TECHNOLOGICAL RESOURCES FOR SUSTAINABLE COMPETITIVE ADVANTAGE IN MANUFACTURING: CASE OF SELECTED COMPANIES

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Research Project submitted in partial fulfillment of the requirements for the award of the Degree of Master of Business Administration, School of Business, University of Nairobi.

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DECLARATION

This research project proposal is my original work and has not been presented to any learning institution for award of any degree.

Signed..... Date 14 November 2009

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This research proposal has been submitted for the examination with our approval as University Supervisors.

Signed..... Date 18/11/09

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Signed..... Date 17/11/2009

S.O. NYAMWANGE

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LIST OF ABBREVIATIONS/ACRONYMS

ADB	-	African Developmnt Bank
AMT	-	Advanced Manufactutring Technology
ArchiCAD	-	Architectural Computer Aided DEsign
ARM	-	Athi River Mining Company Limited
AutoCAD	-	Automated Computer Aided Design
BAAN	-	Baan ERP0-Enterprise Planning by BAAN
BBC	-	British Broadcasting Corporation
BCL	-	Bamburi Cement Limited
CAD	-	Computer Aided Design
CEO	-	Chief Executive Officer
CNC	-	Computerized Numerical Centres
CNN	-	Cable Network News
COMESA	-	The common Market for Eastern and Southern Africa
COYA	-	Company of the Year Award
CO_2	-	Carbon Dioxide
CUF	-	Capacity Utilization Factor
DPS	-	Dividends Per Share
EABL	-	East African Breweries Limited
EAPCL	-	East African Portland Cement Limited
EDI	-	Electronic Data Interchange
EPS	-	Earnings Per Share
ERP	-	Enterpise Resources Programme
EVA	-	Economic Value Added
GE	-	General Electric Company Limited
GoK	-	Goverment of Kenya

HACCP	-	Hazard Analysis and Critical Control Points
HIV	-	Human Immuno-deficiency Virus
Hl/Hl	-	Hecto litre (water) per Hecto litre (beer)
IBM	-	International Business Machines Company Limited
ICDC	-	International Commercial Development Corporation
ICT	-	Information and Communications Technology
IPP Media	-	Tabzanian Media Controlled by IPP Group of Companies
ISO	-	International Standards Organization
KANU	-	Kenya African National Union
KBL	-	Kenya Breweries Limited
Kcal/Kg	-	Kilo-calories per Kilogram
KES	-	Kenya Shillings
Kg/Hl	-	Kilogram/Hecto-litre
KIRDI	-	Kenya Industrial Research Development Institute
KPI	-	Key Performance Indicators
KWIC	-	Key Word in Context
LAN	-	Local Area Network
Ltd	-	Limited
MG	-	"Morris Garage" (Started 1924 by William Morris and Kimber Converting from Garages to MG Sports Cars Manufacture
MJ/Hl	-	Mega-joules per Hecto-litre
MRP	-	Materials Resource Planning
MSCL	-	Mumias Sugar Company Limited
Musco	-	Mumias Sugar Company
NEPAD	-	The New Partnership for Africa`s Development
NSE	-	Nairobi Stock Exchange
OHSA	-	Occupational Health Safety Act
P/E	-	Price per Earnings
PLC	-	Programmable Logic Controllers
PIPs	-	Profitability Improvement Projects
Pr. Eng	-	Professional Engineer
R & D	-	Research and Devevelopment
RBT	-	Resource Based Theory
RBV	-	Resource Based View
RF	-	Reliability Factor
SAB Miller	-	South African Breweries Miller Limited
SAP	-	Structural Adjustment Programme
SCA	-	Sustainable Competitive Advantage
SCADA	-	Supervisory Control And Data Acquistion
TYTP	-	Three-Year Technical PLan

ABSTRACT

Both strategic management and operations management experts have handled the resource-based view. In the paper, technological advances in the resource base were the main focus in addressing the large manufacturing companies with operations with a narrowed focus from three companies. Unlike service industry, manufacturing industry involves large outlays of capital to make technological improvements. Nevertheless, firms that adopted continuous improvement approaches are more tactfully prepared to adapt to change. It has been stated by change management experts that the only thing that is constant is change.

The equipment and technologies selected require flexibilities in order to keep up with the inevitable fast changes that are eminent due to the advent of the Information technology age and the world opening up to one global village. As the borders have become more porous, focus by manufacturing companies on competitive technologies networking with successful world-class firms, strategic partners are the in-thing that keeps a firm afloat without fear of collapsing or crushing.

Resources that generate economic rent for a company, as well as the synergistic combination that a large manufacturing firm creates is responsible for its sustainable competitive advantage over rivals and this position does not remain static. In the ever-changing world, the company that is alert and tactically responsive to the market and customer and operational dynamics, is ready to counter any shocks and challenges the new scenario may bring.

The level of addressing this technological resource-based view has varied across the three companies with results proportional to the amount of involvement of all people stake holding the company. Data has been collected from the Archives, interviews, newspapers and published reports. The results are advancing the resource-based view for technological resources for all manufacturing firms.

CHAPTER ONE: INTRODUCTION

1.1 Background

Resource based view of strategy was first coined by Wernerfelt (1984) to advance the idea that strategy is a function of the complement of resources held, but earlier efforts are traced to Coase (1937), Selznick (1957), Penrose (1959), Stigler (1959), Chandler (1962, 1977), Skinner (1969, 1984) and Rumelt (1984) among others.

Strategy has been defined as "the match an organization makes between its internal resources and skills ... and the opportunities and risks created by its external environment" (Buzzel & Gale, 1997). The essence of Resource based model is that competitive advantage is created when resources that are owned exclusively by the firm are applied to developing unique competencies. The resulting advantage can be sustained due to lack of substitution. A company will be positioned to succeed if it has the best and most appropriate stock of resources relevant for its business and strategy [Gagnon, 1999; Kaplan & Norton, 1996)].

Gagnon (1999) argues that theories of resource-based view of strategic management should be integrated into operations strategy research. Going beyond the model of Hayes and Wheelwright (1984), this would call for the end of market-based view where the operations strategy merely follows the directions set by the marketing function. It would emphasize the dynamic development and leveraging of competencies and capabilities in order to set new business diversification strategies. A new paradigm of Operations could emerge, where "management fundamentals" such as learning and culture would be actively integrated within operations, in order to become key sources of competitive advantage. Accordingly, the operations function could progressively; take the leadership of strategy formulation; create "portfolios" of optional capabilities for strategies of organizational agility; and implement world-class practices more effectively through evolutionary strategic frameworks.

Grant (2001) found out that there has been a resurgence of interest in the role of the firm's resources as the foundation for firm strategy. Several companies whose

strategies have been based upon developing and exploiting clearly defined internal capabilities have been adept at adjusting to and exploiting external change. In addressing the technological resources, the link with manufacturing and operational strategy is the arena for the discussions. This argument is in line with Ansoff's (1998) model of strategy and organizational capability in a fast changing environment. Strategic aggressiveness must be appropriate for each level of environmental turbulence. Organizational capability must be appropriate for each level of strategic aggressiveness. Johnson and Scholes (2002) agree with this model by defining strategic fit as developing strategy by identifying opportunities in the business environment and adapting resources and competencies so as to take advantage of these. Porter (1991) is in the same line of argument.

Kenya Industrial Research Development Institute defines manufacturing industry as referring to the sector of the economy that is concerned with the production of goods from raw materials using organized labor and production systems with the aid of machinery (KIRDI, 1997; Nyamwange, 2001). Dilworth (1992) says that manufacturing operations perform some chemical or physical processes such as weaving, sewing, welding, grinding, blending, refining or assembling to transform their raw materials into some tangible products. The manufacturing firms in Kenya are seen as important catalysts to industrial transformation (Government of Kenya Paper Session Paper No. 2, 1996) and economic development (Coughlin & Ikiara, 1988).

In Kenya, Nyamwange (2001) studied operational strategies pursued by large manufacturing firms to achieve competitiveness in the turbulent "libero-global" environment and found a few firms already focused on the operational/manufacturing strategy. Waruingi (2003), Owuor (2003), Kahigu (2003) looked at Information and Communications Technology as a technological resource to be exploited for competitiveness in face of business challenges locally and globally. Leting (2003) went in-depth to show the representative technologies in a firm's value chain. This approach in a way supports the Resource based view of the technological resources.

Grant (2001) illustrates how technological resources contribute to both cost and differentiation advantages, which lead to the named world famous firms gaining competitive advantage that resulted into rates of profit in excess of the competitive levels. These are process technology, size of plants and access to low cost inputs resulting in cost advantage, while brands, production technology, marketing distribution and service capabilities result in differentiation advantage.

Considering resources, manufacturing and technology, Phrontis (2006) describes resources as inputs into a firm's production processes, which can be classified into three categories: Physical capital, human capital and organizational capital. A capability is a capacity for a set of resources to interactively perform a stretch task of an activity. While capacity is the extent of the system`s ability to deliver the service it was designed to deliver. Capacity is defined as the maximum rate of output.

Resource Based View or Resource Based Theory (RBV/RBT) is based on the conce of economic rent and the view of the company as a collection of capabilities. Achie Sustainable competitive advantage (SCA) by continuously developing existing a creating new resources and capabilities in response to rapidly changing mar conditions. Resource Based View emphasizes economic rent creation thro distinctive capabilities. Economic rent or economic value added (EVA) is v companies earn over and above the cost of the capital employed in their business. the measure of the competitive advantage, and competitive advantage is the only n by which companies in competitive markets can earn economic rent – as th investments or acquisitions which yield less than the cost of capital – destroys The perspective of economic rent forces the question "Why can't the competit that?" into discussion. Distinctive capabilities cannot be replicated by comp while competitors can replicate Reproducible capabilities (Kotelnikov, 2007). I technological resources are people skills, plant, parts, processes and pro planning and control and time. The synergistic combination gives the sus competitive advantage resulting from the internal capabilities necessary for formulation and implementations.

Technology is the art (technique) of doing things emanating from the knowledge of theories, hypotheses and facts of science. This includes practical sciences, equipment and tools, innovations, demand flow technology, automation includes feedback and control, information and communication technology, logistics, materials handling, processes, manufacturing, etc. A level of technological advancement gives a firm an edge over its rivals depending on whether these resources are blended synergistically (Barney, 1991; Kotelnikov, 2007).

Due to advances, computer technologies are integrated into the manufacturing processes interfaced with other supportive functions depending on the suitable overall Information Communications Technology system adopted in line with all functions of production, maintenance, parts procurement, inventory stock management, relationship with suppliers and customers (both internal and external). These aid in lean manufacturing, computer aided design (ArchiCAD and AutoCAD), computerized maintenance management systems, centralized data collection, simulation, control and feedback systems, process automation, online condition based monitoring, automatic feed and extraction systems. Mwangi (2002) considers most of these, but avers that service industries are the only leading firms in these computerized technologies. Large manufacturing firms like East African Breweries Limited, Bamburi Cement Limited and Mumias Sugar Company Limited have bigger capital investments in equipment; would they sacrifice these not to be computerized, fast enough?

It is the researcher's view that technological resources East African Breweries Limited, Bamburi Cement Limited, Mumias Sugar Company Limited as larges manufacturing firm use to create sustainable competitive advantage are various and it is important to search the question on whether they are awake to the quick changes encompassing the competitive nature of the global village (for that is what the world has become now) with the advent of Web services, Information and Communication technologies and internet usage (Phrontis, 2006; Johnson & Kaplan, 1984).

1.2 Statement of the Problem

Hecox (1988) says the Kenya government in the first 25 years of independence protected local manufacturers through a number of controls among them quantitative import restrictions, constant price controls, and direct involvement in manufacturing like Agro based manufacturing, mining, high tariff levels and subsidies. Some of the concessions were "sometimes extraordinarily generous" (Nyong'o, 1988) which led to the inefficiency of manufacturing companies and high operating costs which were subsequently passed to the consumers (Coughlin & Ikiara, 1988; Nyong'o, 1988; Mbeche,977). The researcher believes the protection has lingered on for the manufacturing sector.

The manufacturing sector in Kenya in the last 20 years has experienced increased local competition as well as competition from imported goods and services (Coughlin & Ikiara 1988; Mbeche, 1977; Nyong'o, 1988; GoK Session Paper No.2, 1996; Kirubi, 1999; Kombo, 1997; Munyiri, 2000; Gekonge, 1999; Owiye, 1999; Kangoro, 1998; Chune, 1998; Mumbi, 1998). Structural adjustment programs which the government adopted in the 80's accelerating through to the 90's and much faster in the post-KANU era of 2002 – 2007. These emphasized export promotion, improved availability of imported inputs, elimination of quantitative import restrictions, privatization of Government's commercial activities and decontrolling of prices were among the many changes (Hecox, 1988; Government of Kenya Session Paper No.2, 1996). This is the new order of running Kenya. Regional and global treaties have been signed, freed interest and exchange controls. Some of the many global and collaborative treaties are with World Trade Organization, COMESA, East African Community and NEPAD (GATT, 1994).

This liberalization has exposed local manufacturing firms to strong competitive and rivalrous pressures. Many of these manufacturing firms lost businesses due to strong competition. A more informed consumer can choose value for his money's worth from the variety of goods in the market (Dilworth, 1992). For companies that have adopted manufacturing/operations strategy and are successfully moving to world-class status cannot ignore the Resource Based View, the latest paradigm that reinforces the manufacturing/operations strategy even more (Gagnon, 1999).

The researcher avers that Mercedes relies a lot on differentiation, while Toyota relies on low-cost strategy from their technological resource bases for sustained competitive advantage over their rivals and this is supported (Wal-Mart, 14 May 2007; Schonberger, 1986). Arguments against the resource based technological resources have been leveled against the mismatch of the technological advances, with the strategies selected. It is also leveled against poor preparation of the resource skills into their manufacturing. The researcher has yet to come across any strong argument so far against the Resource Based View in entirety as it is a scientifically thought out paradigm that those who have embraced it have come out much stronger and focused over the global challenges (Barney. 1991; Gagnon, 1999; Grant, 2001; Shneiderman, 2001; Gaw, 2006; Kotelnikov, 2001)

Kotelnikov (2001) mentions management flexibility as the strength to technological resource success in assortment of the various quality management measures. Inconsistencies could be said to arise from companies that shed off some of their age-old resources in the name of concentrating on core-business and when these firms fail to strategize to outsource determines as to whether they survive the changes or are swallowed up by the competition (Dooner, 1991; Gaw, 2007 and Chanzu, 2003).

Challenges, as cited earlier, have been monopolistic protection Kenyan manufacturers previously enjoyed and many still thought the Government would continue to play that guardian role. Times have changed however. The entry of South African companies after their release from apartheid rule, notably South African Breweries in Kenya and East Africa Region, the mushrooming of soft drinks manufacturers and hard liquors, entry of duty free sugar, increase of cement products on the market, among others gave a real wake to sleeping giants and it is worth the while to find out how they have reacted to these changed scenario and freed markets to take advantage and grow in to the global arena, while maintaining the home grip or perish and give way to liberalized and long sighted new comers. This was first pronounced in the BBC News of 14 May 2002. The same was reiterated in various media namely IPP Media of 22 May 2002, www.mambogani.com in 2004, Financial Standard of July 2004, Musco Newsletter of

June 2006, East African of 07 August 2007, as well as more recently at www.mystocks.co.ke of 04 September 2007.

Technological change would be the modifications to the work methods an organization uses to accomplish tasks. "The flexibility of the plant depended much more on people than any technical factor, Although high levels of computer integration can provide critically needed advantages in quality and cost effectiveness, operational flexibility is determined primarily by a plant's operators and the extent to which managers cultivate, measure, and communicate with them" reports an expert after studying a huge new computerized paper production process at Mead Corporation's Escanaba Michigan plant (Dessler, 2004).

When the level of environmental turbulence changes, the historical level of organizational ability may become a major obstacle to the organizational ability to adapt to the new challenges (Porter, 1991; Ansoff, 1990 & 1998). With these obvious ever-changing trends to survival for Kenyan manufacturing firms and incoming technologies, our research problem would direct our efforts to latest paradigms, in this case the Resource Based View.

1. Has the Resource Based View permeated into East African Breweries, Mumias Sugar Company, and Bamburi Cement manufacturing operations?
2. Do the technological resources and capabilities a Kenyan manufacturing firm (EABL, MSCL and BCL) holds give it a sustainable competitive advantage over its rivals?

1.3 Research Objectives

The objectives of the study were:

a) To establish technological resources and distinctive capabilities, those that give a large manufacturing firm (East African Breweries Limited, Bamburi Cement Limited and Mumias Sugar Company Limited) a sustainable competitive advantage.

b) To determine challenges in applying Resource Based View in a large manufacturing firm at East African Breweries Limited, Bamburi Cement Limited and Mumias Sugar Company Limited.

