firm Infrastructure involves the systems of planning, finance, quality control and information management in an organization's performance of its primary activities. Firm's infrastructure consists of a number of activities including general management, planning, finance, accounting, legal, government affairs, and quality management. Infrastructure unlike other support activities usually supports the entire chain and not individual activities. Many infrastructure activities occur at both the business unit and corporate levels. Firm infrastructure is sometimes viewed only as “overhead” but can be a powerful source of competitive advantage.

Some differences have been noted in value chain contributions by different authors. Hill and Jones (2001) reckon that the R & D is part of the primary activities while Johnson and Scholes (1997) think that it is a support activity. However, they all seem to agree that it is an important activity of the value creation process analysis. To add value the process is made efficient by avoiding wastage. Value adding in KPRL would be through both lower cost and differentiation. The value chain includes a profit margin since a markup above the cost of providing a firm’s value-adding activities is normally part of the price paid by the buyer- creating value that exceeds cost so as to generate a return for the effort, (Pearce & Robinson, 2005).
2.2.3 Value Chain Analysis

In order to be better understood the activities leading to a competitive advantage; one can begin with the generic value chain and then identify the relevant firm-specific activities. Process flows can be mapped, and these flows used to isolate the individual value-creating activities. According to Pearce & Robinson (2005), Value Chain Analysis (VCA) attempts to understand how a business creates customer value by examining the contributions of different activities within the business to that value. VCA takes a process point of view: It divides (sometimes called disaggregates) the business into sets of activities that occur within the business, starting with the inputs a firm receives and finishing with the firm's products (or services) and after sales service to customer.

Pearce & Robinson (2005) identified some steps to be taken in order to conduct a value chain analysis. The analysis includes, identifying activities, allocating costs, identifying the activities that differentiate the firm, examining the value chain and evaluating value chain activities as strength or weakness. Value chain provides a useful approach to guide a systematic internal analysis of the firm's existing or potential strengths and weaknesses. By systematically disaggregating a firm into its distinct value activities a strategist identifies key internal factors for further examination as potential sources of competitive advantage.

2.2.4 Value Systems and Networks

Various authors have used terms Value System and Value Network to describe the interrelationship between value activities of upstream suppliers and downstream buyers. The firm's value chain links to the value chains of upstream suppliers and downstream buyers. The result is a larger stream of activities known as the Value System or Value Network. According to Johnson, Scholes & Whittington (2005), the Value Network is the set of inter-organizational links and relationships that are necessary to create a product or service. In most industries it is
rare for a single organization to undertake in-house all of the value activities from the product design through the delivery of the final product or service to the final consumer. Similarly, Porter (1990) terms this larger interconnected system of value chains the "value system." A value system includes the value chains of a firm's supplier (and their suppliers all the way back), the firm itself, the firm distribution channels, and the firm's buyers (and presumably extended to the buyers of their products, and so on).

The development of a competitive advantage depends not only on the firm-specific value chain, but on the value system of the industry which the firm is a part.

Exhibit 2: The Value Network

Capturing the value generated along the chain is the new approach taken by many management strategists. For example, a manufacturer might require its parts suppliers to be located nearby its assembly plant to minimize the cost of transportation. By exploiting the upstream and downstream information flowing along the value chain, the firms may try to bypass the intermediaries creating new business models, or in other ways create improvements in its value system. According to Johnson and Scholes (2002), a good product could result from how a set of linked activities are performed from design, component manufacture, assembly process core and speed of distribution, storage, installation and after sales services. In most industries it is rare for a single organisation to undertake in house all of the value activities from the product design through to the delivery of the final product or service to the final consumer. There is always specialisation of roles and any one organisation is part of the wider value system.

2.3 Competitive Advantage

According to Porter (1990), competitive advantage arises out of the way in which firms organize and perform value chain activities. Hill and Jones (2000), states that competitive advantage is the ability of a company to out perform competition within the same industry. Competitive Advantage is an edge over rivals in attracting customers and defending against competitive forces. It is achieved through superior profits in the industry and maintaining them i.e. sustainable competitive advantage. To succeed in building competitive advantage, a company must aim at providing buyers with what they perceive as superior value through prices lower than competitors’ do for equivalent benefits and provision of unique benefits that more than offset premium price. Competitive advantage can also be defined as an advantage over competitors gained by offering consumers greater value, either by means of lower prices or by providing greater benefits and service that justifies higher prices (Johnson and Scholes, 2002).
Porter (1980, 1985 & 1998) provided a framework that models an industry as being influenced by five forces, which are threat of new entrants, threat of substitute products or services, bargaining power of buyers/customers, bargaining power of suppliers and rivalry among existing firms. There are forces which affect the level of competition within an industry hence a strategic business manager can use the technique to develop sustainable strategic edge or advantage over rival firms.

2.3.1 Sustainable Competitive Advantage

A sustainable competitive advantage is one that can be maintained for a significant amount of time even in the presence of competition (Porter, 1985). Sustainable competitive advantage is a very significant contributor to superior profitability. There are many routes to competitive advantage; e.g. low costs, delivering superior customer service, convenient geographic location, technological expertise, better supply chain management, better production techniques, known and respectable brand name etc. Competitive advantage requires that a company does certain activities better than competitors thereby creating superior value for customers.

Porter (1980, 1985 & 1998), identified two basic types of competitive advantage which are cost advantage and differentiation advantage. A competitive advantage exists when the firm is able to deliver the same benefits as competitors but at a lower cost (cost advantage), or deliver benefits that exceed those of competing products (differentiation advantage). Thus, a competitive advantage enables the firm to create superior value for its customers and superior profits for itself. Cost and differentiation advantages are known as positional advantages since they describe the firm’s position in the industry as a leader in either cost or differentiation.
2.3.2 Generic Strategies

Strategic analysis at business level is concerned with identifying and generating strategies that can help the business to develop a solid and sustainable competitive advantage. The strategies can be identified with the help of relevant models depending on the strategic objectives to be achieved. These are strategies expected of every firm any time. Unlike the grand strategies (e.g. integration, collaboration or alliances, diversification, divestment), generic strategies are applicable to all firms without exception.

Michael Porter (1980) suggested four “generic” business strategies that could be adopted in order to gain competitive advantage. The four strategies relate to the extent to which the scope of business activities are narrow versus broad and the extent to which a business seeks to differentiate its products. Porter’s generic strategies model is as shown as shown below, provides a framework for the competitive strategies that are quite fundamental in competition.

Exhibit 4    Porter’s Generic Strategies Model

<table>
<thead>
<tr>
<th>Target Scope</th>
<th>Advantage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low Cost</td>
</tr>
<tr>
<td><strong>Broad (Industry Wide)</strong></td>
<td>Cost Leadership Strategy</td>
</tr>
<tr>
<td><strong>Narrow (Market Segment)</strong></td>
<td>Focus Strategy (Low cost)</td>
</tr>
</tbody>
</table>

Firms or competitors may be identified with each of the four strategies; some could be ‘stuck in the middle’. Each major competitor can be slotted in the relevant quadrant on the basis of its competitive strategy.