1.4 Importance of the Study

a) Manufacturing firms

The finding that competitive advantage rather than external environments is the primary source of inter-firm profit differentials focuses attention upon sources of the competitive advantage. This will go a long way to create awareness for the Kenyan manufacturers to competitiveness. For example the ability to establish a cost advantage may require possession of scale efficient plans, superior process technology, ownership of low-cost source of raw materials, access to low wage labor, strategic partnerships for resource building. A company would then be positioned to succeed if it has the best and most appropriate stock of resources relevant for its business strategy by putting like things together in its own unique manner. These are functional skills, know-how, technology and facilities and, power structure within and among functions.

b) University Database

This study should enhance the database for related studies by other scholars on the subject of Resource Based View and an extra link to the Operations strategy. New questions that will arise should lead to further research.

c) Management Consultants

The study findings would give consultants an avenue to exploit to bring to the forefront the way forward for manufacturing firms and cause for further pursuance by consultancy.

CHAPTER TWO: LITERATURE REVIEW

2.1 Manufacturing

Kenya has the most industrially developed economy in East Africa. The manufacturing sector has grown significantly since the 1960s. In 2005 industry, which includes mining and construction, contributed 19 percent of GDP. Kenya's chief manufactures include food products, beverages, cigarettes, textiles and clothing, cement, rubber products, transport equipment, printed materials, and petroleum and other chemicals (MSN Encarta, 2007)

Mining which gives input resources to manufacture employs only a small number of Kenya's workers. The main minerals produced are soda ash from Lake Magadi, fluorite, salt, and limestone products. The government is also seeking to exploit titanium and zircon deposits on the coast of the Indian Ocean. The bulk 80% labor force is employed by agriculture and associated processing covering manufacturing. (Pricewaterhouse Coopers, 2007). The balance manufacturing is from imported inputs.

2.1.1 Manufacturing Strategy

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2.2 Resource Based View

2.2.1 History summary

Resource based view of strategy was first coined by Wernerfelt (1984) to advance the idea that strategy is a function of the complement of resources held. Earlier efforts are traced in the works of Coase (1937), Selznick (1957), Penrose (1959), Stigler (1959), Chandler (1962, 1977), Skinner (1969, 1984) and Rumelt (1984) among others.

The essence of Resource based model is that competitive advantage is created when resources that are owned exclusively by the firm are applied to developing unique competencies. The resulting advantage can be sustained due to lack of substitution. A company will be positioned to succeed if it has the best and most appropriate stock of resources relevant for its business and strategy (Gagnon, 1999).

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for strategies of organizational agility; and implement world-class practices more effectively through evolutionary strategic frameworks.

Mercedes relies on differentiation while Toyota relies on low-cost strategy. The success of German and Japanese motor and industrial manufacturing relies in their competitiveness from a very well developed and nurtured resource base technologically whose synergistic combination is difficult to replicate and often durable as it is not static, and for Japan continuous evolution for sustained competition into the future (Wal-Mart, 14 May 2007). George Bush Senior (CNN news, 7 Jan 1992 and Financial Times, 15 Jan 1992) visited Japan with a sole purpose to discuss and appreciate what makes Japan industry sustainable and competitive even through hard times as well as resolve the then trade deficit that was tipped in favor of Japan and advised American companies to use their enormous stock of resources to correct the imbalance. Six-Sigma is a follow-up American version from Japan's Total Quality Management and Kaizen. The American version of Business Process Reengineering brought down very many firms that rushed into the approach and competitors swallowed others. Pedler et al. (2000) and Grant (2001) aver successes in the world-class companies studied are based on their distinctive resources and capabilities.

2.2.2 Proponents of Resource Based View

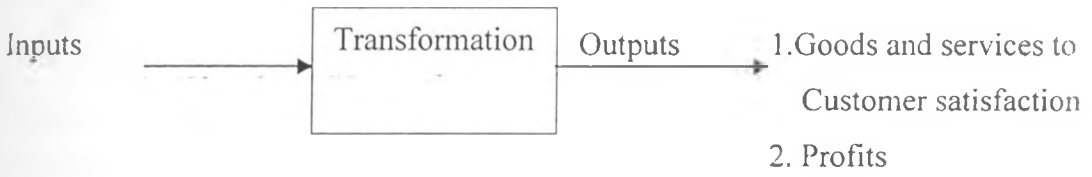
Grant (2001) avers that the essence of resource-based approach in projecting sustainable competitive advantage is the primary road to follow and the market-based as secondary. There has been a resurgence of interest in the role of the firm's resources as the foundation for firm strategy. Several companies whose strategies have been based upon developing and exploiting clearly defined internal capabilities have been adept at adjusting to and exploiting external change. He gives the example that Honda's focus upon technical excellence of 4-cycle engines carried it successfully from motorcycles to automobile to a broad range of gasoline-engine products. Competitive advantage ultimately can be attributed to ownership of valuable resources that enable the company to perform its activities better than competitors.

No two companies are alike in terms of resources they hold; companies have different collections of resources: (tangible and intangible) assets and capabilities. As capabilities are related to capacity he goes further to name components of capacity as human resource, facilities, equipment, tools, time, customer participation, and alternative sources (internal an external). He gives internal alternative sources as mothballed machines, extension of working hours and use of multiple shifts. And external alternative sources as subcontracting, acquiring another company and leasing resources (Kathuria & Partoui, 2000).

2.2.3 Operational Resources

Management consultant companies 12manage (2006), 1SixSigma (2006), and 1000ventures (2006) give operational resources as 6P's (People, Plant, Parts, Processes & Procedures, Planning & control) or 6M's (Men, Materials, Money, Methods, Machines & Mother Nature). Leong and Ward (1995) give them as 6 P's of manufacturing strategy.

Fig 2.1: Operational resource transformation



Kotelnikov, V. (2007). Resource-Based View (RBV) of Firms: Resource-based Model; Achieving Superior Returns by exploiting Internal Resources and Capabilities. Posted on 23 Sep 2007 @ http://www.1000ventures.com/business_guide/mgmt_strategic_resource-based.html Adapted from "Strategic Management" (Eds) (2001), 1000ventures.com

Transformation resources are given as specialized or generalized (flexibility) equipment, Information Technology, Automation & Control Systems and processes.

Input resources are given as leadership, improvement approaches, materials, market information (customer based), teaming and partnering.

Competencies and capabilities can de divided into five categories: Human resource special skills, existing technology, special values (team culture, safety performance,

product brands, company brand, internal and external teaming and strategic partnering), Information and Communication Technology (computerized manufacturing, intranet, extranet and networking), and value chain (internal and external customer/supplier) (Ongwae, 2002; Mumbi, 1998; Motari, 2003; and Lutta, 2003).

As Kenyan manufacturing firms consistently cry foul, the moment liberalization of both the local, regional and global markets is talked about, with some firms having acquired specialized resources, the wake up call has to be loud and a clear look into the areas that need to be looked into will include the synergistic exploitation of available resources (Obado, 2005). Mulama (7 May 2007) reports Kenya in talks with COMESA to extend period of import restrictions beyond March 2008 deadline and the Minister for Trade and Industry Mukhisa Kituyi states reforms for efficiencies are on but Kenya will not be able to compete by the end of February 2008. For example, sugar is reportedly costing the manufacturers in Malawi, Sudan, and Mauritius 250 Kenya shillings per tonne as compared to Kenya's range from 400 to 600 shillings per tonne. Kenya Sugar Parliamentary Association has joined the frail to protect the sugar sector asking for another 4 years from COMESA (East African Standard, 29 Mar 2007 and mystocks.co.ke, 04 Sep 2007). The beer wars between our own giant EABL and SAB were a point that alerted Kenyan manufacturers of how hard things can get even with our biggest best (BBC World Service Broadcast, 8 Sep 2000 and IPP Media, 22 May 2002). The major shareholders of cement in East Africa, Lafarge are targeting conglomeration of the big cement firms in fear of penetration of the Asian firms as well as Egypt (East African Weekly, 07 Aug 2007)

2.2.4 Technological Resource Based tools in manufacturing

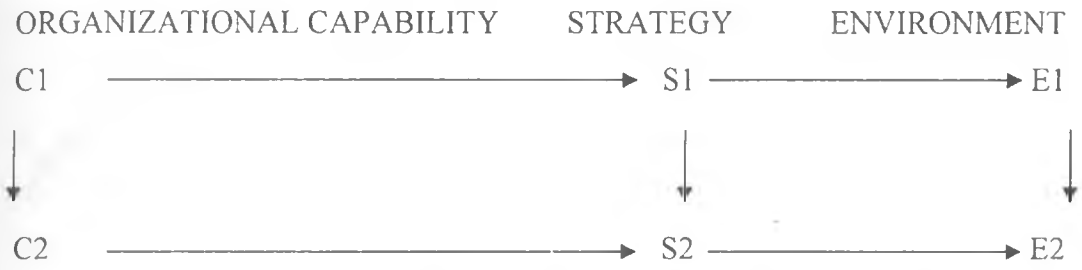
Kaizen which is originally Japanese is a technological system for Continuous Improvement and seeks continual improvement of Machinery, Materials, Men (labor utilization), Money, Mother Nature and Production Methods (6Ms) through applications of suggestions and ideas of company teams. Leong and Ward (1995) look at 6P's of manufacturing as technological resources. Strategic change is a change in a company's strategy, mission, and vision. Cultural change is a change in a company's shared values and aims (Dessler, 2004; Chase et al., 2004; Drury, 2004). While Technological change is

modifications to the work methods an organization uses to accomplish tasks. "The flexibility of the plant depended much more on people than any technical factor, Although high levels of computer integration can provide critically needed advantages in quality and cost effectiveness, operational flexibility is determined primarily by a plant's operators and the extent to which managers cultivate, measure, and communicate with them" reports an expert after studying a huge new computerized paper production process at Mead Corporation's Escanaba Michigan plant (Dessler, 2004).

2.2.5 Aligning Technological Resources to Strategy

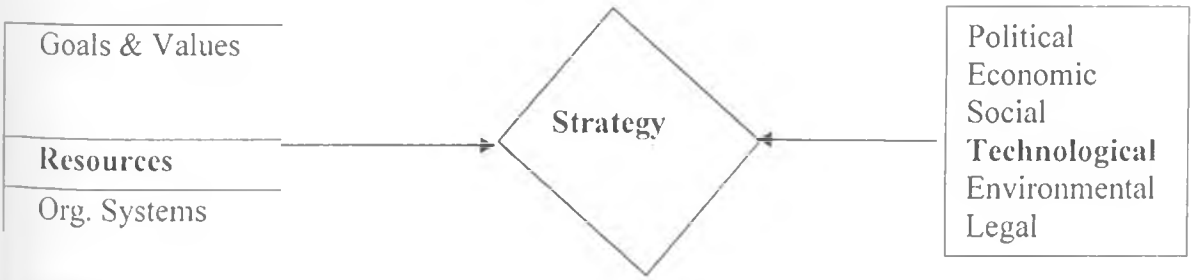
Strategic aggressiveness must be appropriate for each level of environmental turbulence. Organizational capability must be appropriate for each level of strategic aggressiveness. This concurs with Ansoff's model (1990 and 1998).

Fig 2.2 Strategic Alignment



Managing in Turbulent Times – Igor Ansoff's strategic Model 1990, 1998 – Article written in http:www.ansoffasia.com/article002.pdf by Sect Seng Pun, MD of Ansoff Associates (Asia) Pty Ltd

Fig 2.3 Aligning resources, strategy and environment



Johnson, G., et al. (Eds). Exploring Corporate Strategy, p68. Prentice Hall International (UK) Ltd

When the level of environmental turbulence changes, the historical level of organizational ability may become a major obstacle to the organizational ability to adapt to the new challenges (Porter, 1991; Aosa, 1992; Ansoff, 1990; Ansoff, 1998).

2.2.6 Competitive Knowledge as a technological resource

There could be six change initiatives for competitive manufacturing for a company to reach full growth and profit potential. There is a need to improve MRPII/ERP and lean manufacturing results.

The first is Strategic Planning to identify critical success factors for future growth and profits. The second is lean manufacturing: The Japanese used Ford's lean manufacturing basics and Juran's and Deming's Quality and management basics to create the foundation for achieving world class manufacturing. There must be top-to-bottom commitment. The third is Supply Chain Management to get the right parts to the right place at the right time, and the right price. This calls for teamwork with suppliers and customers. The fourth is Kaizen and Performance Management. If the strategic team can handle only one initiative at a time, then it should be a "quick-hitting" Kaizen and Performance Management Program. It takes Kaizen and Performance Management to win each of the battles along the way to win the war in financial numbers. The fifth is Total Quality Management – ISO 9000:2000. ISO 9000:2000 (2008) compliance is sufficient for most customers (not necessarily certified) for improving quality and customer satisfaction. The last is Lean Sigma, a continuous improvement methodology for leading edge manufacturers, to help the company to create and implement a winning strategy, improve customer satisfaction, develop motivational performance measurement, speed improvements in quality, time and cost reductions, eliminate day-to-day chaos and end-of-month scrambling and then, reach a company's full growth and earnings' potential (Schneiderman, 2001; Gaw, 2007; Amolo, 2002; Blaine, 1991; Benjaafar & Ramakrishnan 1995; Boaden, 1996; Kiruthu, 1994; Munyiri, 2000; Ombura, 2003; Omiti, 2003; Schonberger, 1986).

2.3 Robert M. Grant Model of Resource Capabilities

2.3.1 Taking Stock of the Firm's Resources

Resources are inputs into the production process - they are basic units of analysis, capital equipment, skills of individual employees, patents, brand names, finance and so on. Productive activity requires the cooperation and coordination of teams of resources.

Resources are the source of a firm's capabilities; capabilities are the main sources of its competitive advantage (Mapes and New, 1997; Dostaler, 2000; Da Silviera, 2001).

2.3.2 Resources as the basis of Profitability – Robert Grant

Grant (2001) illustrates how resources are identified which result in capabilities, which give rise to competitive advantage from which strategy is formulated that best exploits the organizational resources and capabilities in relation with the external opportunities. In this study the concern is in the lower half of the illustration (Grant, 2001) where technological resources influence outputs through resulting capabilities and competitive advantage.

One should ask what opportunities exist for economizing on the use of resources. The answer is to maximize productivity in plant machinery, finance and people. Using fewer resources to support a larger volume of business upon expertise in rigorously pruning the financial, physical and human assets needed to support the volume of business in acquired companies. Then what are the possibilities for using existing assets more intensely and in more profitable employment? A large proportion of corporate acquisitions are motivated by the belief that the resources of the acquired company can be put to more profitable returns. Returns from transferring assets into more productive employment can be substantial (Lutta, 2003; Motari, 2003; and Kirui, 1999).

2.4 Technological Capabilities as Organizational Routines

Capabilities involve complex patterns of coordination between people and other sources. Perfecting such coordination requires learning through repetition.

2.4.1 Economic Experience

The advantage of an advanced firm over a newcomer is primarily in the organizational routines that it has perfected over time. The Boston Consulting Group's "experience curve represents the naive, yet valuable attempt to relate the experience of the firm to its performance. However in industries where technological change is rapid, new firms may possess an advantage over established firms through their potential for faster learning of

new routines because they are less committed to old routines (Gagnon, 1999; Stark, 1988; Skinner, 1984).

2.4.2 The complexity of capabilities

A key feature of industrial markets is the existence of committed competition - rivalrous moves among incumbent procedures that involve resource commitments that are irrevocable for non-trivial periods of time. Important determinants of the sustainability of competitive advantage: durability, transparency, transferability, and replicability (Pedler et al., 2000; Haksever et al., 2000; Kibe, 2000).

2.4.3 Durability

The increasing pace of technological change is shortening the useful life spans of most capital equipment and technological resources (Gagnon, 1999).

2.4.4 Technological Reputation

Both brand and corporate e.g. Heinz sauces, Kellogg's cereals Campbell's soup, Hoover vacuum cleaners have been market leaders for close to a century. The reputations of GE, IBM, Du Pont, and Proctor and Gamble as well managed socially responsible, financially sound companies, which produce reliable products and treat their employees well has been established over several decades. While increasing environmental turbulence shortens the life span of many resources it is possible that it may have the effect of bolstering brand and corporate reputations (Kabur, 2002; Gagnon, 1999).