2.3.2.1 Strategy – Differentiation

This strategy involves selecting one or more criteria used by buyers in a market and then positioning the business uniquely to meet those criteria. A company differentiates itself if it can be unique at something that is valuable to buyers. Differentiation allows a company to charge a premium price. Differentiation will lead to superior performance if the price premium achieved exceeds the added costs of being unique. Differentiation grows out of the company’s value chain since every value activity is a potential source of uniqueness. Just as cost drivers influence cost, uniqueness drivers influence a company’s uniqueness. Uniqueness drivers are the underlying reasons why an activity is unique. These need to be understood in achieving differentiation.

Porter identified several drivers of differentiation. These include; Policies of organization, linkages among activities, location and integration. Probably the most important uniqueness driver is policy choice. A company has discretion to decide on a number of issues including product features, services provided, location of facilities, personnel to be employed, raw materials to be used etc. A firm can also reconfigure its value chain in several ways to create uniqueness. It can backward integrate to have control over its inputs. It may implement new process technologies or utilize new distribution channels.

For differentiation to be successful the uniqueness has to be seen as valuable by the customer and has to be effectively communicated. A differentiation element that is successful tends to draw imitators. A company that can achieve and sustain differentiation will be above average
performer in its industry if its price premium exceeds the extra cost incurred in being unique (Porter, 1985).

### 2.3.2.2 Strategy – Cost Leadership

The objective of cost leadership strategy is to become the lowest-cost producer in the industry. Cost is an important element in developing competitive advantage and therefore it is important to understand cost behavior. Value chain provides a basis for analyzing costs within a company. Each value activity has its own cost structure. Cost advantage can be obtained if a company achieves a lower cumulative cost of performing value activities than its competitors. To understand the behavior of costs for each activity, the underlying cost drivers have to be identified. Cost drivers are the structural determinants of the cost of an activity. Michael Porter identified some drivers of cost related to value chain activities. These include: economies of scale, capacity utilization, linkages among activities, geographical locations, interrelationships among business units.

A firm can gain cost advantage through either controlling cost drivers i.e. a company achieves lower costs by having better controls than competitors or by reconfiguring the value chain. Here, the company adopts a different and more efficient way to design, produce, distribute or market the product, e.g. automation, use of a new raw material, integration, use of new distribution channels etc. This strategy is usually associated with large-scale businesses offering "standard" products with relatively little differentiation that are perfectly acceptable to the majority of customers. Occasionally, a low-cost leader will also discount its product to maximize sales, particularly if it has a significant cost advantage over the competition and in doing so it can further increase its market share.
To achieve overall cost leadership in an industry, a firm can adopt functional policies and resort to aggressive construction of efficient scale facilities. This can be done through rehabilitation of the plants and machinery and installation of new plants and machinery if necessary to enhance efficiency and cost reduction. Cost leadership can also be achieved through input sourcing from cheaper suppliers and also heavy upfront capital investment in state-of-the-art equipment to reduce cost of customer service delays and minimise the cost of errors. Cost leadership will enable a firm to be able to compete favorably through price cuts especially when dealing with customers who are price sensitive.

2.3.2.3 Strategy – Differentiation Focus

In the differentiation focus strategy, a business aims to differentiate within just one or a smaller number of target market segments. The important issue for any business adopting this strategy is to ensure that customers really do have different needs and wants thus as a justification of the differentiation and that existing competitors' products are not meeting those needs. Porter has argued that a firm can also adopt a strategy of differentiating its product or service offering as a means of trying to create something that is perceived industry-wide as being unique. Product uniqueness can be achieved for example through design and creation of innovative features. The firm can carry massive campaigns emphasizing the product uniqueness, the various models/brands available so as to build a strong brand, identification and greater customer loyalty to defend itself against competitor's products.

2.3.2.4 Strategy – Cost Focus

Under this strategy a business seeks a lower-cost advantage in just a small number of market segments. The product will be basic – perhaps a similar product to the higher-priced and featured market leader, but acceptable to sufficient customers.
2.3.3 Resource-Based Approaches

The emerging critique of positioning during the 1990s led to the development of alternative views. These views form what has become to be known as the resource-based approaches that take a largely inside-out approach to the creation of sustainable competitive advantage which depends on hard to initiate organizational capabilities based on business processes which distinguish a company from its competitors in the eyes of the customer (Stalk, 1992). It also depends on core competences based on skills and technologies – the collective learning of the organization (Prahalad & Hamel, 1990).

Further writing on the same has emphasised that a firm utilizes its resources and capabilities to create a competitive advantage that ultimately results in superior value creation. The exhibit 3 combines the resource based and positioning views to illustrate the concept of competitive advantage.

Exhibit 3: A Model of Competitive Advantage

![Diagram of Competitive Advantage]

Resource based view identifies resources and competencies that become the basis for a sustained competitive advantage based on whether they provide the company with key strengths or weaknesses to shape the strategic action (Pearce & Robinson, 2005).

Hill and Jones (2002), the distinctive competences of an organization arise from two complimentary sources; **resources** and **capability**. The durability of competitive advantage depends on barriers to imitation, capability of competitors and general dynamism of the industry environment. Resources are the firm-specific assets useful for creating a cost or differentiation advantage and that few competitors can acquire easily. Examples of resources include; patents and trademarks, proprietary know-how, installed customer base, reputation of the firm and brand equity among others. Capabilities refer to a firm’s ability to utilize its resources effectively. An example of a capability is the ability to bring a product to the market faster than competitors. Such capabilities are embedded in the routines of the organization and are not easily documented as procedures and thus are difficult for competitors to replicate.

The capability of a firm is broadly of two kinds i.e. distinctive and reproducible capabilities. Distinctive capabilities are those characteristics of a firm which cannot be replicated by competitors even after those competitors realize the benefits which they yield for the originating company (Kay J, 1999). Distinctive capabilities include Government licences, statutory monopolies, patents, copyrights, and brands, patterns of supplier or customer relationships, skills and knowledge which are embedded in teams. Reproducible capabilities on the other hand can be bought or created by any firm with reasonable management skills, diligence and financial resources. Most technical capabilities are reproducible while marketing capabilities are sometimes distinctive and sometimes reproducible (Kay J, 1999). The competitive advantage is sustainable when the firms’ capabilities are internally aligned and are supportive of each other.
The firms' resources and capabilities together form its distinctive competencies. These competencies enable innovation, efficiency, quality, and customer responsiveness, all of which can be leveraged to create a cost advantage or a differentiation advantage.

2.4 The Value Chain and Competitive Advantage

Porter (1990), argued that competitive advantage arises out of the way in which firms organize and perform value chain activities. Developing a sustainable competitive advantage requires an understanding of the company's value chain as well as the chains of those companies it interacts with. Value chains of companies in an industry differ due to various reasons which include past history, strategies etc. It is useful to separate the business system into a series of value-generating activities referred to as value chain in order to better understand the activities through which a firm develops a competitive advantage and creates shareholder value. Each of these activities can contribute to a firm's relative cost position and create a basis for differentiation (Porter, 1985).

A firm may create cost advantage through reduction of costs of individual value chain activities or reconfiguring the value chain as a whole. A cost analysis assigning costs to value chain activities can be performed and reallocated properly to value creating activities. Differentiation advantage can arise from any part of the value chain. This stems from uniqueness that creates uniqueness in the final product or service offered to the consumer. Many drivers of differentiation also serve as cost drivers resulting in a trade off between costs and differentiation. Ultimately the firm may need to be creative in order to develop a novel value chain configuration that increases product differentiation.

Hill (1995) observed that in many industries competition can be viewed as a process driven by innovation. Competition among oil marketing companies in Kenya has intensified (Isaboke,
Prior to deregulation, the Government set the operating margins through price control for oil marketers. Efficiency was therefore not a prerequisite for survival and success in the industry. Processing at the refinery was based on white oil demand in country and therefore throughput was guaranteed through protection. Under deregulation, however the market players have to set their own profit margins. The companies have to compete on price, product quality and service offered to customers (Nyoike and Oketch, 1999). As a result and once they meet their legal obligation on minimum throughput at the refinery, oil companies have to make choice between processing and importing already finished products to satisfy their market demand thus the relevance of refinery value chain and competitiveness.

To consistently make profits in excess of its cost of capital a company must poses some form of sustainable competitive advantage. Competitive advantage is achieved by a firm when it has value creating processes and positions that cannot be duplicated or imitated by other firms that lead to a the production of above normal economic rents. Durability of competitive advantage depends on barriers to imitation, capability of competitors and general dynamism of the industry environment (Hill and Jones, 2001). It is possible for some companies to temporary make profits above the cost of capital without sustainable competitive advantage. A key difference between competitive advantage and sustainable competitive advantage is that the process and positions a firm may hold are non-duplicable and inimitable when a firm possesses a sustainable competitive advantage. Hence a sustainable competitive advantage is one that can be maintained for a significant amount of time even in the presence of competition. The power of value chain analysis is not so much listing the activities that should be performed and understanding which ones add value to the customer, but it is more about understanding the linkages between the activities (Porter, 1985).
CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research Design

The research problem posed can best be studied using the case study method. Therefore, this is a qualitative research constituting a descriptive case study intended to establish the activities that constitute the value chain of a Refinery business and the extent to which KPRL can use these activities to develop competitive advantage. The research involved an in-depth interview of a single instance; KPRL in this case. Kandie (2001) and Odero (2006) have also used similar descriptive design in related studies.

The advantage of using a case study include enabling an in-depth understanding of the behavior pattern of the concerned unit, facilitating intensive study of concerned unit which is not possible with different methods and possibility of obtaining the inside facts from experienced employees. In addition, the use of the case study method enriches generalized knowledge and makes it possible for the researcher to use one or more methods depending upon the prevalent circumstances e.g. in-depth interviews, questionnaires, e.t.c.

3.2 Data Collection Method

The data collection was done using interview guide (see Appendix I). Self introduction to the respondents on the issue of concern was made through an introductory letter. The respondents were mainly senior management who make both strategic and operational decisions in the company. The key informants were the General Manager and functional managers who are the Manufacturing Manager, Engineering Manager, Operations Manager, Manager Hydrocarbons and Economics, Technology Manager and Human Resources Manager. Other respondents included departmental heads that have key role in the value chain activities. The interview guide was prepared to determine the extent to which value chain activities has been adopted and does
contribute to competitive advantage. Respective respondents were assigned relevant sections of the interview guide.

### 3.3 Data Analysis

Data analysis has been carried out using the conceptual content analysis method to determine the extent of practice of various activities within the value chain of refining business and also determine the key value chain activities that create competitive advantage in KPRL. This method would enable the researcher to focus on activities that create value as a source of competitive advantage. Researchers quantify and analyse the presence, meaning and relationships of words and concepts, then make inferences about the messages or responses as compared to Porters generic value chain.
4.1 Introduction

This chapter dealt with data analysis and interpretation of the research findings. The data in this study was summarized in both narrative and table format. Set out below is a review of the application of value chain in developing competitive advantage at KPRL.

4.2 Value Chain Management Practices in KPRL

In order to gauge the respondent’s appreciation of the KPRL role within the oil industry, the following question was asked: ‘What role does KPRL play in oil products supply in Kenya?’ KPRL provides an alternate source of supply to the importation of fuels and bitumen into the Kenyan market. KPRL allows the customer to access the refining margin achievable by converting crude oil into fuels. KPRL also provides a significant source of hot bitumen into both the Kenyan and East African markets. This is an important role, as the regions ability to hot-import is very limited. Further, KPRL plays a facilitation role within the supply chain, coordinating the various users (Customers) and often driving industry issues through to resolution. This coordination many a times requires corroboration with other supply chain players including Kenya Pipeline Company (KPC), Petroleum Institute of East Africa (PIEA) and the Ministry of Energy among others.

KPRL produces about 60% of the Kenyan White Oil demand and about 95% of Black Oil demand. The Black Oil constitutes of Fuel Oil 125 cst, Fuel Oil 180 cst and Bitumen. KPRL also acts as an alternative supplier of refined products to the country and the neighboring countries hence does not only depend on the importation of finished product. This minimizes the exposure of the country in relation to international price fluctuations and refinery capacity constraints experienced over time. To protect the refinery, the Government directed that all oil
marketers refine some of their petroleum product requirements at the refinery. This minimum requirement (1.6 million tones per annum) is what is referred to as the base load and is underpinned by law through a legal notice. Most of the marketing companies process this quantity in order to comply with the law. Below is the volume of crude in metric tones (MT) processed in the last six years.

<table>
<thead>
<tr>
<th>Throughput (MT)</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.5 M</td>
<td>1.6 M</td>
<td>1.6 M</td>
<td>1.6 M</td>
<td>1.7 M</td>
<td>1.6 M</td>
</tr>
</tbody>
</table>


The respondents indicated that base load is shared pro rata the inland market share of the White Oil products excluding LPG. The other white oil pool include PMS, RMS, DPK, AGO and IDO. The base load numbers are shared out on a quarterly rolling programme based on the last 12 months white oil inland sales. The 1.6 million tons translates to 133 KT per month therefore all Oil companies engaged in the importation of finished products are required to process their monthly base load obligation through KPRL. Crude cargoes are imported in nominal cargo sizes of 80 KT due to the draft limitations at the Jetty where the crude vessel is received. In view of the cargo sizes involved, the crude cargoes are therefore scheduled on the following basis: Quarter one which runs from January to March, five crude cargoes are scheduled each of 80 KT each. This makes a total of 400 KT per quarter against the obligated base load of 399.9 KT per quarter. The same is repeated for the other quarters in the year. The crude oil imported is shared out on the basis the monthly base load allocation.
KPRL is what is referred to as a tolling refinery i.e. one that provides refining services without owning the crude or the products. Respondent are of the view that more value would have been added if KPRL owned the crude and the products and therefore operated as a merchant refinery. This would mean that KPRL would get involved in determining what crude to import, source and timing of the delivery. Prices of crude vary significantly from one type to the other depending on whether it is a heavy or light crude, sweat or sour (with high sulphur content). The sour and heavy crude are relatively cheaper. Significant savings can also be realized in the transportation i.e. freight charges. KPRL currently earns an average refining fee of USD 2.5 per barrel. If it operated as a merchant refinery it would enjoy greater margins selling final products as opposed to taking a fee for services.