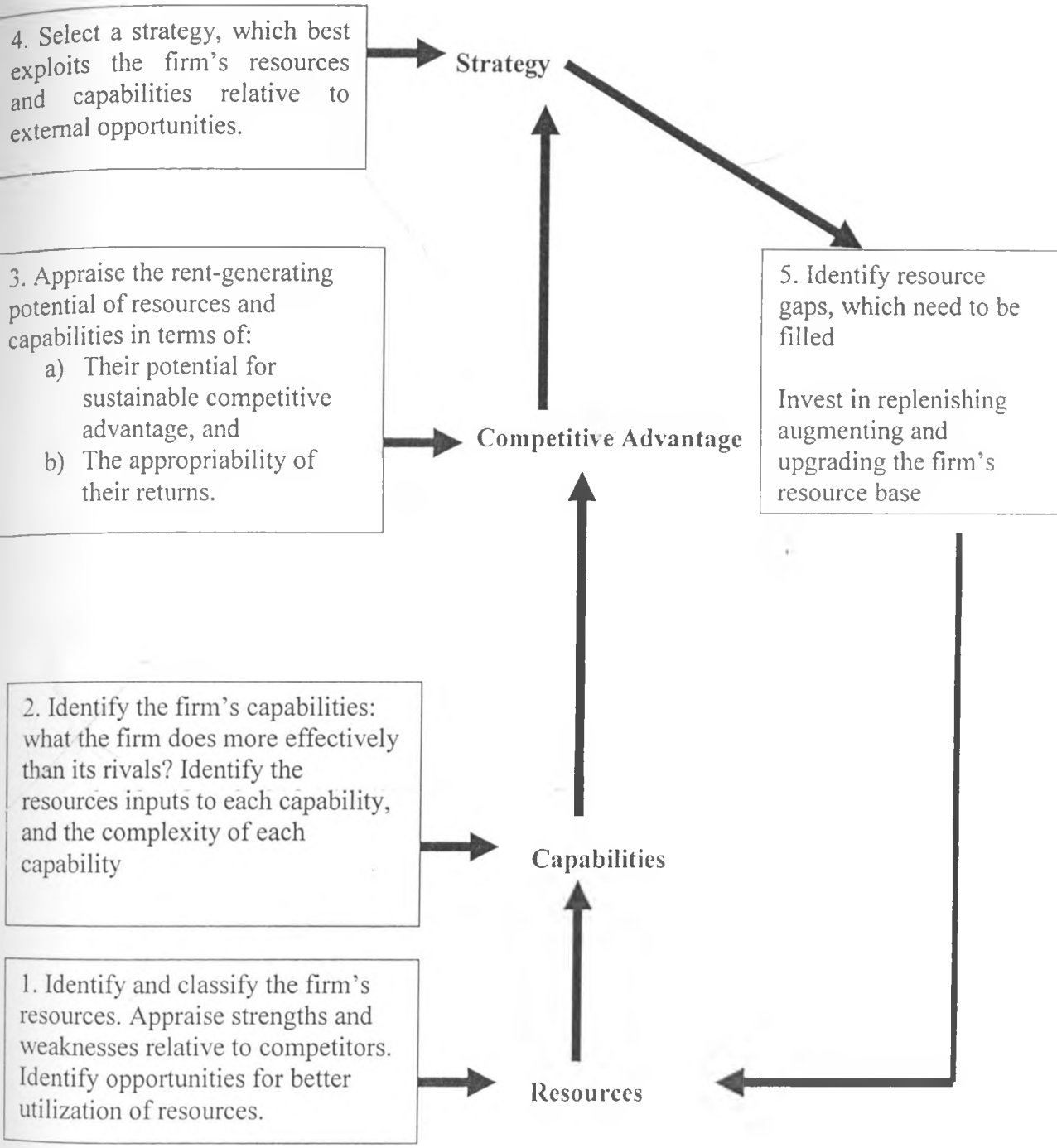
Firm capabilities have the potential to be more durable than the resources upon which they are based because of the firm's ability to maintain capabilities through replacing individual resources (including people) as they wear out or move on. Management of these capabilities is to ensure their maintenance and renewal. One of the most important roles that organizational culture plays in sustaining competitive advantage may be through its maintenance and support for capabilities through the socialization of new employees (Pedler et al., 2000).

2.4.5 Technological Resources Transparency

What is the competitive advantage of the successful rival and how is it being achieved? And how can the would-be-competitor amass the resources and capabilities required to imitate the successful strategy of the rival? If the firm wishes to imitate the strategy of a rival, it must first establish the capabilities, which underlie the rival's competitive advantage, and then it must determine what resources are required to replicate these capabilities. This Is the" transparency "of competitive advantage which is the consequence of superior capability in relation to a single performance across several variables. Cray research success in the computer industry bases on its technological capability in relation to large, ultra powerful computers. IBM's superior performance is multi dimensional and is more difficult to understand. It is extremely difficult to distinguish and appraise the relative contributions to IBM's success of research capability, scale economies in product development and manufacturing, self capability, self-sufficiency through backward integration, and superior customer service through excellence in sales, service, and technical support (Grant, 2001).

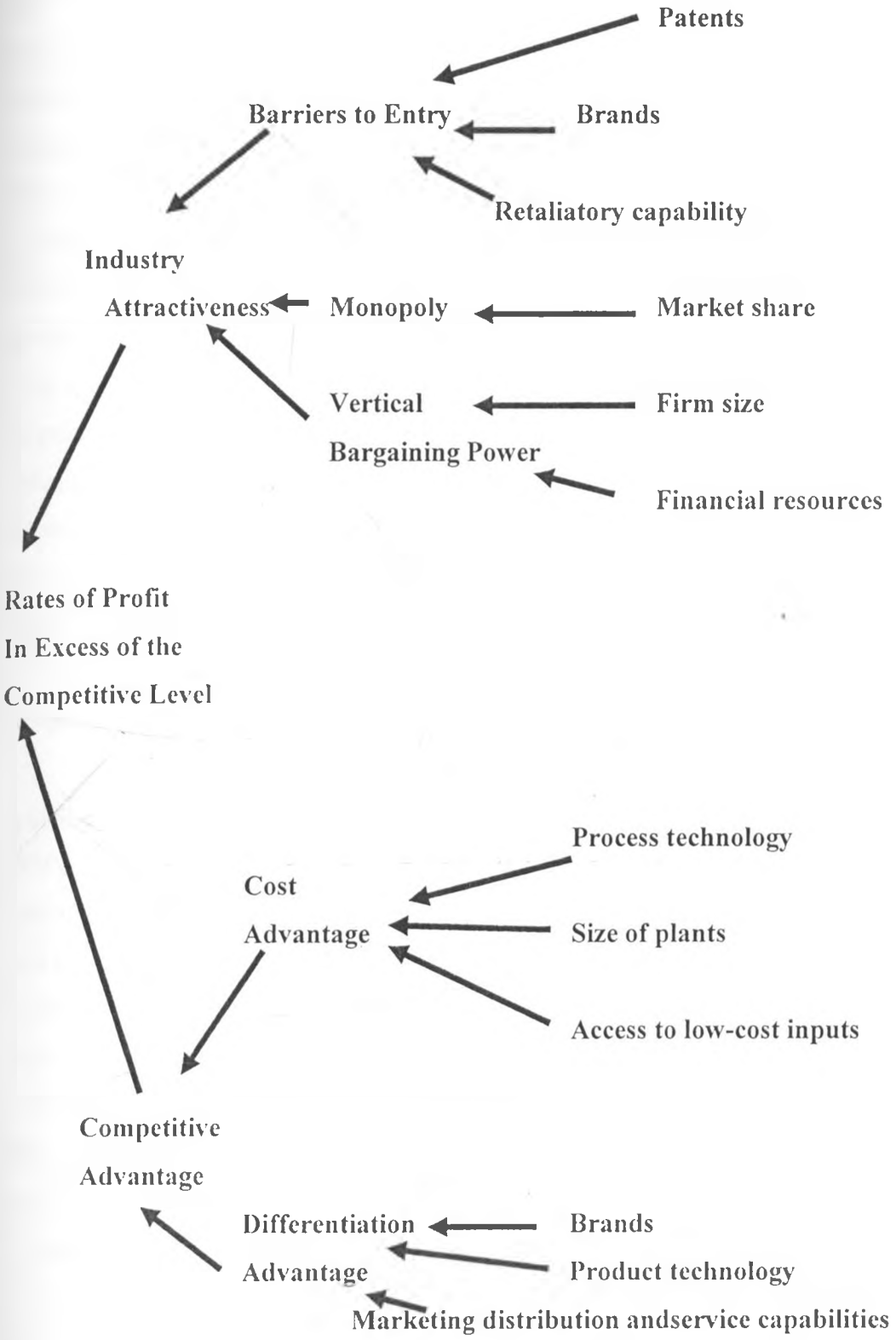
With regard to the second transparency problem, a capability, which requires a complex pattern of coordination between large numbers of diverse resources, is more difficult to comprehend than a capability, which rests upon the exploitation of a single dominant resource. For example Federal Express' next day delivery vans, computerized tracking facilities, and automated sorting equipment, all coordinated into a single system. By contrast, Atlantic Richfield's low cost position in the California market rests simply on its access to Alaskan crude oil. Imperfect transparency is the basis for Lippman and within a market over how successful companies "do it," the more inhibited are potential entrants, and the higher the level of profit that established firms can maintain within that market (Grant, 2001).

Figure 2.4: A Resource Based Approach to strategy Analysis: A Practical Framework



Grant, R.M. (2001). The Resource-Based Theory of Competitive Advantage: Implications for Strategy Formulation. California Management Review Vol 33 No. 3, pp 125

FIG 2.5: Resources as the basis of profitability



Grant, R.M. (2001). The Resource-Based Theory of Competitive Advantage: Implications for Strategy Formulation. *California Management Review Vol 33 No. 3, p134*

2.4.6 Technological Transferability

Most resources and capabilities are not freely transferable between firms; imperfections in transferability arise from several sources. The first is Geographical immobility. The second is imperfect information. There is heterogeneity of resources (particularly human resources) and by imperfect knowledge of the potential productivity of individual resources. The established firm's ability to build up information over time about the productivity of its resources gives it superior knowledge to that of any prospective purchaser of the resources in question. Imperfection of the markets for productive resources result in winners under priced, thus profitability between firms. The third is Firm specific resources. The value of a resource may fall on transfer due to a decline in its productivity. A change in ownership of the brand name erodes its value. Rover, MG, Triumph, and Jaguar were merged into British Leyland of these brands in differentiating automobiles declined substantially. Some resources may be almost entirely firm specific. The last is the immobility of capabilities. Capabilities, because they require interactive teams of resources, are far more immobile than individual resources require the transfer of the team. Such transfers can occur for example the defection of 16 of the Boston mergers and acquiring staff to Wasserstein Perell and Company (Pedler et al, 2000).

2.4.7 Technological Replicability

IBM's ability to motivate its people and Nucor's outstanding efficiency and flexibility in steel manufactures are combination of complex routines that are based upon tacit rather than codified knowledge and are fused into the respective corporate cultures. The second is just in time scheduling and quality circles. The corporation and attitudinal changes required for their effective operation are such that few American and European firms have introduced either with the degree of success as Japanese companies. Xerox's to customer service is a capability that is not located in any particular department but it permeates the whole corporation and into the fabric and culture of the corporation. Replication is possible; the dynamics of stock–flow relationships may still offer an advantage to incumbent firms. Competitive advantage depends upon the stock of resources and capabilities that asset mass efficiency. The initial amount of the resources which the firm possesses influences the pace at which the resource can be accumulated and time compression diseconomies – firms which rapidly accumulate a resource incur

disproportionate costs (crash programs) of R & D and blitz advertising campaigns (Grant, 2001).

2.4.8 Technological Appropriability

Employee ability means that it is risky for a firm's strategy to be dependant upon the specific skills of a few key employees. Also such employees can bargain with the firm to appropriate the major part of their contribution to value added. The ability of IBM to utilize its advanced semiconductor research as instrument of competitive advantage depends, in part, upon the extent to which the research capability is a team asset rather than a reflection of the contribution of brilliant individuals, stars and in house gurus by engineering a transfer of reputation from these key employees to the company as a whole.

Formulating Strategy rent–generation potential of resources and capabilities concludes that the firm's most important resources and capabilities are those which are durable, difficult to identify and understand, imperfectly transferable not easily replicated, and which the firm possesses clear ownership and control. If a company's resources and capabilities lack durability or are easily transferred or replicated then the company must either adopt a strategy of short-term harvesting or it must invest in developing new sources of competitive advantage. Innovations offer only temporary competitive advantage or the firm must establish the technology capability for a continuing stream of innovations (Pedler et al., 2000; Grant, 2001; Gewal & Tansuhaj, 2000; Gagnon, 1999; Drucker, 1998; Hayes et al., 1998; Bierbuse & Siesfeld, 1997; Hill, 1994; Mintzberg, 1994).

2.5 Advanced Computer Technologies

World-class manufacturing tries to get the best approaches for each of the Operation strategies of quality, cost, speed and flexibility. Advancing among others in computer technologies further enhances this.

2.5.1 Flexible Manufacturing

Globally coordinated flexible manufacturing involves the sourcing of components and sub-assemblies, global distribution into multiple markets, efficient use of global

manufacturing and assembly of parts. This coordinates Production Planning and Scheduling among multiple plants in many countries and across production lines.

2.5.2 Automation and Centralized Production

Automation is the interlocking of machines performing different functions, while Centralized Production is the production controlled from one point by use of Information and Communications technology, facilitated by Programmable Logic Controllers (PLCs)

2.5.3 Computer Aided Design (CAD) and Computerized Numerical Centers (CNC)

CAD aids in the speed of drawing and design manipulation, modification with which these can be analyzed giving faster decision making and accurate flow of information (Heizer, 1995 and Mwangi, 2002). AutoCAD and ArchiCAD are used in Engineering and Architectural Designs respectively. **Computerized Numerical Centers (CNC)** use magnetic tapes to electronically control machines. Machines are operated using instructions stored on magnetic tapes (Harrison, 1993; Mwangi, 2002). Machines have their own microcomputer and memory to store computer programs.

2.5.4 Computer Aided Manufacturing (CAM) and Computer Integrated Manufacturing (CIM)

CAM is a specialized computer program to direct and control manufacturing equipment (Heizer, 1995; Mwangi, 2002). CIM is Computer programs used in almost all aspects of Production, combining Computer Aided Design and Computer Aided Manufacturing by integration. They are microprocessors-based and all production is regulated from the instructions given to the machines. These are facilitated by systems designed to handle operations. This is through Supervisory Control and Data Acquisition (SCADA) systems that are computer based and are used to network various machines through industrial communication networks. This can then be incorporated to Local Area Networks (LAN), for use in monitoring of operations on the shop floor. MRP is part of the tools used to incorporate the manufacturing activities in the management. It relies on tested best operation practices. Electronic Data Interchange (EDI) is used to link suppliers and manufacturers (Kanioru, 1999).

2.5.5 Computerized Maintenance Management Systems (CMMS)

Following the researcher's 18 years in manufacturing industry, the choice of CMMS depends entirely on one that offers truly user-friendly interface and working system in relation to the other manufacturing and general organization functions. Some of the maintenance management systems that have been in use include Mantland (Spanish), Maximo (French), Maintenance Pro (American) and SAP (German integrated system) among others. This system is used in:

Equipment tracking: Can track unlimited number of equipment using description, make, model, Serial Number, photographs, hours, miles, kilometers, revolutions, gallons, counts, copies, and so on. **Preventive and Repair Maintenance**: Tracking trends, maintenance due notifications in which equipment overdue is shaded in red and maintenance soon-due shaded in yellow. **History Recording:** Evaluating maintenance history of equipment decreases downtime assisting in Root Cause Failure Analyses. Work orders are closed and maintenance recorded for the equipment.

Parts: Part numbers, description, unit costs, vendors, and bar coding can also track parts by scanning UPC symbols and other barcodes. **Work orders:** The system automatically generates work orders. Work orders can also be generated manually. These last two are useful for Reorder notifications, part-association and built-in **Reorder System** (CMMS Directory, 25 Sep 2007).

2.5.6 Measurement of Strategic Alignment

Information and Communications Technology strategy contains the technology scope (what Information Communications Technology creates business opportunity) and the competencies (what Information Communications Technology creates business advantage) and governance (what external relationships does the company depend on).

Level 1: the weakest, without processes and communications needed to attain alignment.

Level 2: Beginning Alignment Process

Level 3: Established the Alignment Process.

Level 4: Have Improved Alignment Process

Level 5: Information and Communications Technology and other business functions (marketing, finance and production among others) adapt their strategies together using fully developed processes. The areas are Communication, Metrics, Governance,

Technology, Human Resources and Partnership (Pearce & Robinson, 2004; Johnson & Scholes, 2002; Kathuria & Partoui, 2000; Hayes et al., 1998; Benjaafar & Ramakrishnan, 1995; Schonberger, 1986)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research Design

This study employed a multiple case study as its research design. This is where more than one case study is involved. In this study, the researcher involved three companies in the survey. A multiple case study enables one to compare the differences in application of a certain phenomena.

3.2 Population

The population involved all large manufacturing firms. The sample involved three companies namely: Mumias Sugar Company Limited, Bamburi Cement Limited and East African Breweries Limited.

The three manufacturing firms are all in Kenya, one in Western Kenya, the other in Nairobi (Central Kenya) and the third one to the East at the Kenyan Coast. The cases of Mumias Sugar Company Limited in Western Kenya, East African Breweries Limited headquartered in Nairobi Central Kenya and Bamburi Cement Limited, Mombasa Plant in the Kenya Coast Region, Athi River, and West Uganda being headquartered in Nairobi.