According to Johnson and Scholes (2002), a good product could result from how a set of linked activities are performed from design, component manufacture, assembly process core and speed of distribution, storage, installation and after sales services. In most industries it is rare for a single organisation to undertake in house all of the value activities from the product design through to the delivery of the final product or service to the final consumer. In order to understand the extent of application / practice of value chain in KPRL, respondents were asked questions that relate to generic value chain as advanced by various scholars. Respective respondents were assigned relevant sections of the interview guide and the responses from various respondents have been summarized below.

### 4.2.1 Inbound Logistics:

The respondent indicated that crude is purchased by one marketer on behalf of all marketers through open tender system (OTS). Typically undertaken by Chevron, Kenol, Kobil, Shell and Triton. Marine operations are undertaken by Kenya Ports Authority. Crude oil is delivered by small oil tankers of approximately 80,000 tonnes. Most efficient deliveries in other parts of the
world are done in larger oil tankers of up to 250,000 tonnes. This inability to bring in large ships to the port of Mombasa is due to limitations of the harbour. Kenya Ports Authority is planning to dredge the harbour to allow for ships with up to 150,000 tonnes capacity which will result in a reduction in freight charges.

The crude is received and measured, both for quality and quantity. KPRL has facilities to receive and store crude and finished products. KPRL does monitor crude oil ship discharge and receipt activities for storage. The Refinery Scheduler nominates the crude tanks to be used for the discharge. Nominated crude oil tanks should be initialized and sealed jointly with the User’s Surveyors before the discharge commences. It is of the utmost importance that a tanker is turned round within the shortest time. To this aim, an operating guide has been prepared to assist the ship/shore personnel to optimise the performance of crude discharge. Samples of the crude is delivered to KPRL Laboratory as the crude must not be transferred or water drained until clearance is obtained from the Laboratory that test results are satisfactory. The laboratory activities act as support activities to the inbound activities.

For inventory control and management purposes, KPRL maintains records of all products received. Since KPRL does not own the products, product entitlement for each customer is maintained as book quantities which are regularly reconciled to physical global quantities. Customers are issued with stock statements on monthly basis. With regard to inbound logistics low cost is a fundamental basis for competitive advantage. According to Mintzberg and Quinn (1991) cost analysis is important in asset acquisition to rationalize the product mix and price correctly. There is no evidence that KPRL does monitor and analyse costs associated with inbound activities and thus the contribution of inbound activities to competitive advantage can not be deduced.
4.2.2 Operations:

Operations are activities associated with transforming of inputs into final products form, such as machining, packaging, assembly, equipment maintenance, testing, printing and facility operations. In KPRL this includes processing of crude oil into final product through the distillation columns and platformers activities, product quality testing in the lab to confirm specifications among others. Hofer (1986) concluded that for optimal success of an organization there is need for both a strong operating and strategic position.

Operations generally tramlines on 75% Murban crude from the United Arab Emirates and 25% of Arab Medium crude from Saudi Arabia to produce bitumen for the market. A total of twelve crudes are able to be processed, with further options being reviewed. Several key refining activities takes place in transforming crude to finished products. Products have to pass through this value adding activities. Maximum value is extracted from the production process by ensuring that production yields are integrated into the combined product demand slate of the various oil marketers, minimisation of operating cost, minimisation of the consumption of fuel and refinery loss, providing alternative crude choices, thus allowing the customer to leverage the arbitrage available and lastly by providing timely and reliable service.

Below is a summary of crude received and processed into final products in 2007.
<table>
<thead>
<tr>
<th></th>
<th>Opening stock</th>
<th>Receipts</th>
<th>Yields</th>
<th>Deliveries</th>
<th>Closing stock</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Crude Stocks</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arab Medium</td>
<td>Mt ‘000’</td>
<td>Mt ‘000’</td>
<td>Mt ‘000’</td>
<td>Mt ‘000’</td>
<td>Mt ‘000’</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>249</td>
<td>250</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Murban</td>
<td>128</td>
<td>1,354</td>
<td>1,403</td>
<td>0</td>
<td>78</td>
</tr>
<tr>
<td>Slops</td>
<td>11</td>
<td>2</td>
<td>10</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>140</td>
<td>1,604</td>
<td>1,663</td>
<td>0</td>
<td>82</td>
</tr>
<tr>
<td><strong>Products Processed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LPG</td>
<td>1</td>
<td>0</td>
<td>33</td>
<td>33</td>
<td>1</td>
</tr>
<tr>
<td>RMS 87</td>
<td>3</td>
<td>0</td>
<td>51</td>
<td>51</td>
<td>3</td>
</tr>
<tr>
<td>PMS 91</td>
<td>7</td>
<td>69</td>
<td>156</td>
<td>223</td>
<td>9</td>
</tr>
<tr>
<td>DPK</td>
<td>26</td>
<td>5</td>
<td>338</td>
<td>365</td>
<td>5</td>
</tr>
<tr>
<td>AGO</td>
<td>14</td>
<td>28</td>
<td>364</td>
<td>397</td>
<td>9</td>
</tr>
<tr>
<td>IDO</td>
<td>6</td>
<td>0</td>
<td>33</td>
<td>31</td>
<td>7</td>
</tr>
<tr>
<td>Fuel Oil 125</td>
<td>3</td>
<td>0</td>
<td>136</td>
<td>138</td>
<td>0</td>
</tr>
<tr>
<td>Fuel Oil 180</td>
<td>33</td>
<td>0</td>
<td>399</td>
<td>423</td>
<td>8</td>
</tr>
<tr>
<td>HVU Feed</td>
<td>9</td>
<td>0</td>
<td>-1</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Bitumen</td>
<td>0</td>
<td>0</td>
<td>17</td>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>Naptha+Tops</td>
<td>22</td>
<td>0</td>
<td>42</td>
<td>49</td>
<td>15</td>
</tr>
<tr>
<td>Fuel / Loss</td>
<td>0</td>
<td>0</td>
<td>97</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>125</td>
<td>102</td>
<td>1,663</td>
<td>1,727</td>
<td>67</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td>266</td>
<td>1,706</td>
<td>3,326</td>
<td>1,727</td>
<td>148</td>
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</tbody>
</table>

In 2007 out of the total crude received and processed of 1.6 million metric tonnes, this produced 1.5 million metric tonnes of finished products, see table 2. The difference represents fuel used by the refinery and the fuel lost during the production process. On the overall, ex-KPRL products are more expensive than imported products due to fuel costs and production losses that occur during the refinery process. This puts the direct imports of finished products at an advantage when competing with processed products at KPRL. From table 2 above, the residual which is comprised of the black fuels i.e. IDO, Fuel oil and Bitumen, account for about 35% of the total yields which is quite high. The fuel and loss account for about 6%. The respondents are of the view that these two percentages are quite high and therefore does make the refinery uncompetitive.