Typical of the large manufacturing firms in Kenya they have or intend to have subsidiaries all over East Africa. These firms are considered by Kenyan standards large as the invested capital and turnover are in excess of twenty billion Kenya shillings (NSE, 2007) and they are forces to reckon with in the East African region, perennial Company of the Year Award (COYA) winners in the last seven years in one field or the other (Pricewaterhouse Coopers, 2006/2007).

The three are listed under Industrial & Allied category at NSE, but geographically varying and the resources differing right from inputs through transformation to outputs. As manufacturing firms similarities and disparities were apparent during the study. Mumias and EABL have input materials from Agricultural farms while Bamburi Cement Ltd has input materials from rock mining.

3.3 Data Collection Method

A semi-structured questionnaire was designed and used for the case study of the technological resources. Direct contacts were used to collect primary and secondary data. Primary data was mainly from the questionnaire. Telephone and email communications were used to cover for any shortcoming that would not adequately get covered by the questionnaire. Direct contacts with key personnel operational and factory equipment and other resources were made during factory familiarization visits.

Questionnaires were to be directed to the chief executive officer, heads of operations and other relevant departments for the input, transitional and output technological resources. Interviews on focused groups were carried out to establish the types of technological resources used by the manufacturing firm and their relationships to competitive advantage of the firm.

3.4 Data Analysis

Content analysis was the most appropriate to be used on the data in dealing with diverse array of answers from various respondents and because of open-ended questions. Harold Laswell (1935) formulated the core questions of content analysis: "Who says what, to whom, to what extent and with what effect?" Holsti (1969) describes content analysis as any technique for making inferences for making by objectively and systematically identifying specified characteristics of messages.

The method of content analysis enables the researcher to include large amounts of textual information and systematically identify its properties, for example frequencies of most key words "Key Word in Context" (KWIC) – to inform data analysis, providing at the end a meaningful reading of content under scrutiny.

The analysis was twin-pronged. One was qualitative and the other quantitative from value data that will complement each other for inferences to be drawn. Future trends could be deduced from the quantitative data by way of charts, trend lines and graphs (Naisbitt, 1982). For a correct content analysis six questions must be answered:

- Which data are analyzed? Qualitative and quantitative.
- How are they defined? Primary and secondary data.
- What is the population from which they are drawn? 5 to 10 Heads of department for each manufacturing company interviewed.
- What is the context to which data is analyzed? Large manufacturing firms; East African Breweries Limited, Bamburi Cement Limited, and Mumias Sugar Company Limited.
- What are the boundaries of the analysts? The objectives of the research.
- What is the target of the inferences? Technological resources for sustainable competitive advantage (Krippendorf, 1980 & 2004).

By the hypothesis of Mimetic Convergence, respondents tend to converge in the direction of uniform positions in most thematic dimensions. For evaluation that is based on knowledge, this would be quasi-evaluation. However, based on availed values of data, there are also real evaluations (Frisbie, 1986).

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSSION

4.0 Introduction

This chapter presents the analysis and the findings of the study. The data is summarized and presented in form of tables to highlight the major findings. They are also presented sequentially according to the research questionnaire. Discussions include main challenges faced as well as successes. The research question is that of technological resource based approach, if used at the manufacturing companies under study.

4.1 Company Background information

4.1.1 Respondents

Questionnaire respondents were from the three companies: Five respondents from Bamburi Cement Limited, two from Mumias Sugar Company Limited and one from East African Breweries Limited. Several Heads of departments had already been interviewed earlier in the familiarization visits and provided further backup information.

Key personnel answered questions appertaining to technological resources used for sustainable competitive advantage. The education of the respondents ranged from diploma holders to a postgraduate Masters Degree holder. There was a Human Resources officer, mid-level Technical services Trainer, two Production Managers, a Logistics Manager who has been a Production chief before, an Optimization manager and an Operations Director.

4.1.2 Company Ownership

In this section, the researcher sought to find out the ownership of the companies involved in the survey. The results showed Bamburi Cement Ltd and East African Breweries Ltd are both foreign and locally owned while Mumias is locally owned. Bamburi Cement Limited is largely owned by Lafarge Corporation at 73% stake holding, the balance 27 % is owned through NSE listing. This has capacity to produce cement in to the market of 2.3m tonnes per year from its two plants in Mombasa and Athi River near Nairobi. Nairobi does 1.2m. Clinkering is done in the Mombasa Plant. 90% of the raw materials are the coral limestone owned by the company and the factory was strategically located

on this coral limestone site by the founder Dr. Felix Mandl in 1951 started with 140,000 tonnes cement per year in 1954 at its Mombasa Plant.

Mumias Sugar Company Limited is a listed company and initially co-owned between the Government and Booker Tate International as managing agents, together with the financiers ICDC, ADB, etc. This changed hands about 7 years ago in 2001, when Mumias became locally managed and opened its doors to local investors by listing on the NSE. The first Kenyan Managing Director was appointed in 2003. Farmers, employees and general public own shares in this company. Like Bamburi and EABL, it is listed under Industrial & Allied, in what are called the blue chips. The company was incorporated in 1971 and by 1979 production had more than doubled. The company is the king blue chip in the Western Region of Kenya.

EABL has six subsidiaries: Kenya Breweries Limited (KBL), Central Glass Industries (CGI), United Distillers Vintage (UDV) Kenya for wines and hot drinks, East African Malting, Uganda Breweries Limited (UBL), and International Distillers Uganda. EABL has also 20% shares in Tanzanian Breweries owned by Castle Breweries of South Africa, a convenient arrangement reached at some three years ago to water down the beer wars at the onset of the new millennium in Kenya, since the latter also has 20% shares of EABL.

The company is listed with 362,959,275 ordinary shares of par value 5.00KES. Its market capitalization is KES 71.50 billion. It reported Earnings Per Share (EPS) = 7.20 KES, Dividends per share (DPS) = 5.50 KES, Price per Earnings ratio (P/E=27.36), Price – 197 KES, Dividend Yield = 2.79% (NSE report of 02 October 2007). Bamburi does not have a real challenge from the competitors, except they have a difficult period dealing with enthusiastic Asian investors, who are continuing to grow in to the market and from time to time are ready to play politics. By 2008 Bamburi controlled 66% of the market, followed by East African Portland Cement Ltd (EAPCL) with 27% and Athi River Mining (ARM) had grown to 7%. Another Cement Plant erected in Kilifi District of the Kenya Coast by the Asian owners of Tororo Cement in East Uganda, was due to be in full production soon. Bamburi Cement has subsidiaries in Hima Cement in West Uganda, Lafarge Ecosystems in its reclaimed quarries, Mbeya Cement in Southern Tanzania and

Bamburi Special Products in Nairobi for building materials. Bamburi also had 41% shares of the EAPCL and 15% of the ARM.

4.1.3: Market for the company

Given that companies target their markets either abroad or locally, the researcher sought to find out the market for those involved; and all the companies in the study indicated that they targeted their products both for the local market as well as foreign market. By virtue of its original location, Bamburi was aimed at exporting only. However with stiff global competition, the local market turned more lucrative and attractive to hold and by 2008 the local/export sales ratio had gone up to 85/15. Compare this to earlier ratios of 1998 at 71/29 and in 1999 at 72/28.

4.2: Manufacturing process Technological Resources base

There are various ways of classifying manufacturing processes. In this category, the study sought to establish the manufacturing processes for the companies involved in the study. The results by all the respondents showed the manufacturing processes are both automated and computerized with one Centralized Control Room.

4.2.1: Technological investment

The respondents were asked to state an amount that best described the technological investment for the company. The results from respondents varied slightly based on their knowledge of their companies.

On technological investment, one respondent said this was over 25billion Kenya shillings, two suggested 5 to 15 billion and one said it is up to 5 billion. NSF report of 18 October 2007 has figures of KES 6.7 billion as the technological investment Bamburi under the Lafarge banner is putting in Hima Cement alone. With Market capitalization at KES 71.5 billion, most of the investment is in the newer technology in equipment and trained skills. From the "Kenya Cement wars" article in the African Business Review of 20 August 2007 and the East African Standard of 21 August 2007, the Managing Director of Bamburi, Michel Puchekos reported that the company was ready to invest $250m (KES18 billion) in Kitui, Kenya, showing that the company was ready to make new investment of KES 25 billion at ago in both Kenya and Ugandu.

4.2.2: Introduction of new products

This section was meant to determine the frequency with which new products would be developed for the market. The results from the respondents showed that new products were developed as per the demand one hand as well as developed annually on the other hand with equal emphasis.

4.2.3: Operations strategy and long-term business objective

In this part, the respondents were asked to state whether the company considered manufacturing/operations strategy as enhancing long-term business performance and success. All the respondents agreed that manufacturing strategy was considered as enhancing the long-term business objectives.

4.2.4: Importance of Operations Strategy with technological resources

In this category, the researcher sought to find the importance attached to various technological factors of operation strategy. The results showed the majority attached very high importance to quality of product, followed by cost, innovativeness, time/speed and flexibility in that order. EABL and one Mumias respondent attached equal importance to all these five operation strategies. One respondent from Bamburi added safety attached to very high importance. EABL had also safety but added environment and corporate social responsibility with equally very high importance. One Mumias respondent attached least importance to quality followed by cost, time/speed and innovations in that order.

4.2.5: Reason for inclusion in operations strategy

The question posed here to the respondents was the reason for the inclusion of various factors as part of the operation strategy. EABL, Mumias and majority of Bamburi respondents gave the reason for quality being customer focus. Respondents from Bamburi added safety performance due to cement being a major component in the strength of structures in construction and could cause catastrophic failures if not correctly observed and would completely destroy the company's market and increase insurance levies after compensation claims.

Cost was determined by the low cost strategy to afford to sell cheaper than rivals, offering lower prices to target markets or sell at the same price with more profitability for

growth and development. Improved flexibility for EABL is important in their equipment as they produce very many brands, cans, bottles, raw materials and sizes, a variation of more than twenty combinations. Mumias' flexibility was satisfying customer demand and competitiveness.

4.3 Challenges in implementing an effective manufacturing strategy with available Technological Resources

4.3.1 Quality

The researcher sought to find out from the respondents the problems in setting up and implementing an effective manufacturing strategy using the available technological resources. The responses were varied and included: quality of products in which there was non-uniform material mined at Bamburi and some additives brought by different suppliers, chemists have to blend in "sweeteners" or appropriate mixes. Increased quality measures result in higher production costs. And yet to maintain customers it is compelling and good for them to know that your system ensures the consistency they require.

Mumias suffers from altitude problem and therefore more costs will be incurred for change and skills training and concurs on higher costs due to quality control. EABL suffers power interruptions, scheduled and unscheduled, during the processes that demand strict temperature and time controls for consistency as well and product variety.

4.3.2 Costs

Kenya is high cost cement and sugar producer partly due to high power costs, exorbitant freight charges, high fuel costs and inefficient rail system. All the three companies have thermal processes which when power-interrupted result in extra costs to stabilize the systems for continued production. There was this issue of rival imports at lower costs always threatening to come in hence the companies must be world class in their production processes to compete internationally.

4.3.3 Flexibility

Challenges in maintaining flexibility was because of the different demands from various customers. Many turnkey projects approach Bamburi to supply cement of a standard of the donor country. When the cement specifications are different, it means that even methods of strength testing are different. It takes an effort to satisfy a customer demanding assurance that the methods available in Bamburi laboratories and their testing skills are to their expectations. Before the first delivery is made a lot of effort and time had to be wasted. The next customer may have varied requirements. To circumvent this problem, Bamburi has patented several grades of cement it produces to both local and international standards of specifications.

4.3.4 Time/Speed

Poor infrastructure was picked up by both Bamburi and EABL. Bamburi found out that inertia to change has to be managed and also experienced compromises to safety in the process of achieving this strategy. Mumias experienced unexpected machine failures, external forces and in-built inefficiencies. Mumias needed to have in place condition-based monitoring online equipment in place in their technological advancement. This Computerized Maintenance Management Systems would lead to pro-activeness and predictability of the plant. In the absence of this, it is difficult to know which equipment should be repaired, replaced or upgraded. EABL experiences long distances to cover the East African Region as a real challenge as they strive to reach all their customers. The companies try to outsource logistical support while concentrating on their core-businesses.

4.3.5 Innovativeness

Bamburi respondents felt this helps to fail in achieving quality standards as enthusiasts push to try their ideas, and that sold out market is quite demanding. They have experienced very high costs of industrial trials. There is not yet a stable structure or system to capture innovative ideas. This means that there are very many innovative ideas that will never have a chance, while some not so well-thought out will get a chance to be implemented and only to produce intangible results or introduce new problems.

There is also failure if an innovator of good ideas he leaves the company and many others remaining not willing to see the innovation through to fruitful completion. It is possible that EABL went through this cycle already and have circumvented it creating a team, Profitability Improvement Projects (PIP's). Issues are better dealt with in a team rather than individual-orientation.

Bamburi experienced problems bringing the contractors to their level of company standards. It is with this in mind that EABL set up a separate team with Procurement to be responsible for nurturing their suppliers to the level of performance to a mutual beneficiality with the company. After all, most of those contracted have been either employees of the same firm or similar firm and employed trainable personnel by virtue of the skills they perform.

4.3.6 Others

EABL has had problems with taxes to consider in excelling in innovation.

4.4: Strengths in the operational Technological resource priorities

The study had to find out the strengths in the operational resource priorities for the companies involved in the survey. Bamburi respondents felt the highly skilled manpower, highly automated technology laboratories and culture of excellence is the backbone for the quality of their products. Mumias respondents thought their strength was high quality of the products, continuous improvement and Quality Management System ISO 9001:2000 which they had embraced. EABL was proud and confident to nurture the top Quality Management Systems and complied with ISO 9001:2000, HACCP, ISO 14001:2000 for Environment management and OHSA 18001 for health and safety management, in-built quality monitoring system and set aside Quality department attached to the Chemical processes.

4.4.1 Effectiveness of operation strategy

In this category, the idea was to find out the means by which the companies involved in the survey evaluated the effectiveness of operations strategy. Respondents from Bamburi suggested the greatest effect on cost strategy has been the effective use of alternative

fuels of which some cost almost nil save for the transportation costs e.g. coffee husks, coconut husks and used rubber tyres. Another respondent still from Bamburi did mention the increased number of plants in the region and that their effective logistical system allows them flexibility to respond to demand changes.

Both Mumias and EABL said SAP technology is in place. EABL has enhanced the amalgamation of manufacturing to the other functions of maintenance, procurement, accounting, demand solutions, cost improvement projects and have channeled projects to Profits Improvement Projects (PIPS) as a function within the management groups. EABL has Excel fleet management and strategically placed depots. The major overseas distributors guarantee availability of the EABL beers, at least the lead brand.

4.4.2 Frequency of review of operations strategies relating to technological resources

The respondents were asked the frequency at which the company reviewed its operation strategies. The results showed that the frequency of reviewing operations varied from quarterly, semi-annually and annually.

4.4.3: Operations strategy process using technological resources

In this section, the researcher was interested in knowing the officers involved in the operation strategy process, in managing the technological resources effectively.

Bamburi and EABL involved heads of department who are basically functional heads. EABL mentions Technical Services team in liaison with marketing; this implies they are right into the Manufacturing strategy in its pure form. Operations teams in all the three companies do implementation. Marketing and Quality departments at EABL do evaluation. At Mumias, the Executive Management Committee and External Auditor do the job. Its past relationship with the Government and the way things are done still linger on. Ways are more related to Public Accountability procedures practiced in Parastatals and Government Agencies.

4.4.4: Customer and supplier involvement in the design process

This section was intended to find out the level of involvement of customers and suppliers in the design process and how the technological resources are affected by this relationship. The results showed that these three companies value customer's input in the product design process. Only one respondent was oddly out that customer involvement was passive in the designing process. They have also been working between actively and very actively with suppliers. EABL and Mumias respondents suggested they have close communications with suppliers at all times. All agreed that customers had given feedback very frequently. The major focuses for Bamburi are contractors, individual businessmen/ women. All three companies focus on individual businessmen/women. Mumias' other focus is medium to lower salaried employees.

4.4.5: Technological communication

This section was focused in finding out the main means with which the company communicated with its employees to assess the technological resources used in this important organizational function. The findings received showed most of the time internal mail (intranet) was the medium the companies use for notifying employees of impending changes, followed by internal mail (manual), noticeboard memo, newspapers, TV and radio inthat order. EABL put staff briefing as most used as it is for internal mails (intrunet and manual).

4.4.6: Company's goals

The participants were required to list the priority of the company's goals from a list provided to them This could relate to the technological resources they would use to achieve their goals. The results showed that growth and profitability had high scores by all respondents as the goals for their companies. However for Mumias Sugar had a high scores on survival strategy. This may have been due to the COMESA talk of market freedom.

4.4.7: Strategic management impact on employees

The researcher sought how employees were impacted by strategic management change. The idea was to see how companies use their technological advances in relation to their

employees, considering that technical skills acquired blend into technological resources. The result brought to the fore the facts that Strategic management change's greatest impact was layoffs by both Bamburi and EABL. Respondents from Bamburi Cement thought that there was a balance on allocations to new work, assignment to other stations and layoffs. However Mumias Sugar respondents felt that the impact was assignment to other duties. It is understandable that Mumias is doing this exercise almost a decade after the other two carried out theirs. There is a modified approach to Restructuring and companies following the Resource Based View do not simply see Strategic Management Change as down-sizing. EABL's case was selective layoffs, in that the level of skills and knowledge component was priority for retention. New employees at EABL require a minimum diploma qualification in the relevant field for which the employment is sought.

4.4.8: Technological resources in line with manufacturing strategy

In this category, the respondents were required to state the level of technological improvements on various aspects of manufacturing and production. The respondents were also required to state the level of technology as compared to their competitors. The results were that all the three companies reported technological improvements in all enlisted areas since embracing Manufacturing Strategy. The areas include; on time production, shipping, reduced defect rates and work stoppages, productivity, overall profitability and plant reliability. There is consistency in what has been dissected so far about the three companies. However Mumias is still evolving towards this direction behind the leaders. EABL reported having patented equipment and processes which have been able to make them gain competitive advantage. EABL respondents and Mumias respondents saw their process technologies as superior in the region. Bamburi respondents considered their company's technology superior in Kenya, more than average in the region and average or equal to competition globally regionally and globally. For EABL they considered their technology average or equal to competition globally.

4.4.9: Effect on Patented Equipment and Processes

The participants were required to state the effect of patented equipment and processes, in their respective companies for a period of between 2 to 5 years. From the feedback,

respondents were split between agreeing and being neutral that the patented equipment and processes had an impact on manufacturing cost. The same was reported on the effect of patented equipment on wastages, on-time deliveries to customers, receipt of raw materials as well as on production facility.

4.4.10: Competition

In this section, the respondents were asked to state the level of importance with which they attached various aspects of competition. The researcher also wanted to find out how the participants would want to rate competitors on various aspects. The results, summarizing the level of attachment of various aspects of competition the companies involved in the survey had. Those that were considered to be of great impact as responded to by a large number of participants include: technological advancements, new competitors, increased customer sophistication, and infrastructure.

In associated results for rating competitors, the only attribute that majority of the participants rated as being strong among competitors were pricing. Product quality and product diversity was rated as being very strong too as was growth potential and location were rated as strong.

4.4.11 Technological Resources against rivals

The researcher was interested in finding out the technological resources that the companies involved in the study had over their competitors. For Bamburi, it was clear the technological resources that contribute to distinctive capabilities to generate economic rent against the rivalry has been in the computerization of the process and the centralization of the controls by use of artificial intelligence in manufacture, quality control equipment, modern Supervisory Control and Data Acquisition (SCADA) systems. This raises the bar in skills training to man the new systems, networking within a larger family of number one cement maker worldwide and exposure to tried systems before adoption and continuous upgrading to latest technologies with a proactive outlook to these emerging new technologies. Respondents at Mumias Sugar pointed out their distinctive capabilities against rivals to extraction system in their sugar refining process,

several innovations done while most of their competitors were static, human resource skills levels are way above local competition.

For EABL, state of the art production equipment was synergistically combined with economic experience of 85 years, quality, safety, environmental hazards analysis international management systems. This adopted and coupled with firm and fair human skills recruitment and training and culture of one family approach to work had the potential to lift it further into the international arena: and be recognized as one of the best run companies on the globe. The company has a strategic partner in Diageo PLC, the No.1 Beer maker worldwide, which also owns Guinness worldwide.

4.4.12 Implementation of Enterprise Resources Progamme (ERP)

First, the study sought to find out the ERP solutions implemented by the companies involved in the survey. Then, the researcher sought to find out the reasons that justified the implementation of ERP for the companies involved in the survey. The results showed that all of the companies involved in the survey were using SAP but EABL was the one that had adopted it fully. For Bamburi and Mumias they had not yet fully adopted SAP but were mixing with Oracle Financials (Finance) and Maximo (Maintenance). Cohesion therefore was not yet fully achieved for the ERP in these two.

To better manage information resources, support for competitive advantage, innovative ways of doing business, criticality to operations and overwhelming benefits from the system were the main reasons for adoption of ERP. One Mumias respondent felt that the company did it because a competitor had done it. Again, here the respondent had the global world-class competitor in mind.

4.4.13: Capability Maturity Model of the Technological resources

Capability maturity model is a scale for assessing the degree of built-in documentation and discipline in a process, in which the scale goes from Level 1, with no formal process, to Level 5, with a continuous, rigorous and self-improving process. The participants in the survey were asked to assess the level at which their organization lay.

The respondents were split halfway in ranking their companies in the Capability Maturity Model (CMM) for built-in documentation and discipline into the process. Bamburi Cement respondents except one ranked the company at level 4 on a scale of 5 for continuous, rigorous and self-improving process. Mumias Sugar respondents ranked the company at level 4. EABL was ranked at level 5 meaning that its operations were at par with world class companies.

4.4.14: Computerized Maintenance Management System

The participants were asked to state the computerized maintenance management system their companies had adopted. The respondents were also asked to state the frequency of use of various computerization methods. Half of the participants mentioned Maximo as the computerized maintenance management system adopted, some mentioned SAP while a few of the participants mentioned that a combination of SAP and Maximo had been adopted. The other half of the respondents agreed that flexible manufacturing had been adapted to moderate level. For automation and centralized production, the majority suggested that this had been adapted to a very high degree. CAD and CNC were adapted to a moderate level as cited to by 80% of the respondents. Depending on the company, CAD and CIM were adopted to various degrees while CMMS was implemented to a high level.

For Mumias Sugar, the technology adopted was the Extraction system in their sugar refining process, several innovations done while most of their competitors were static and human resource skills levels are way above local competition.

Automation/computerized production has caught fully in all the three companies. For Mumias, the support processes are not automated. Low in use is CAD and CNC, but that could be outsourced. However, when Numerical Machining Complex went down, thanks state mismanagement, this is an area that the whole country is lacking and lagging behind. This would go a long way to reduce the cost of production consumables. The equipment recently purchased and installed has shown that at a faster decision making management, profitability and faster growth can be enhanced for the grip onto regional market as the region opens up its borders, lest the outsiders come and consume us all.

Computerized Maintenance Management Systems (CMMS) has been successfully used at EABL on plant maintenance and now they are also using Excel fleet management system in Logistical controls and tracking. They started with Maximo and now have fully interfaced to SAP that incorporates the whole business functions for correct inter functional coordination and control. Cost centers easily pick up their costs and user functions are able to plan and work within their allocations. Because it interfaces all the companies functions, rigidity is eliminiated once there are some occessional overshoots from the budgets.

In strategic alignment to Information and Communications Technology (ICT), respondents at Bamburi Cement ranked it at number 5. This means ICT and other functions adopt their strategies using fully developed processes in Communication, metrics, governance, technology, Human Resources and Partnership..

In Advanced Manufacturing Technologies (AMT's), Bamburi and EABL all agreed having automation and Centralized Control Production as well as the CMMS. Respondents at Mumias Sugar said that CMMS was not used at all in Mumias. This falls in line with their comments about equipment or plant unreliability and unexpected breakdowns. CIM and CAM are very much used at EABL.

4.4.15: Measurement of Strategic Alignment to Information & Communications Technology

In this section, the respondents were asked to state the level of information communication technology in their companies. The results showed that more than a half of the respondents mentioned that information and communication technology had been integrated with other business functions such as marketing, finance and production. Others pointed out that the level of information technology was still in the alignment process or in improved alignment process.

4.4.16: Statistical improvement data

Bamburi Cement reported Capacity Utilization Factor (CUF) greater than 95%, while Plant Reliability factor (RF) = 93% against the target of 98%. Energy efficiencies: the critical one is the fuel efficiency; the heat consumption target has a KPI of 830 Kcal/Kg clinker produced. The latest modern plants are doing 730 Kcal/Kg clinker. BCI 5 gave CUF = 94%, RF = 98.5% for the Nairobi Grinding Plant. Combined cement grinding for both Mombasa and Nairobi gives 2.3 million tonnes of cement per annum.

For EABL production and energy usage as well as utilities usage data was kindly provided and MS Excel graphs generated portrayed a very huge improvement and growth at EABL, the beer making plant alone. They won the Most Respectable Company of the Year for five years, 2000 to 2004 in a row before relinquishing the position to Kenya Airways for two years in a row and to Safaricom in 2007. However they won the Most Respectable Company in the Manufacturing Sector for the year 2006 and 2007.

4.5 PART III: RESOURCE BASED VIEW (RBV)

4.5.1 Input Resources

EABL's input resources are managed by Procurement interfacing with suppliers. EABL has a standing contract with barley farmers, a factor which helped it withstand a newcomer in Castle Breweries who had to import all their inputs inclusive of import taxes and associated lead times. This is a resource EABL has and will use to advantage over a long time and should reap economic rent over it.

Mumias has renewable contracts with over 50,000 small scale out grower farmers in the sugar belt that is spanning more than 9 political constituencies (8 in Western Province alone, while some in Siaya in Nyanza Province) represented by more than 9 members of Parliament. The contracts last three to four harvests which range between 54 months to 108 months (9 years). Another competitor cannot easily take these farmers as closest competitors are weak and more unstable. The stable one, Western Sugar Company does not have the crushing capacity. The acreage for Mumias Sugar is big, more than half of Western Province and part of Nyanza province in Siaya. There is room in Mumias adopting faster maturing sugar through manufacturing expansion. The Agriculture

Department manages the Nucleus Estate as well as extension services to the contracted out growers. Mumias has the Procurement team with users reviewing the performance of their suppliers annually and retaining those serving their business in line with the intended outsourcing plus reduced inventory and dead stock.

Bamburi uses Quarry management team together with Logistics interfacing with suppliers for various materials. The bulk is from Bamburi quarries, outsourcing Logistics while managing it by the Logistics Department. Procurement section liaises with user departments for ordering of parts and using Jut in time approach beyond infancy stages. Like EABL, cost centers are applied strictly to control costs of production as planned by the easily available plant history, thanks to the good use of CMMS.

4.5.2 Customer and supplier

All three value customer input in the product design process and value this as a strategic resource. They have also been working actively with suppliers. EABL and Mumias claimed they have close communication with suppliers at all times. They all agreed customers give feedback from time to time that they focus on business men and women. Bamburi focused on contractors. Mumias also focuses on lower and medium salaried employees.

4.5.3 Technological Communication

Majority gave internal mail (intranet) as the mode the company uses to notify employees of impending changes, followed by internal (manual), notice board memo, newspapers, TV and radio in that order. EABL put staff briefing at equally most used as internal mail (intranet and manual).

4.5.4 Growth and profitability

These two had high scores by all respondents as the goals for their companies, except for one from Mumias having survival strategy as the main goal for Mumias. He cannot be doubted when COMESA talk of market freedom is on the lips of all sugar stakeholders in Kenya.

4.5.5 People Resource (HR)

Strategic Management Change's greatest impact was layoffs by both EABL and Bamburi. One respondent from Human Resources Section in Bamburi felt there was balance on allocations to new work, assignments to other stations and layoffs. However in 1996 before the first layoffs in Bamburi Mombasa Plant was alone and had approximately 1000 permanent employees. At the time of this study, the employees in Mombasa Plant, Nairobi Plant and Head office, and any transfers from these to Hima in Uganda and Mbeya in Tanzania were about 350.

Some Mumias respondents thought the greatest impact was assignment to other duties. It is understandable that Mumias did this exercise a decade after the others had done theirs. There is a modified approach to Restructuring and companies following the Resource Based View no longer see Strategic Management Change as downsizing. EABL's case was selective layoffs, in that the level of skills and knowledge was priority for retention. EABI has set minimum entry qualifications for all cadres and skills at diploma certificate. Both EABL and Bamburi are now holding fast on to their human resources and enticing them to remain in the service for as long as possible and introducing goodies of all sorts including lowering the level at which managers are awarded shares at subsidized rates or given soft loans to purchase shares and repay in 5 years. This is to create a sense of belonging and ownership. It has been said that human resource is the greatest asset that is never put in financial statements. It can also be replicated by others. What cannot be replicated is the synergistic combination that gives capabilities of the same individuals in the culture of another firm or other manufacturing resources.

4.5.6 6 P's of Manufacturing are in fact resources

People, Plant, Parts, Planning and control, Processes and Procedures (Leong and Wang, 1995) compares well with Kaizen's 6M: Men, Machinery, Materials, Money, Production Methods and Mother Nature. These six have favored the three manufacturing firms so far, and potential competition is focused on the same six areas.

4.6 Challenges to Resource Based View (RBV)

From the questionnaire feedback in the past 10 to 20 years the greatest challenges have been mostly in the dynamic technological advancements. This was then followed by existing competition, increased customer sophistication, infrastructure, substitute products/services, Government Policy, new competitors and liberalized exchange rates at about equal rankings and concern raised by all respondents.

4.6.1 Corporate image

All three companies had to change their corporate image using their technological resources at a cost in order to survive. Bamburi increased expenditure in Corporate Social Responsibility by sponsoring the Rugby Tournament, greening projects, HIV Aids campaigns, and company open days. The also had to relocate the Head office from the Coast to Nairobi which is closer to the market and political control as opposed to the raw materials. The company was initially set up as a sea export-product manufacturer, but now the main market is both local and inland. They also show more customer focus and emphasis to safety and community concerns.

Mumias changed from Parastatal status to Private Company answerable to ordinary shareholders and focusing on running as business rather than as a Government arm. The transition is a great challenge. They have gone strong on marketing and even packaging brand is superior, with their logo as "Mumias the Natural Sweetness". The logo is painted to all their distributors' and mini-distributors' outlets. They have located their Corporate Office in Nairobi City, the market and political centre of Kenya and the Region. They spread Marketing Department sections to Coast and Nairobi. They also strategically use the Mombasa office to handle faster imports and exports through the Kilindini Port of Mombasa.

For EABL to look East African they changed to "One company, One culture" advertisement from the previous "Bia Yangu, Nchi Yangu" (My beer, my Country) for their lead brand Tusker. EABL found out that the best way to fight a giant like SAB Miller that came with Castle Breweries is to learn to co-exist after trying to take the bull by the horn at least more than once, home and away. They worked out a mutual truce and

both are in business, quietly reaping away the profits from the same East African market and it is only the grass that can wither as the elephants rest on it after a complete exhaustive fight.

For the three companies, opening websites f or their marketing, advertisements, staff recruitment, and corporate social responsibility campaigns and so on is in line with modern technologies, with the older company taking a stronger lead. EABL has benefited most getting a great market expansion regionally and on all continents. Their market is now so big, they are struggling with volumes, to the extent of eliminating certain brands to make sure their main brand Tusker never gets finished off the shelves. That was the case for when "Senator" brand nicknamed "Obama" raised to 40% sales at the time Senator Barak Obama visited Kenya in 2006. At the rate it was going up, there would not have been enough barley for Tusker, let alone other brands that cater for the cross-spectrum of the customer base. It was reduced to Keg which is controllable as the number of customized pressure containers is limited to only a few outlets.

4.6.2 Inconsistency of Raw Materials

Droughts affect quality of EABL raw materials. The year the country suffers rain shortfall (Mother Nature), the whole manufacturing sector that relies on the raw materials suffer. Even sugars yield, depends on the amount of rainfall or irrigation available. Mumias which depends on natural rain suffers yield quality and quantity whenever this is less. Long drought spells also mean non-arson fires that gut down sugar cane plantations. The company has then to take emergency measures and crush cane that was not planned for or has not matured enough after all the necessary inputs. Heavy rains also mean transportation of the harvested cane becomes very expensive and prohibitive. The outsourced transporters carry on the increased costs to the company which is passed on to hurt the contracted out-growers, ending up with demoralized suppliers. Poor infrastructure hikes the costs of raw materials for all the three manufacturing companies.

4.6.3 Competitors

Even though Bamburi respondents rated their competitors weak in all areas, the trend shows they are steadily growing and are threats perceived or not. They are concentrating

fast in replicable technological resources. Some of Mumias respondents have rated their competition high and more so, on the global and regional rather than national scale. Competitors of EABL are rated weak in product quality, product diversity and pricing, but not too much settled considering the competitors' growth potential.

4.6.4 Government Policy and Taxation

EABL makes malting at its malting factory in Industrial Area in Nairobi from barley after barley has been harvested from the farm. The malt is transferred to the brewing factory in Ruaraka or elsewhere to brew malted lagers. They pay full tax as if they are selling to a new customer. According to financial analysis, the customer gets the product on the shelves at a price 2.5 times what EABL would have demanded through the distributor for the same profit margin.