KPRL has a detailed Refinery Management System, which provides significant training, auditing and management review. The Refinery Management System has detailed surveillance mechanisms, ranging from direct observation to the use of a Distributed Control System (DCS) and independent safeguarding system. The respondents are of the view that any comparison to "best in class" refineries should be made cautiously, as age, size and complexity can generate significant differences. Comparing to similar classed refineries, KPRL has low operating cost, has outstanding safety performance, has mid-field environment performance (though poor sulphur emissions), KPRL has poor reliability and has typical margin which makes it uncompetitive compared to complex refineries.

As a first step to commence compliance on sulphur content in diesel (Gasoil) and respond to customer demands, KPRL is currently working on a project to treat gasoil in its unit U2300 to reduce sulphur content to 0.5%, thus value addition. The respondents indicated that low sulphur diesel attracts higher price. KPRL does burn excess fuel gases from production process. In order to mitigate on fuel and loss and overall energy costs, KPRL is considering putting in place its
own power generation project. The excess fuel gases will be utilized in running the generators and therefore the company will be self reliant on power saving more than Kshs 350 million on annual basis that is paid Kenya Power and Lighting Company. KPRL management has been monitoring performance over the years in order to take corrective action on key activities that add value to final products and services. Key performance indicators are maintained and monitored on efficiency, reliability and Safety. Below is a table with some key performance indicators (KPIs) on efficiency from 2003 to 2007.

Table 3: Efficiency Performance Indicators

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel %WOC</td>
<td>3.61</td>
<td>3.79</td>
<td>3.93</td>
<td>4.15</td>
<td>4.12</td>
<td>4.27</td>
</tr>
<tr>
<td>Loss %WOC</td>
<td>1.08</td>
<td>0.96</td>
<td>1.01</td>
<td>1.45</td>
<td>1.69</td>
<td>0.60</td>
</tr>
<tr>
<td>Flare T/D</td>
<td>3.3</td>
<td>3.4</td>
<td>3.5</td>
<td>5.4</td>
<td>2.95</td>
<td>3.4</td>
</tr>
<tr>
<td>Slops %WOC</td>
<td>2.7</td>
<td>3.6</td>
<td>5.2</td>
<td>8.5</td>
<td>8.8</td>
<td>3.2</td>
</tr>
<tr>
<td>Product Quality</td>
<td>Mill Kshs</td>
<td>14.8</td>
<td>17.8</td>
<td>10.0</td>
<td>8.1</td>
<td>16.2</td>
</tr>
<tr>
<td>Off-Specs Cost</td>
<td>Mill Kshs</td>
<td>0.5</td>
<td>2.8</td>
<td>0.8</td>
<td>20.4</td>
<td>5.7</td>
</tr>
</tbody>
</table>


From table 3 it is clear that a number of items have adverse variances i.e. not acceptable levels compared to target. This include, Loss and slopes (both as a percentage of crude processed), product quality and off-spec costs. Lack of competitive advantage at KPRL has been demonstrated by looking at cost of production and its impact on refining margins. At the point of
entry into the KPRL shore tanks, the cost of crude petroleum products is comparatively lower than an equivalent quantity of refined products. Following the refining process, the cost of ex-KPRL products rises exponentially compared to that of an equivalent quantity of imported finished products. This is attributable to the fuel that is used and that which is lost during the refinery process.

In summary from an operating point of view, the respondents indicated that KPRL is facing various challenges which include low plant utilization, which is restricted to approximately 50% of the total capacity, inability to meet product specification as established by Kenya Bureau of Statistics on specification for unleaded gasoline and low sulphur diesel. In its current configuration, the refinery cannot reduce the sulphur level in the diesel oil it produces. This results in limitations to crude oil processing flexibility and the level of sulphur that can be achieved in the diesel fuel. The current country specification is 0.5% while the refinery production is 1% sulphur content. The KPRL is then restricted to processing sweet crude’s with low sulphur content e.g. Murban which are a lot more expensive. KPRL is viewed as being uncompetitive relative to imported products from modern refineries in Middle East.

4.2.3 Outbound Logistics

KPRL temporarily stores products after processing to be delivered according to planned schedules. Once a customer does process a certain quantity of crude to various finished products, respective product accounts are credited (added) and crude accounts are debited (reduced). Upon each physical delivery to a customer, the respective product accounts are debited (reduced) accordingly. A customer may not have sufficient quantities of a particular finished product, but may however be allowed to overdraw if they have an overall surplus position. Refinery Users are required to table their weekly product requirements for the local market (product to be transferred to the local terminals) to the Refinery Scheduler (RS).
Thereafter the RS prepares a weekly pump over programme that details the volume, date, and the shipper planned to receive the product. This information is communicated to all the Terminal Managers in Mombasa. 60% of KPRL products are delivered to the KPC mainline for upcountry. PMS, RMS, DPK and AGO are delivered via pipeline to Nairobi. LPG, PMS, DPK, AGO, IDO and Fuel Oil is also delivered through the pipeline to the Mombasa terminals. Bitumen and part of Fuel Oil is loaded on trucks at KPRL facilities. Incase of operational difficulties that could result in KPRL not meeting the schedule, KPRL notifies the industry in good time for an alternative source of the product to be identified. Customer requirements are scrutinized to enable KPRL meet the customer requirements in terms of time, quality and quantity.

KPRL has local piping infrastructure (LPG and fuel oil) that otherwise is not available to marketers to import the material. KPRL pipeline system connects to all the terminals from KOSF to Changamwe area and the power plants.

4.2.4 Marketing and Sales

KPRL offers its services to licensed petroleum marketing companies with whom it has signed a processing agreement. Consequently KPRL does not engage directly with final consumers (The public) of petroleum products. KPRL is therefore obligated to provide services in line with the processing agreement and Refinery Data book. Among other things the Data Book stipulates the types of crude’s that can be processed at KPRL and their respective yields. The yields from crude oil are therefore standard as stipulated by the Refinery Data book. The current contractual arrangement does to a large extent emphasize output with operational losses being borne by the customer, thus it is in favour of the refinery and not the customer when there is underperformance.
Matters relating to a new products or services or any other feedback are discussed at the Supply Coordination Meetings (SCM) which is a forum chaired by KPRL where all the Refinery Users are represented. These meetings happen once a month. Initiatives to identify a new additive to be used in the production of Fuel Oil 125 cst and Fuel Oil loadings service were presented to customers by KPRL in June and August 2008. In the past KPRL used to carry out customer satisfaction index survey on a monthly basis. The index addressed the issues of product quantity, quality and timely delivery of products and services among other things.