4.7 Sample Production data and Ms-Excel Trend Analysis for one plant

(Sample production data is available in the Appendix 4.1 on page 81)

The aim of the researcher was to indicate the continuous improvement achieved through one of the manufacturing companies that is striving to attain sustainable competitive advantage through the continuous and programmed uplifts of the technological resources. This covered a period of two and a half years.

Chart 4.1A: Production trend between July 2005 and October 2007

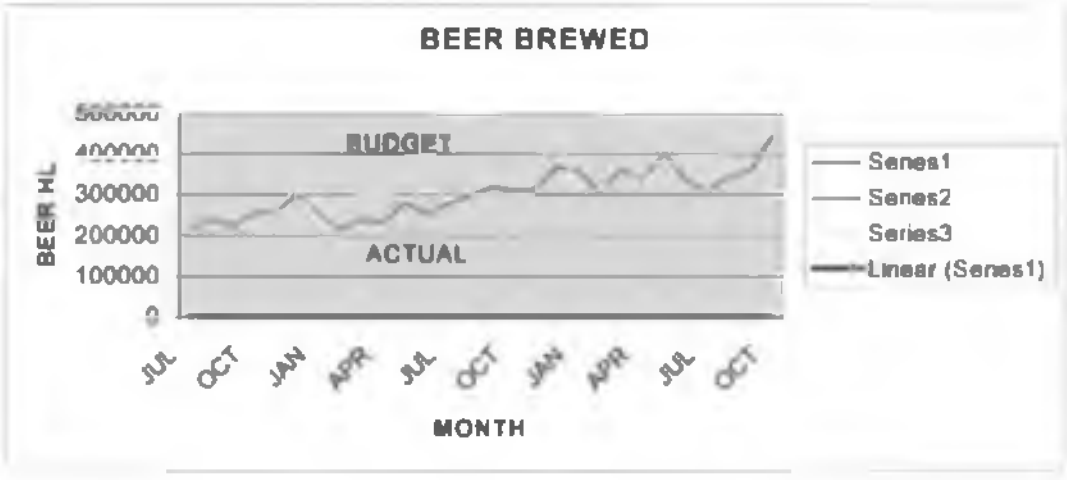
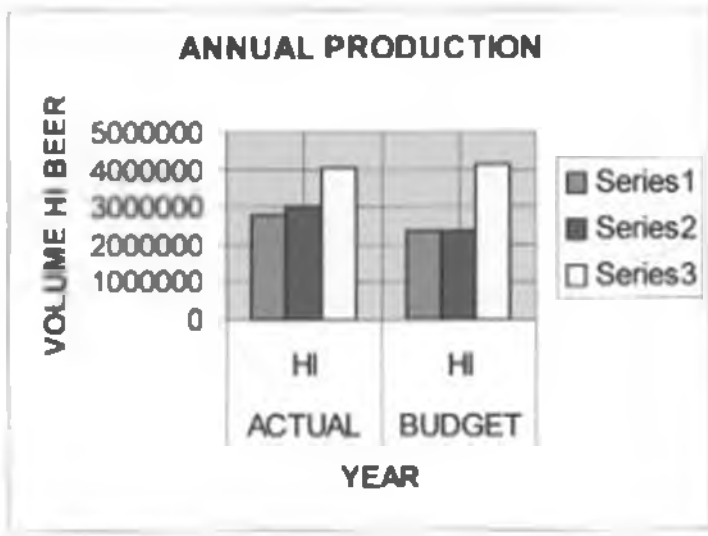


Chart 4.1: 3-year Annual Production



There is a sharp rise in production, almost doubling after introduction of the state of the art equipment in one process line. Chart 4.1 and Chart 4.2 illustrate.

Chart 4.2: Production trend chart for No. 1 Brand

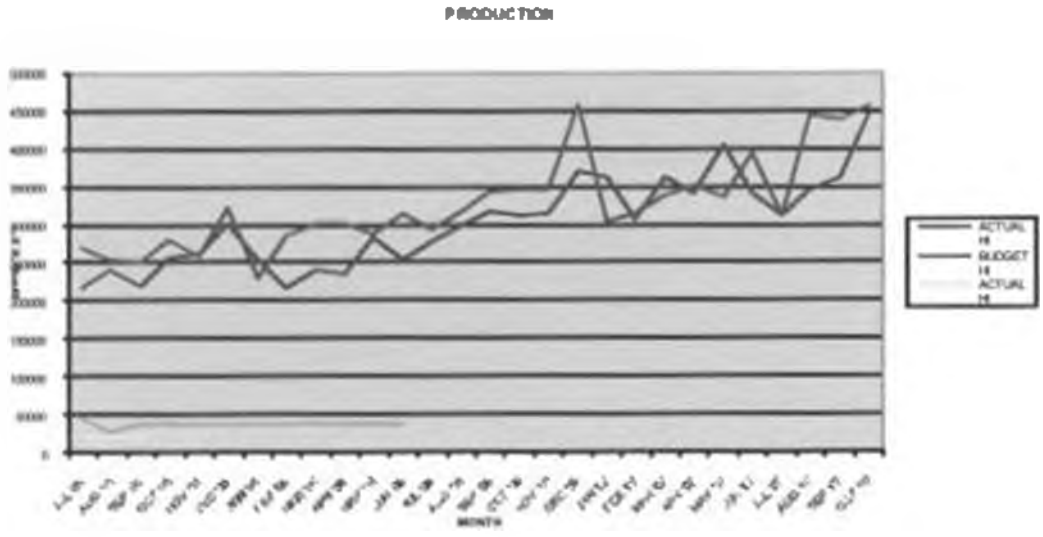


Chart 4.3A: CO2 Collected (Blue) & CO2 Used (Red)

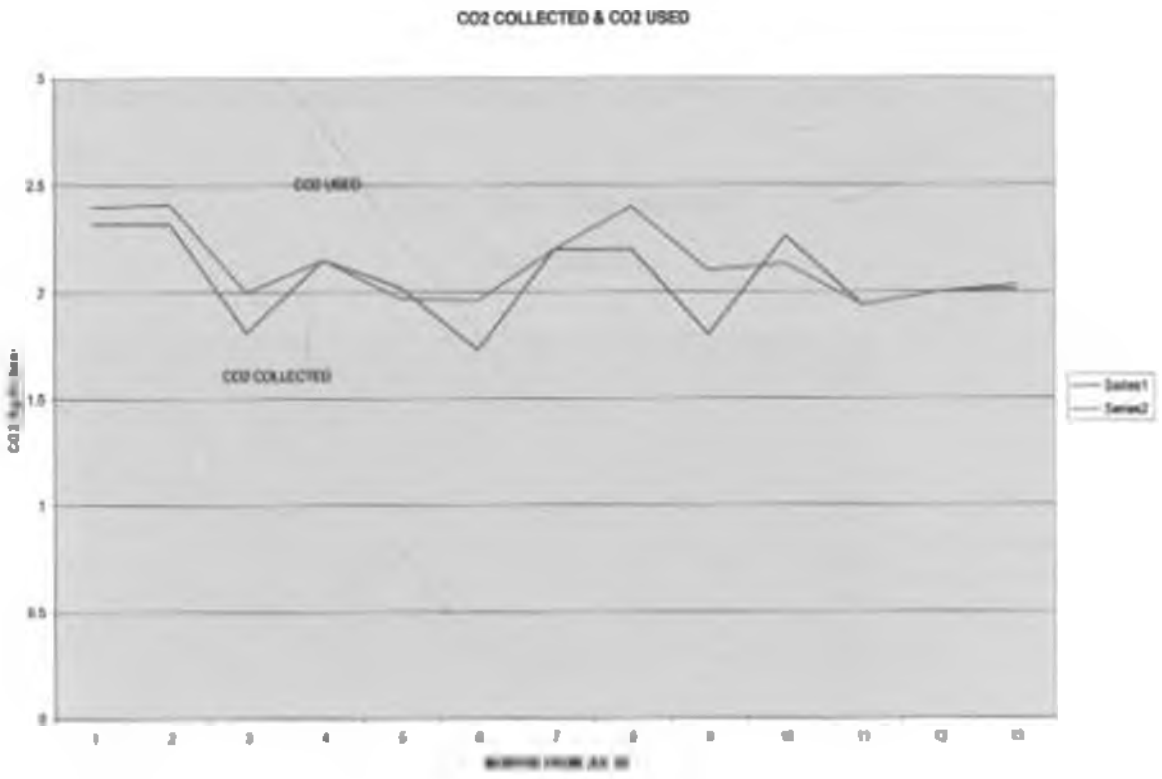
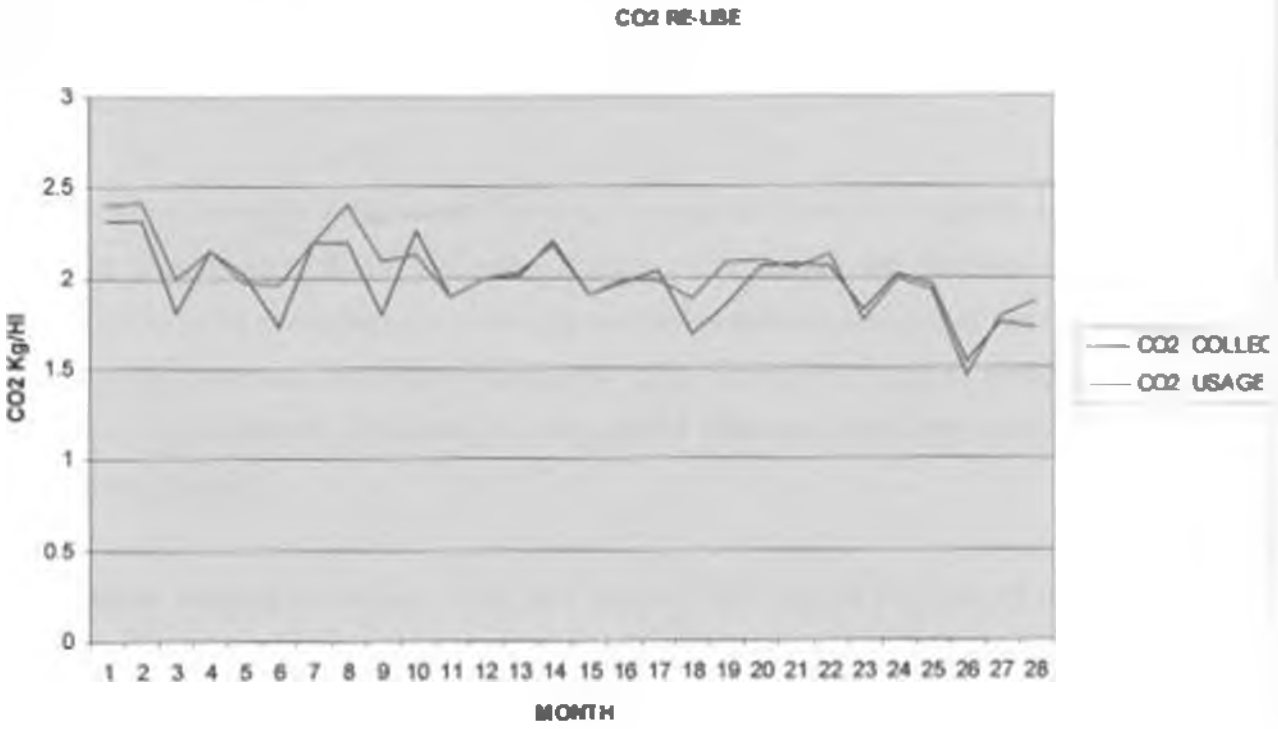
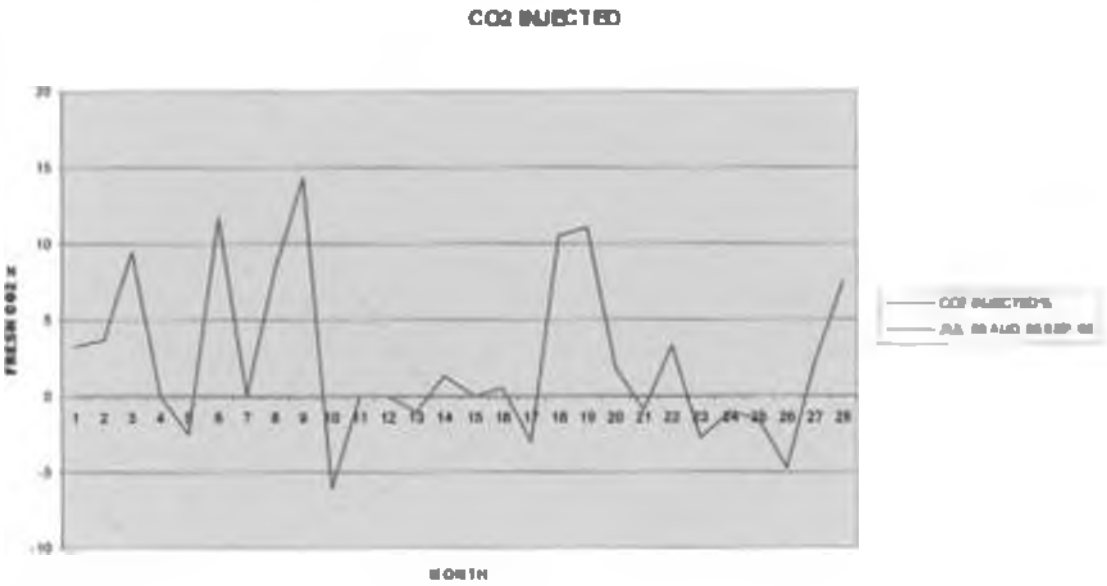


Chart 4.3: CO2 Collected and CO2 Used



Charts 4.3 and 4.3A illustrate improved balance between CO2 collected and CO2 used which implies less CO2 will be required to be replenished for a long time, making major cost savings and improving profitability and competitiveness using technologically superior equipment as a resource for sustainable competitive advantage.

Chart 4. 4: CO2 Injected

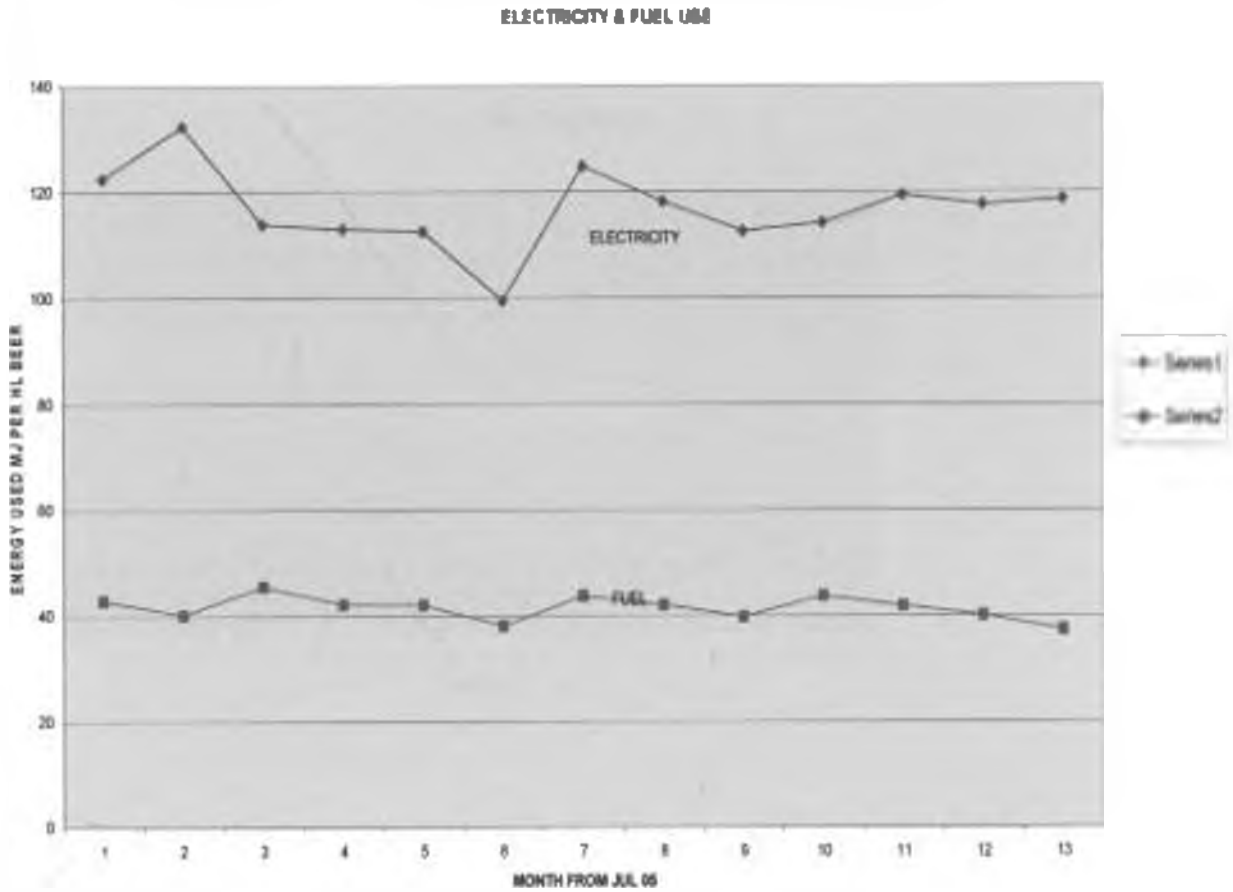


CO2 injected reduced drastically and negative values means that even some more CO2 is extracted from the process using the state of the art equipment and improved closed circuit production and at much reduced pressure. Charts 4.3, 4.3A and 4.4.

Chart 4.5 below illustrates insignificant reduction in fuel and electricity usage as seen in these trend graphs. This means that other reasons exist, calling the attention of the manufacturer to solve under the continuous improvement approach which may require re-establishing the necessary resources towards this goal. Alternative forms of Energy are areas for example that are addressed by other world class manufacturing companies, among a host of others.

The anomalies realized in January 2006 and January 2007 shows the loss of overall efficiencies at the time new equipment is installed and commissioned before real efficient production

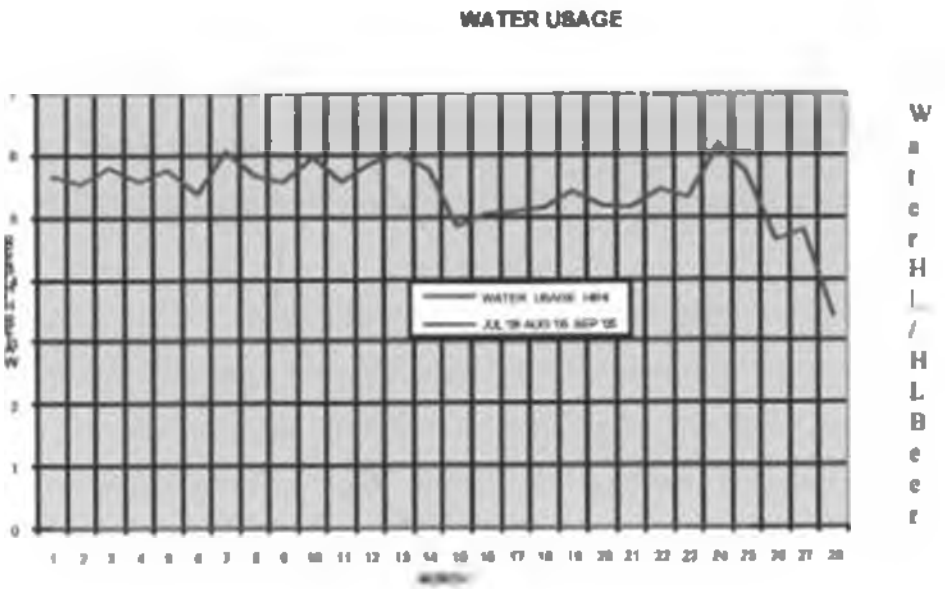
Chart 4.5: Electricity and Fuel Usage in MJ/Hl of No. 1 Brand



Note reduced unit water usage per unit beer made after state of the art new equipment was installed as illustrated in Chart 6 below implies greater profitability and competitiveness. Water usage is a cost in the beer making process.

Chart 4.6 shows the trend over the three years and the drop can be easily recognized to almost half the previous usage. This helped to reduce production costs proportionally and hence the cost strategy for sustainable competitive advantage, using technological resources.

Chart 4.6: Water Usage in Hecolitres water/ Hectolitre beer (HI/HI) for No. 1 Brand Beer:
Blue graph (New trend) = July 2005 to October 2007



CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of findings

The problem of the multiple case study was to find out if the resource based view has permeated into East African Breweries Ltd, Bamburi Cement Ltd and Mumias Sugar Company Ltd and also whether the technological resources and capabilities these Kenyan large manufacturing firms have give them sustainable competitive advantage over rivals.

The objectives of the study were to establish technological resources and distinctive capabilities that give large manufacturing firms a sustainable competitive advantage to establish the leading edge resources as well as to determine challenges a large manufacturing firm faces in use of technological resources for sustainable competitive advantage.

All the three companies reported using a wider distribution network, identifying unique ways of distributing products and services, have more convenient locations compared to competitors in the same area, use superior technologies, have shorter delivery times, ensure that outlets are secure and attractive, making them well-lit, safety measures are in place, have segmented the market and have differentiated their products and services using their technological resources.

They had concentrated on the core-business in which they had technological superiority and associated resources. They have subcontracted the other services which are non-core Boosting the company name and reputation through sales promotions advertising, better public relations and corporate social responsibility by sharing the technological advances to the community creates a permanent goodwill and loyalty. They all agree on having good feedback systems for customers to aid in product and service improvements. This cannot be effective without using the latest technologies available for example website support systems and intranet connections to these customers.

Mumias Sugar Company was reported to be in dire need of international strategic partners and correct benchmarking so they can catapult themselves as the bud of sugar

business on the continent. They seem to be struggling to make the radical changes in the main input resources, the cane and best methods of manufacture. The Computerized Maintenance Management Systems (CMMS) is not yet appreciated fully or fully understood at Mumias Sugar Company.

The respondents thought the levels of computerization are good, but what are insufficient are the levels of alignment with human resource skills, equipment, materials, methods, processes and procedures. It is imperative to stress that based on what Chanzu (2003) found out, many manufacturing firms in Kenya have taken a slow approach to embracing latest computer technologies as compared to the service sectors. This realignment must be fast if manufacturing firms hope to create an impact here and out there. Otherwise they will be taken over and or wiped out of the scene altogether due to the eminent liberalization being pressed by not only COMESA, but also European Union and World Trade Organization against unfair trade practices which includes protectionism by national governments.

5.2 Conclusions

5.2.1 Technological Resource Plan in Operations Strategy

The operations strategies using the technological resources available by all the three companies are frequently reviewed quarterly, semiannually, annually and follow strategic plans that cover bunches of a few years. EABL has 5-year Strategic Plan. Bamburi introduced, once they adopted the Lafarge Corporation system of the Three Year Technical Plans (TYTP's) starting 1993/5, and these are accessible within the Lafarge Group worldwide. This is a system of continuous improvement and growth and involves business process reengineering where members of the group are found lagging behind. Mumias has a similar three-year technical plan system.

5.2.2 Sustainable competitive advantage using Technological Resources

The essence of resource-based approach in projecting sustainable competitive advantage is the primary road to follow and the market-based as secondary. The manufacturing companies involved in the survey appeared to have developed a resource-based approach to operations especially as appertains to information technology. Several companies whose strategies have been based upon developing and exploiting clearly defined goals,

these companies sought to use the resources within them to have competitive advantage over their competitors. The technological resources reported to have been in use include: human resource technical skills, specialized tools, facilities, equipment, time, customer participation, and alternative technological resources, both internal an external.

5.3 Recommendations

5.3.1 Technological state of the art of manufacturing business

It is already appreciated that each manufacturing firm has to adopt state of the art technologies in manufacturing of the product. The people skills must be aligned to these technologies through internalized as well as international exposure. Company culture, Corporate, financial, marketing, operations, the 6P's and 6M's of manufacturing must all be realigned to the company's technological changes envisaged through the appropriate advanced manufacturing technologies (AMT). All these resources synergistically combined will give the company the economical rent it requires for sustainable competitive advantage. It is imperative for every Kenyan manufacturing firm to get a World-class manufacturing strategic partner as any success stories in Kenya today has some connection to the International strategic partners. There is no time to re-invent the wheel; and the economies of scale work the firm into growth and profitability.

5.3.2 Timely speed of change as a technological resource base

With availability of internet and high speed of innovations, companies should create on time changes some of which should be in-built to the manufacturing processes, in other words automation, centralized control manufacturing and computerized integrated manufacturing should be adopted.

5.3.3 Human Resource skills as technological resource base

The company that has put a minimum entry level for recruitment at Diploma for the respective discipline controls the quality right at inception. The personnel with minimum necessary education requirements come in with a certain amount of knowledge that can be tapped straightaway and with further training it is easy for the manufacturing company to benefit from the capabilities created with minimal training.

For specialized training, this has to be deep-rooted and specific to some individuals. Attachment of new employees to experienced workers for this specialization is necessary and for the motivation for the older workers to feel wanted for their experiences. It cannot be over-emphasized as it has been realized that the culture of one-company one-family works miracles while at the same time associating with the local community through Corporate Social Responsibility matters boosts the image of the company and with it the products through good will.

5.4 Limitations of the Study

5.4.1 Population and sample

The population is Kenya manufacturing firms and while the study has picked on only three manufacturing companies. Every company has some unique conditions and challenges that are only specific to the organization. So the findings are limited to generalized challenges and conditions.

5.4.2 Vast world of Technological Resources

Technological resources are very many and a research project at this level cannot exhaustively cover the effects the manufacturing firms in Kenya have had in their sustainable competitive advantage in relation to their operation and manufacturing strategies.

5.5 Suggestions for further research

5.5.1 World class manufacturing

Despite economies of scale, it is clear that very few manufacturing firms have clearly aligned their manufacturing methods and computerized advanced manufacturing methods to world-class at scale 5. Further research is recommended to see how all manufacturing firms in Kenya have gone towards achieving world-class using the resources they own or are capable of owning.

5.5.2 Operations/ Manufacturing Strategy and Resource Based approach

Few firms have adopted the Operations/Manufacturing strategy and those clearly seen as embracing it are confident of competing across the borders now. The Resource Based View is furtherance of this Operations approach to the next level of competition; many firms that carefully considered this during the strategic change management have reaped their fruits three-fold. How many firms in Kenya today appreciate the Resource Based View?

REFERENCES

Amulo, I.O. (2002). Benchmarking order delivery Process for Continuous Improvement Kenya Oil Industry. Unpublished MBA Project Paper. University of Nairobi, Kenya.

Ansoff, H.I., & McDonell E.J. (Eds). (1990): Implanting Strategy Management. Prentice Hall.

Aosa, E. (1992). An Empirical Investigation of Aspects of Formulation and Implementation of Strategic Planning within Large, Private Manufacturing Companies in Kenya.

Barney, J. (1991). Firm Resources and Sustained Competitive Advantage

Benjaafar, S. & Ramakrishnan, R. (1995). Modeling Measurement and Evaluation of Flexibility in Manufacturing Systems. *The International Journal of Production Research.*

Bierbusse, T., & Siesfeld, T. (1997). Measures that matter. *The Variances of Strategic Performance Measurement. April – May 1997.*

Blaine, M. (1991). Balanced Score at http://www.amazon.com. Posted on 7 May 2007. Select the "About Amazon.com" links.

Boaden, R. (1996). Is Total Quality Management really unique? *Total Quality Management. Oct-Nov 1996, Vol. 7, Issue 5*

Buzzel, R.D. & Gale, B.T. (1987). Linking Strategy to Performance. *PIMS project.* New York, NY: Free Press. *California Management Review Vol. 40, No.4, Summer 1998*

Chanzu, S.M. (2002). A Survey of Business Outsourcing Practices amongst private Manufacturing Companies in Nairobi. *Unpublished MBA Project Paper.* University of Nairobi, Kenya.

Chase, R.B., Jacobs F.B., & Aquilano, N.J. (2004). Operations Management for Competitive Advantage, 10th Ed., McGraw Hill

Chune, F.M. (1998). Changes in the Business Environment in Kenya. A Study of their influence on Food Manufacturing firms in Nairobi. *Unpublished MBA Project Paper* University of Nairobi.

CMMS Directory (Posted 25 Sep 2007). CMMS Maintenance Software and Fleet Maintenance Vendors at www.cmms-directory.com/cmms-software-guide.htm

Cooper, D. R., & Schindler, P.S. (Eds). (2003). Business Research Methods. Irwin.

Coughlin, P., Ikiara, G.K. (1988). Industrialization in Kenya, In search of Strategy. EAEP, London.

da Silveira, G. (2001). Exploring Trade-off concept. *International Journal of Operations and Production Management Volume 21, July 2001, pp 947-962*

Deming, W.E. (1986) Out of the Crisis. Originally published in 1982. Posted at Amazon.com, Smarter.com and Target.com official sites on 1 Oct 2007 from yahoo search results.

Dessler G. (2004). Human Resources Management, 9th Ed., Prentice Hall (now Pearson Education, Inc.). New Jersey, USA.

Dilworth, J.B. (1992). Operations Management. Design Planning and Control for Manufacturing and Services. McGraw Hill, Birmingham.

Dooner, M. (1991). Conceptual Modeling of Manufacturing Flexibility. *International Journal of Computer Integrated Manufacturing, Vol 4, No 3.*

Dostaler, I. (2000). Trying to Resolve Manufacturing Performance Trade-offs: The Case of the British Contract Electronics Assemblers. *Canadian Journal of Administrative Science, Sep 2000, Vol. 17, Issue No. 2.*

Drucker, P.F. (1998). The Information Executives Truly Need. Measuring Corporate Performance. Harvard Business Review.

Drury, C. (Eds). (2004). Management and Cost Accounting. Book Power formerly ELST with Thomas Learning, supported by CfBT, London

East African (07 Aug 2007). Cement firms merger will create Regional Giant to fend off Asian import competition. *Weekly publications, Nairobi, Kenya.* Replicated in enews.tinet.net on 08 Aug 2007.

Frisbie, R. (1986). The use of microcomputer programs to improve the reliability and validity of content analysis in evaluation. Paper presented at the session, Qualitative research methods, at the Annual Meeting of the American Educational Research Association, San Francisco, 1986, April

Mimetic Convergence. Reported on Content Analysis – Wikipedia, the free encyclopedia.htm on 1 Oct 2007.

Gugnon S. (1999). Resource-based competition and the new operations strategy. *International Journal of Operations and Production Management Vol. 19 No.2 pp 125 138.* OMCB University Press 014443577. Universite du Quebec a Montreal, Canada.

Galbreath and Garvin (2004). Academy of Best Conference Paper 2004 BPS: L6

GATT (1994). The WTO is born. *Focus, GATT Newsletter, 1994 May, NO. 107, Special Issue.*

Gaw B. (2007). Manufacturing Basics & Best Practices Bulletin (Posted on 7 Sep 2007) @ http://bbasicsllc.com

Gekonge, C.O. (1999). A Survey of Strategic Change Management Practices by Kenyan Companies: A case of companies listed at the NSE. *Unpublished MBA Project Paper*. University of Nairobi. Kenya.

Gewal, R., & Tansuhaj, P. (2000). Building Organizational Capabilities for Manufacturing Economic Crisis. The Role of Market Orientation & Strategic Flexibility in Manufacturing Systems. *The International Journal of Production Research*.

Goldratt, E. (2006). Process of Ongoing Improvements (POOGI) Posted on 10 Nov 2006 @ www.goldrattconsulting.com.

Government of Kenya in Session Paper No. 2 (1996). Industrial Transformation to the year 2020. Government Printer. Nairobi.

Grant, R.M. (2001). The Resource-Based Theory of Competitive Advantage: Implications for Strategy Formulation. *California Management Review Vol 33 No 3, pp 114-35*.

Haksever C., Render B., Russell R.S., Murdick (2000 July). Service Management and Operations, 2nd Ed., Prentice Hall. New Jersey, USA.

Hapisu, G. (2003). FPZs – Strategic Planning versus Competitive Advantage. *Unpublished MBA Project paper*. University of Nairobi, Kenya.

Hayes et al (1998) Strategic Operations: Computing through Capabilities – Text & Cases. Harvard Business School. The Free Press. New York.

Hayes, R.H., & Wheelwright, S.C. (1984). Restoring our competitive edge. Competing through Manufacturing. John Wiley & Sons. New York.

Hecox, W.E. (1988). Structural Adjustment. Donor Conditionality. *Industrialization in Kenya, In Search of Strategy*. EAEP, London.

Hill, T (1994) Manufacturing Strategy Text and Cases. 2nd Ed. II, Richard D. Irwin Posted on 5 May 2005 at http://www.mansci2.uwaterloo.ca/~msci723.96w2.htm

Holsti, O.R. (1969). *Content Analysis for the Social Sciences and Humanities*. Reading, Mass.

ISO Technical Committee 176 (2004). Quality Management Principles. Posted on 8 May 2005 at http://www.iso.org/iso/en/iso-9000-14000/understand/qmp.html

Johnson, G., & Scholes, K. (Eds). (2002). Exploring Corporate Strategy. Prentice Hall International (UK) Ltd.

Johnson, H.T., & Kaplan R.S. (1987). Relevance Lost. Harvard Business School Press, Boston.

Kabur, E.A. (2002). Usage of Brand Equity Assets in Positioning Brands: The Case of Agrochemical Industries based in Nairobi. *Unpublished MBA project paper*. University of Nairobi, Kenya.