4.2.5 Services

KPRL does correct off-grade products being imported into the country. The off grade products is re-processed through the Crude distillers to produce on grade product. This is a cheaper option rather than returning the product back to the port of origin. KPRL provide extra storage capacity that can be used to store finished products hence minimizing demurrage that could have been incurred due to vessels waiting for ullage to be created. KPRL provides pipelines connectivity to the Mombasa terminals and the power plants hence products could be transferred to these depots in a safer and cheaper man. KPRL provides training and induction sessions for customers new employees to acquaint them with industry and in particular refining activities.

4.2.6 Procurement

The cost of procurement activities themselves usually represent a small if not insignificant potion of total cost, but often has a large impact on the firms overall cost and differentiation. Johnson and Scholes (2002) affirm that procurement bodies being part of the wider value system do underpin excellence in creating best value in products.

KPRL ensure that products and services are competitively procured to secure lowest possible prices for input purchases of highest quality through tendering processes and procurement
procedures that balance the needs for life-time cost, quality, timely delivery and after-sales support. KPRL / contractor relationship is managed via contractual arrangements e.g. work orders or contracts. There are site meetings, performance measurement and close-out procedures. The contractual framework is structured and executed through, need identification for goods/services, supplier prequalification, supplier identification, supplier recruitment through tendering process, contractual engagement and contract performance, performance measurement through KPI’s, Contract review and improvement.

KPRL does not own the crude and products, as they belong to the marketing companies. Consequently KPRL is not involved in the crude procurement activities other than nominating the types of crude’s required to meet the customer’s requirements. Most of procurement activities in KPRL are in support of the production processes and maintenance of the plant. Most purchases activities relate to chemicals and additives that are used in the production processes. Large quantities of spare parts and equipments are procured for plant maintenance.

KPRL does outsource certain services where it is deemed that it is in the interest of the supply chain to do so. KPRL has outsourced some of the procurement activities by engaging a firm (Procurement Agent) to procure mainly overseas items from Europe. The procurement agent adds value by sourcing competitively, enjoying quantity discounts and consolidating goods from different parts of the world for shipment to Kenya. Outsourcing does occur where in-house expertise is inadequate and better competences can be identified outside the company, for instance in specialized services in technology, IT, engineering, etc. Where the cost of undertaking an activity using in-house resources would be higher than outsourced services then outsourcing will take place. Other situations include, where the activity is not regularly performed e.g. a review of procedures, risk assessment, or the activities are classified largely as “not core to business” or where the services require independent input from outside parties either
as a legal or professional requirement. The responded indicated that the main outsourced services included cleaning services, security, Engineering maintenance services, staff canteen services, medical services among others.

It should however be noted that KPRL procurement activities are limited in that the company is not involved in the procurement of the main raw materials i.e. crude. This is done by the customers through the Open Tender System. Consequently the procurement activities do not support the inbound activities as far as crude is concerned.

4.2.7 Technology

KPRL has invested in key information technology which assist is the production processes. KPRL has a detailed Refinery Management System, which provides significant training, auditing and management review. The Refinery Management System has detailed surveillance mechanisms, ranging from direct observation to the use of a Distributed Control System (DCS) and independent safeguarding system. The technology is used for initiating and controlling of activities in the plant. However it has limitation in that it does not keep or store data. Consequently, a new technology called Process Information (PI) was implemented mid 2008. It is a process management system which replaced another one called infoplus. It picks data real time, keeps history and trends from the DCS which is used for monitoring behavior and analysis for tuning the plant. The respondents are of the view that this new investment in technology is greatly contributing to value addition through the benefits stated above.

The current hydroskimming configuration of the refinery enables it to produce only the amount of each product that is naturally present in the various crude oils that it processes. At an intake of approximately 1.6 million tons per year (see table 1) the demand for fuel oil is met by refinery production. This effectively limits processing to around 50% of the capacity of the refinery
which is between 3.2 - 4 million tones depending with the type of the crude. This is a source of lack of competitiveness of the refinery as there is no value addition as is the case in modern complex refineries. Complex refineries have technologies that enable the cracking of heavy molecules to light products that have higher margins. Key technologies are mainly specific to a product, process or particular resource and this is fundamental to the innovative capacity of the organization, (Johnson, Scholes & Whittington, 2005). Technology development that is related to the product and its features supports the entire chain, while other technology development is associated with particular primary or support activities. Hill (1995) observed that in many industries competition can be viewed as a process driven by innovation. To this extent due to the configuration KPRL has not succeeded.

4.2.8 Human Resource Management

The refinery facilities and infrastructure are fairly complex and do require highly skilled personnel for operation and maintenance. KPRL mainly recruits staff from the Kenyan employment market as provided by local universities and polytechnics. Expatriates have been engaged although in small numbers as some skills are not readily available locally. KPRL does provide elaborate training to staff both locally (in-house) and abroad through Shell Global Solutions International. Cross posting of staff to other refineries and Shell companies is done on regular basis. Consequently skills and knowledge of KPRL staff is rated as high. However there are numerous challenges facing human resource management which include, high staff turnover, lack of training facilities in Kenya which makes it difficult to source experienced operators locally and matching wages and salaries to blue chip companies and in particular complex refineries in Middle East. There is shortage of qualified plant operators due to turnover occasioned by normal retirement and resignations to join complex refineries in Middle East.
KPRL attract employees in job market through advertisements and attachment opportunities offered to University and Polytechnic students who gain an inside view of the organisation. Other sources include use of external consultants. KPRL ensure that the ability of staff is sustained / enhanced to meet target goals and achieve required deliverables through succession planning, staff development and training, cross posting of staff to other refineries and use of expatriates and training resources. KPRL management concedes that it has not undertaken any formal survey to identify employee needs and remuneration value proposition. However in order to ensure that reward and remunerate of employees is on equitable basis and that superior performance is recognized, jobs are graded depending on skills requirement (education level, experience, internal and external interactions) and risk and potential impact levels. Job evaluation process ensures that there is internal parity on job grades between departments. Salary surveys are done for external benchmarking. In 2007, KPRL management adopted the balanced score card system to monitor and evaluate company performance. The tool is used to evaluate and reward staff based on company performance. Respondents are of the view that this will motivate staff as the method is quite transparent.

4.2.9 Firm Infrastructure

The company has a clear organization structure which acts as a tool for implementing strategies. The company is divided into functional lines which include Finance, Manufacturing, Engineering and Human Resources. The company has a strong partnership with contractor companies that are experienced in refinery operations which ensure fast, safe and efficient delivery of services. Strategy formulation and implementation is relatively new in KPRL. A part from Heads of Departments and Management Team other members of KPRL may not be aware of the new mission, vision and strategic goals as envisioned in 2008-2012 strategic plan. Company-wide communication is therefore needed. At Board level and management,
communication is done through quarterly performance appraisals and business planning sessions.

KPRL does not have sufficient capital needed to finance capital expenditure which is crucial to keep an old refinery running. The plant is operating below capacity due to technological constraints as well as market factors. The company has not been growing financially in tandem with economic growth in the country due to the fact that almost all marketing companies have been processing the same quantities of crude in line with the base load requirements (see Table 1) with fees reviews being a challenge due to operational difficulties.

Health safety and Environment (HSE) is a top priority, as stated and committed by Management in the HSE Commitment and Policy. It is ranked highly just like any other business objective e.g. profitability. HSE issues get the greatest prominence in KPRL. The company was recently awarded ISO 14001 certification on environmental management. KPRL has been responding to its social responsibilities in a number of ways. It is involvement in CSR issues is growing but still at low levels since the budget for this activity is Kshs 2 million only. The CSR activities include donation of equipment e.g. computers to schools, participation in environment issues e.g. cleaning, planting of trees, availing sports facilities to the youth of the surrounding community and opportunities for industrial attachments. Others include support of HIV awareness programmes in the community.

4.3 Value Chain and Competitive Advantage at KPRL

The study sought to understand competitive advantage in KPRL. Data to determine this was collected through open ended question that read ‘Indicate 6 activities performed by KPRL that you think make the refinery a preferred choice in the Kenyan market (explain briefly)’. This question sought to determine the respondent’s perception towards what they felt contributed
much towards competitive advantage. The results were analysed through content analysis which captured the most recurrent responses from different respondents.

The refinery does provide an alternative supply source of finished products to the country as a ‘One stop Shop’ through conversion of crude to almost all spectrum of petroleum products needed in the market. The refinery operates a 24 hours service that ensures that customers access their products at short notice. Access to some products like bitumen is key, as the alternative hot import route is heavily constricted, and the importation of bulk cold material has logistics and economic penalty (including reheat energy cost) for the end user. Customers are able to access (albeit limited) road loading. This is a facility that many of the smaller marketers do not currently enjoy, having to instead seek hospitality loading at competitors Mombasa terminals often at inflated rates. KPRL pipeline system connects to all the terminals from KOSF to Changamwe area and the power plants. The Refinery helps Users to keep the 20 day mandatory stocks of LPG required by law. Most of the Oil Marketing companies do not have LPG storage facilities hence KPRL is an alternative. It is cheaper to produce Fuel Oil and Bitumen from the Refinery rather than importing due to the logistical constraints. KPRL corrects off-grade products imported into the country or contaminated products during transportation or storage. Reprocessing at KPRL is a cheaper option. A side benefit to refining activity is that marketers are able to sight crude pricing as a key driver of their margins, despite half the product being instead driven by the Gulf spot market prices.

From the analysis we deduce that some value chain activities are perceived to be a strength and therefore do create competitive advantage to a larger extent than others. From the study it is evident that operations and technology are key to competitive advantage. A recent study contacted at KPRL by Foster Wheeler Consultants, in order to address the issue of the refinery’s competitive position against imported products, did propose the upgrade of the refinery to a semi
complex configuration. This can be achieved through the addition of residue conversion facilities to covert fuel oil into lighter more valuable products. The process to enable this is known as a Thermal Gas oil Unit, or TGU. The TGU provides very high added value to the refinery processing in three ways: one by converting some of the fuel oil to lighter products the outturn of the refinery has a higher value and less fuel oil is produced per ton of crude oil processed, secondly higher crude oil processing is possible for a given fuel oil demand and therefore by constructing incremental capacity the entire diesel production of the refinery can be desulphurised at relatively little extra capital cost. Since crude oil selection will no longer be linked to the resultant sulphur level in the diesel, this has the advantage of increasing crude oil processing flexibility and allowing cheaper crude's to be selected, as well as enabling the refinery to meet the new low sulphur diesel specification. The new technology will add value and increase crude intake. The estimated cost of the investment is approximately USD 400 million. The resulting efficiency improvements as well the ability to produce environmentally friendly products will enable the utilization to be raised from 1.6million tones up to 4 million tones per year and increase the production of LPG from the current 30,000 tones to 110,000 tones.
CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATION

5.1 Introduction

This chapter presents the summary, discussions and conclusions from the research findings as per the objective of the study. Based on the findings, recommendations have been given regarding the application of value chain in developing competitive advantage at KPRL.

5.2 Summary

Value chain management is a concept that is practiced in KPRL. The company has systems, procedures and structures that promote the practice of value chain. The company has broken down the sequence (chain) of business functions into strategically relevant activities through which utility is added to products and services. Value chain is undertaken in order to understand the behavior of costs and the sources of differentiation. Although issues of quality of products and services are important, its not customer perceptions that seems to drive competition in KPRL.

There are limitations to value chain as a concept and a tool of strategy at KPRL due to various challenges within the various activities. The study has shown that KPRL is facing challenges which include low plant utilization, inability to meet products specifications, fuel and loss (high energy costs), low customer focus and in particular technology deficiency. Performance is mainly assessed by the output that is geared toward meeting the customer’s monthly programmes. Processing at KPRL is basically driven by the need to comply with the legal notice as opposed to economic and value addition considerations. In effect KPRL does loss value due to customers as supported by the large quantities of residual products and the fuel usage and loss numbers. Although there is evidence of periodical assessing of performance using efficiency
approaches, there is lack of action mainly due to technological inhibition associated with refinery configuration. The refinery has no residual upgrade capability.

The fact that KPRL does register significant fuel and loss quantities, physical losses through the distribution and delivery activities can not be ruled out. KPRL does not charge a separate fee for receipt and delivery of products to customer terminals through its pipeline network infrastructure. There is no evidence that KPRL does monitor and analyse costs associated with the inbound and outbound activities and therefore their contribution to competitive advantage could not be deduced. The under utilization of the refinery is due to efficiency limitations arising from the available hardware. Low plant utilization which is restricted to approximately 50% of the total capacity is linked to lack of residue upgrading capability. There are, however, plans to install residue conversion and gas oil treating units to improve efficiency of the refinery at a cost of US$400 million. The resulting efficiency improvements as well as the ability to produce environmentally friendly products will enable plant utilization to be raised from the current 1.6 million tones up to 4 million tones per year. The projected benefits that will accrue should act as an incentive to the company and shareholders to raise the required capital for the upgrade project.

The overall economics or value addition of the refinery depends on the interaction of three key elements: the choice of crude oil used, the complexity of the refining equipment and the desired type and quality of products produced. Refinery utilization rates and environmental considerations also influence refinery economics. Using more expensive crude oil (lighter, sweeter) requires less refinery upgrading but supplies of light, sweet crude oil are decreasing and the differential between heavier and sour crude oils is increasing. Using cheaper heavier crude oil means more investment in upgrading processes. Costs and payback periods for refinery processing units must be weighed against anticipated crude oil costs and the projected
differential between light and heavy crude oil prices. Crude oil and refinery configurations must take into account the type of products that will ultimately be needed in the marketplace. The quality specifications of the final products are also increasingly important as environmental requirements become more stringent.

5.3 Conclusions

Competition from cheaper imported refined products from complex refineries remains the single most and biggest threat to the future of KPRL. To secure the future of the refinery there is need to enhance value creation. The findings of the study indicate that KPRL has in place systems, processes and structures that support value chain in terms of both primary and support activities. Although there are various activities that create value in KPRL, operations and technology related activities stand out as the ones through which significant value is either lost or not enhanced. As a result of technological limitations associated with the refinery configuration some key activities have not delivered the much needed competitive advantage mainly due to high residual oil, excessive fuel usage and loss. In KPRL competitive advantage can be achieved from increased flexibility on crude selection, increased residual conversion capability and reduced energy costs. Maximum value has to be extracted at all stages of crude / product conversion and delivery / distribution for greater customer satisfaction. Merchant refining should be considered post upgrade to ensure backward integration to accrue benefits on crude trading. The proposed refinery upgrade project should be pursued in order to enhance value creation through cost reduction for greater margin realization.
5.4 Recommendation for Further Research

Merchant refining post refinery upgrade may present an exiting opportunity for further study on value chain. Unlike now were KPRL does not own the crude and the products, the proposed study should investigate how KPRL creates value from acquisition of crude through transformation to finished products sold to final consumers.

With the world refining capacity being currently constraint, coupled with increased prospecting for oil in Kenya and the region, the scope of study can be extended to cover other refineries of similar configuration in the region.
REFERENCES

Ansoff, H., Macdonell E. (1990). Implementing Strategic Management, Practice Hall Cambridge, United Kingdom


APPENDIX I - Interview guide

This is a management research proposal about KPRL submitted to the University of Nairobi in partial fulfillment of the requirements for award of the Degree of Masters of Business Administration.

Section A: General Information:-

1. What role does KPRL play in oil products supply chain in Kenya? (General Manager)

2. Indicate 6 activities performed by KPRL that you think make the refinery a preferred choice in the Kenyan market (explain briefly) (All respondents)

Section B: Value Chain Activities:-

I. Inbound Logistics: (Manager Hydrocarbons and Economics)

3. How does KPRL determine the crude import requirement?

4. How does KPRL monitor crude oil ship discharge and receipt activities for storage?

5. What processes, logistics and other control measures are in place for inventory management?

II. Operations: (Manufacturing Manager / Operations Manager)

6. How is crude transformed into finished products?

7. How does KPRL ensure that maximum value is derived from the production process?
   Explain.

8. How does KPRL ensure that all operations conform to required procedures and standards?
   How do the operations compare to “best in class” refineries?
9. Does KPRL have mechanisms for monitoring efficient operations and detection of any product losses or operational flaws? If yes, how are any flaws in processing addressed and corrective action taken?

III. Outbound Logistics: (Manager Hydrocarbons and Economics)

10. Does KPRL store products processed before delivery? If yes, how are customer entitlements monitored?

11. How does KPRL ensure timely delivery of products to customers?

12. Does KPRL handle all deliveries to customers? What is the mode of transportation?

IV. Marketing and Sales (Manager Hydrocarbons and Economics)

13. Do you scrutinize requirements of your target markets?

14. How do you make your customers/ refinery users aware of the products and services provided by the refinery? To what extent do you roll out any new product/services to the market?

15. Does the company seek feedback from the customers / refinery users on the level of services provided? Explain.

16. How does KPRL ensure effective resolution of customer queries?

17. How do you differentiate your product/service to ensure the customer has a variety to choose from?

18. What contractual framework exists between KPRL and customers?

V. Services: (Manager Engineering / Laboratory Manager)

19. Do you carry out regular plant, equipment and tank maintenance programmes? How do you monitor the activities and the frequency of the maintenance?

20. How does KPRL enhance or maintain the value of its products after delivery?
VI. Procurement:  

21. How do KPRL ensure that products and services are competitively procured to secure lowest possible prices for input purchases of highest quality?

22. How is KPRL / contractor relationship managed? What is the contractual framework?

23. Does KPRL outsource any of its activities? If so, what forms the basis of outsourcing? Provide examples.

VII. Technology:  

24. Is KPRL currently facing any significant technological challenges? Explain.

25. How does the refinery respond to the changes in technology advancement?

26. What technological development can the refinery practically afford to undertake?

27. Are processes regularly upgraded? If so, explain the basis of the upgrades?

28. Is KPRL IT system integrated?

VIII. Human Resource Management:  

29. What challenges is KPRL facing in human resource management?

30. How do you rate the skills and knowledge of KPRL staff?

31. How does KPRL ensure that the ability of staff is sustained / enhanced to meet target goals and achieve required deliverables?

32. Do you set sufficiently stretched performance targets for your staff? Are the targets discussed and agreed with staff? How is performance monitored?

33. How does KPRL ensure that reward and remunerate of employees is on equitable basis and that superior performance is recognized?
34. Does KPRL carry out regular surveys to identify employee needs and remuneration value proposition?

35. How does KPRL attract best employees in job market?

IX. Firm Infrastructure: (General Manager / Health Safety and Environment Manager / Chief Accountant/ Legal Advisor)

36. How is the company organized in ensuring efficient delivery of services?

37. Does KPRL have any resource constraints? Explain

38. Does the management effectively communicate to staff the Company Mission, Vision and strategic plans?

39. How do you rank the importance attached to Health, Safety and Environment requirements / standards?

40. How does KPRL respond to its social responsibilities? Please give examples.
## APPENDIX II: List of Oil Companies and Respective Market Share

### Market Shares - Kenya Inland Petroleum Sales
#### January - June 2008

<table>
<thead>
<tr>
<th>Company</th>
<th>Market Share %</th>
</tr>
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<tbody>
<tr>
<td>1 Kenya Shell</td>
<td>21.31</td>
</tr>
<tr>
<td>2 Total Kenya</td>
<td>20.07</td>
</tr>
<tr>
<td>3 Kobil</td>
<td>18.06</td>
</tr>
<tr>
<td>4 Chevron</td>
<td>12.10</td>
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<tr>
<td>5 Libya Oil</td>
<td>7.88</td>
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<tr>
<td>6 Kenol</td>
<td>5.20</td>
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<tr>
<td>7 National Oil</td>
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<tr>
<td>8 Gapco</td>
<td>2.62</td>
</tr>
<tr>
<td>9 Bakri International</td>
<td>1.93</td>
</tr>
<tr>
<td>10 Galana Oil</td>
<td>1.30</td>
</tr>
<tr>
<td>11 Engen Kenya</td>
<td>1.12</td>
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<td>17 MGS International</td>
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<td>18 Intoil</td>
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<tr>
<td>22 Hashi Empex</td>
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<td>27 Metro Petroleum</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.00</strong></td>
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Source: Petroleum Institute of East Africa (PIEA) website