Kahigu, T.M. (2003). Information and Communications Technologies, Business Process Reengineering at Kenya Commercial Bank. *Unpublished MBA Project paper*. University of Nairobi, Kenya.

Kaplan, R. S., & Norton C.P. (1996). Translating Strategy into Action. The Balanced Scorecard. Harvard Business Press, Boston, Massachusetts.

Kathuria, R., & Partoui, F.Y. (2000). Aligning Work-force Management Practices with Competitive Probity & Process Technology. A Conceptual Examination. *Journal of High Technology Management Research, autumn 2000, Vol 11, Issue No. 2.*

Kenya Industrial Research & Development Institute [KIRDI] (1997). Kenya Directory of Manufacturing Industries.

Kibe, J.M. (2000). Application of Inventory Manufacturing Practices: A Survey in Large Manufacturing firms in Kenya. *Unpublished MBA Project Paper*. University of Nairobi, Kenya.

Kinibi, C (1999). Message from the Chairman. Kenya Association of Manufacturers Directory 1998/99. Nairobi.

Kirui, S.K.I. (2001, September 27). Competitive Advantage Through Outsourcing of Non-core Logistics Activities within the Supply Chain of British American Tobacco of Kenya. *Unpublished MBA Project paper*. University of Nairobi, Kenya.

Kiruthu, Z.N. (1994). Total Quality Management Status in Kenya's Manufacturing Sector. *Unpublished MBA Project Paper* University of Nairobi, Kenya.

Kombo, H.K. (1997). Strategic Responses by firms facing changing Environmental Conditions. A Study of Motor Vehicle Franchise Holders in Kenya. *Unpublished MBA Project Paper*. University of Nairobi, Kenya..

Kotelnikov, V. (2007). Resource-Based View (RBV) of Firms: Resource-based Model; Achieving Superior Returns by exploiting Internal Resources and Capabilities. Posted on 23 Sep 2007 @ http://www.1000ventures.com/business_guide/mgmt_strategic_resource-based.html Adapted from "Strategic Management" (Eds) (2001), 1000ventures.com.

Krisppendorf, Klaus (1980 & 2004). *Content Analysis: An Introduction to Its Methodology*. 2nd edition, Thousand Oaks, CA: Sage 2004 (currently the most important book available, first edition was from 1980)

Kruger, L.P. (1997). Strategic Manufacturing Priorities for South African Manufacturers. The need to shift the Emphasis and improve on the current Performance Levels. Center for Business Management, University of South Africa.

Laswell, H. (1935). Who Gets What, When, How. University of Chicago Press.

Leong, G.K., & Ward, P.T. (1995). The Six P's of Manufacturing Strategy. *International Journal of Operations & Production Management. Vol. 15, Issue 12.*

Leting, N.K. (2003, November 1). The Relationship between Technology and Competitive advantage: The case of Vegetables' and Animals' oils and fats Manufacturers in Kenya. *Unpublished MBA paper*. University of Nairobi. Kenya.

Low, J., & Siesfeld, T. (1998). Measures that matter. *Non-financial Performance Strategy and Leadership, March/April 1998.* Posted on 8 Oct 2006 at http://www.pbview.com perform articles/measuresthatmatter.htm

Lutta, S.W. (2003). Outsourcing Distribution Logistics, East African Breweries Supply Chain. *Unpublished MBA Project paper*. University of Nairobi, Kenya.

Mapes, J. & New, C. (1997). Performance Trade-offs in Manufacturing Plants. *MCB International Journal of Operations & Production Vol.17, Issue 9/10.*

Mbeche, I.M. (1977). The Management of Kenyan Industrial firms in a Liberalized Economy. *Contemporary Management Journal* University of Nairobi,.Kenya.

Mbeche, I.M., & Yego, D.K.S. (1996). A survey of the Application of Forecasting Methods in Large Manufacturing firms in Nairobi. *The Nairobi Journal of Management, Vol. 2. Oct 1996.*

Mintzberg, H. (1994). The Rise and Fall of Strategic Planning. Prentice Hall. New York

Motari, F.M. (2003). Outsourcing Logistics. *Unpublished MBA Project Paper*. University of Nairobi, Kenya.

MSN Encarta (2007). Reuters Updated: 5:08 p.m. E1 May 9, 2006. U.S. Business-MSNBC.com, Los Angeles

Mumbi, B.K. (1998). Foreword from Chairman, EPC. Export Promotion Council of Kenya Export Directory 1998.

Munyiri, S.R. (2000). A Survey of the use BPR in Kenyan Pharmaceutical Manufacturing Industry. *Unpublished MBA Project Paper*. University of Nairobi.

Mwangi, P.M. (2002). Advanced Manufacturing Technologies in Kenya. The case of Agro based industries. *Unpublished MBA Project Paper*. University of Nairobi, Kenya.

Naisbitt, J. (1982). Mega trends. Based on content analysis of U.S. media.

Nemetz-Mills, Nyong'o, P.A. (1988). The possibilities and Historical Limitations of Import Substitution. African Academy of Sciences, Nairobi. *Industrialization in Kenya, In Search of Strategy*. EAEP, London.

Nyamwange, S.O. (2001, October 29) Operations Strategies Applied for the Competitiveness of Kenyan Large Manufacturing firms. *Unpublished MBA project paper*. University of Nairobi, Kenya. Vol. 12.

Obado, Z.O. (2005) Competitive Strategies employed by the Sugar Manufacturing firms in Kenya. *Unpublished MBA Project Paper*. University of Nairobi, Kenya.

Ombura, F. (2003). A Survey of Improvement Methods applied in Operations Management for Companies quoted at NSE. *Unpublished MBA Project Paper*. University of Nairobi, Kenya.

Omiti, M. (2003). Financial Performance of Firms with TQM programs. *Unpublished MBA Project paper*. University of Nairobi, Kenya.

Ongwae, C.O. (2002). A Survey of Value Based Management by companies in Kenya: A case of companies in Kenya, Companies quoted at the NSE. *Unpublished MBA project paper* University of Nairobi, Kenya.

Osewe, E.O. (1998). The Choice of Performance Measures Used in Divisional Companies. A Survey Study among Listed Companies. *Unpublished MBA Project Paper* University of Nairobi, Kenya.

Owiye, O.P. (1999). Why Kenyan Sugar firms are failing to compete effectively within the Liberalized Trading Environment. *Unpublished MBA Project Paper*. University of Nairobi, Kenya.

Owuor, S.J.O. (2003). The Use of Information Technology as a Facilitator of Business Process Reengineering: The Case of Bid Co Oil Refineries Limited. *Unpublished MBA Project Paper* University of Nairobi, Kenya.

Pearce II, J.A. & Robinson, Jr. R.B. (2004). Strategic Management Strategy Formulation & Implementation. 3rd Ed., Richard D. Irwin Inc., USA.

Pedler, Burgoyne & Boydell (2000). Chap 3: Capabilities, Competencies and beyond Business Process Reengineering.

Porter, E.M. (1991). Towards a Dynamic Theory of Strategy. *Strategic Management Journal of Production and Operations Management*. Posted on 10 Aug 2007 at http://www.chpa.ewu.edu/~pnemetzmills.Omch2/OMOfac.htm

Phrontis Ltd (2006). Resource Base centre. Posted on 13 Dec 2006 at http://www.Phrontis.com

Pricewaterhouse Coopers (2007). Industrial Manufacturing. *Pricewaterhouse Coopers 2006/2007* at www.pwc.com

Schneiderman, A.M.N. (2001). Six Sigma, Good Concept, Poor Method.

Schonberger, R.J. (1986). World Class Manufacturing. Free Press, New York.

Skinner, W. (1969). Manufacturing Missing link in Corporate Strategy. *Harvard Business Review, May-June 1969.*

Skinner, W. (1984). The Productivity Paradox. *Harvard Business Review, July-Aug 1984.*

Stark, G. Jr. (1988). Time – the Next Source of Competitive Advantage. Harvard Business Review, July-Aug 1988.*Total Quality Management, Vol. 12, No. 7 & 8, 2001, 900-912.*

Trochim, W.M.K. (2000). Research Methods Knowledge Base. Posted on 23 Nov 2006 at http://trochim.human.cornell.edu/KB/sampprob.htm

Uma, S. (Eds). (1992). Research Methods for Business: A Skill Building Approach. Wiley & Sons, New York.

Wal-Mart (14 May 2007) Japan and Germany. BBC World Service.

Waruingi, J.K. (2003). A Survey of the Extended Alignment of ICT Strategy to Business Strategy for companies quoted at the NSE. *Unpublished MBA project paper.* University of Nairobi. Kenya.

APPENDIX 1: QUESTIONNAIRE

PART I: COMPANY PROFILE

1. Location …
2. Position of respondent …
3. Educational level of respondent (Optional) …
4. Training of respondent (Optional) …
5. Experience of the respondent (years) …
6. How can you describe ownership of the company? (Please tick one)

Local ☐ Foreign ☐ Both (Local & Foreign) ☐

7. The best classification of your manufacturing operations is:

	Food, beverage & tobacco
	Wood, Wood products, Paper products, Printing & publishing
	Chemicals, Petroleum, Rubber & Plastics
	Non-metallic mineral products except petroleum
	Basic metal industries, Metal products, Machinery & Equipment
	Others (Please specify)

8. The market for your product is:

Local ☐ Foreign ☐ Both Local & export ☐ (State ratio) ☐

9. Which of the following best describes the number of different types of products that you manufacture? 1 - 5 ☐ 6 – 10 ☐ 11 – 15 ☐ 15 & above ☐

10. Which of the following best describes your manufacturing process (es)

	Automated/Computerized
	Mechanical
	Manual
	Both Mechanical & Manual
	All of the above

11. What is the company's annual turnover in KES?

	Up to 5 bn
	5 bn to 15 bn
	15 bn to 25 bn
	Over 25 bn

14. Which of the following best describes your company's level of technological investment in KES?

	Up to 5 bn
	5 bn to 15 bn
	15 bn to 25 bn
	Over 25 bn

15. On average, how often do you introduce new products? (Please tick one):

	Monthly
	Quarterly
	Semiannually
	Annually
	Other (Please specify)

PART II: OPERATIONS STRATEGY

1. Does your company consider manufacturing/operations strategy as enhancing long-term business performance and success? (Please tick one). Yes ☐ Not sure ☐ No ☐
2. On a scale of 1 to 5 (where 5 is the most important and 1 is the least important), please indicate the importance attached to each of the factors of operations strategy by your company by putting it in the right hand column:

a) Quality of Products	
b) Cost	
c) Flexibility	
d) Time/speed	
e) Innovativeness	
f) Others (Please specify)	

3. For each of the following operations strategies please indicate the reasons of its inclusion in your operations strategy

a) Quality of Products	
b) Cost	
c) Flexibility	
d) Time/speed	
e) Innovativeness	
f) Others (Please specify)	

4. What problem do you get in setting up and implementing an effective manufacturing strategy with regard to each of the following operation strategies?

a) Quality of Products	
b) Cost	
c) Flexibility	
d) Time/speed	
e) Innovativeness	
f) Others (Please specify)	

5. What are your strengths in each of the following operations priorities?

a) Quality of Products	
b) Cost	
c) Flexibility	
d) Time/speed	
e) Innovativeness	
f) Others (Please specify)	

6 How do you evaluate your effectiveness in each of the operations strategies? (Please give any indicators, metrics and/or measures you use)

a) Quality of Products	
b) Cost	
c) Flexibility	
d) Time/speed	
e) Innovativeness	
f) Others (Please specify)	

7. How often do you review your operations strategies? Please tick one

	Quarterly
	Semiannually
	Annually
	Other (Please specify)

8. Who in your company is involved in the following operations strategy processes?

a) Formulation	
b) Implementation	
c) Evaluation	

9. Please give any other information that you think is useful to this study

.....

.....

PART III: RESOURCE BASED VIEW

1. To what extent are your customers involved in the product design process. (Please tick one). Very actively [ ] Actively [ ] Neutral [ ] Passive [ ] Not at all [ ]

2. Over the past 2 to 5 years your company has been working closely with suppliers (Please tick one): Very actively [ ] Actively [ ] Neutral [ ] Passive [ ] Not at all [ ]

3. Please indicate the communication media your company used to notify employees of the upcoming changes, according to most used, with 1–Least used and 5- Most used

Medium	1	2	3	4	5
Newspapers					
Radio					
Internal Mail Manual					
Internal Mail (Intranet)					
Notice Board Memo					
Television					

4. Among the following goals please indicate the order of importance to your company by ticking in the right box with 1 = Not important, 5 = Most important.

	1	2	3	4	5
Survival					
Growth					
Profitability					

5. Please tick the bracket that best describes how employees were impacted by strategic management change: Relocations to new work stations ☐
Reassignment to other duties ☐ Layoffs ☐

6. Please insert a value from 1 – Little improvement to 5 – Highly improved.

On time Production	Shipping	Defect Rates	No. & Extent of work stoppages	Productivity	Overall Profitability

7. Does your plant possess equipment and/or processes protected by the firm's patents?
YES ☐ NO ☐

8. Do the patented equipments or processes help your company to gain competitive advantage?
YES ☐ NO ☐

9. How does the process technology in your plant compare to industry in Kenya, regionally, and globally?

	Kenya	Regionally	Globally
Poor or low end of the industry			
Below average			
Average or equal to the competition			
Better than average			
Superior			

10. What term below describes your production equipment relative to your industry?

Absolutely state of the art	
Better than most companies in the industry	
About equal to the industry average	
Below the industry average	
Poor, near the bottom of the industry	

11. Over the past 2 to 5 years what has been the effect of patented equipment and processes (Please tick)

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
i) Has had positive effect on manufacturing cost					
ii) Has affected the level of wastage in the plant					
iii) Has positively affected the percentage of deliveries customers receive on time					
iv) Has positively affected the no. of days from receipt of raw materials to delivery to customers					
v) Has affected production flexibility					

12. Please indicate any other factors that will enrich this study

.....

13. Do employees receive training to perform multiple tasks? Yes ☐ No ☐

14. Management takes seriously all product and process improvement suggestions (Please tick one).

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

15. Over the last 2 to 5 years, lessons acquired within the plant (Please tick as in 11 above)

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
i) Has had positive effect on manufacturing cost					
ii) Has affected the level of wastage in the plant					
iii) Has positively affected the percentage of deliveries customers receive on time					
iv) Has positively affected the no. of days from receipt of raw materials to delivery to customers					
v) Has affected production flexibility					

16. Please indicate any factors that would enrich this study

.....

17. It is important to establish long-term mutually beneficial relationship with suppliers (Please tick one)

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

18. To what extent does the plant maintain close communication with suppliers? (Please tick one)

At all times	Sometimes	Only when necessary	Not at all

19. How often do customers give feedback on quality and delivery performance? (Please tick one)

Very frequently	Frequently	Neutral	Somewhat frequently	Not at all

20. How important are the following in formulating your strategies? Pick value from 1 = Not important to 5 = Very important

Existing competition	New competitors	Suppliers	Increased customer sophistication	Substitute products

Government policy	Infrastructure	Political Connections	Any Other (specify)

21. To what extent are the following involved in strategy formulation in your organization with 1 = Least extent to 5 = Great extent?

Executive Board	Chief Executive	Temporary cross-functional teams	Consultants	Functional leaders

Functional teams	Marketing Manager	Any other (specify)

22. How do you rate the extent to which the following functions presently impact on your company's strategy formulation with 1 = Least impact to 5 = Great impact?

Operations	Marketing	Finance	Shareholders	The Board	CEO	Customer	Suppliers

23. How would you describe your business environment with 1 = Very stable to 5 = Very turbulent [ ]

24. What changes have taken place in the recent past (10 – 20 years) that have had an impact on the way you do business with 1 = Little impact to 5 = Great impact? (Insert value in the table)

Technological advancements	Existing competition	New competitors	Increased customer sophistication	Liberalized exchange rates
Infrastructure	Government policy	Substitute products/services	Any other (specify)	

25. a) Have you had to change your corporate image? Yes ☐ No ☐

b) In what ways? …

26. Who are your customers, with 1 – Least focus to 5 = Major focus

Corporate	Individual Businessmen/women	Government & Quasi-Govt Agencies		Parastatals, cooperatives
Middle salaried employees		Lower salaried employees	Any other (specify)	

27. a) Has your type of customer changed as a result of changes in business environment?

Yes ☐ No ☐

b) In what ways? .....

28. Indicate the level of importance to you the aspects of competition, with 1 = Little impact to 5 = Great impact (Insert value in the table)

Technological advancements	Existing competition	New competitors	Increased customer sophistication	Liberalized exchange rates
Infrastructure	Government policy	Substitute products/services	Any other (specify)	

29. How do you rate your competitors on each of the following for 1 = Very weak to 5 = Very strong

Product quality	Product diversity	Market share	Growth potential	Location
Distribution network (branches)	Pricing	Strategy/Marketing	Profitability	

30. a) At what technological resources are you better of than the competitors? …

How have you reached that position? …

b) Where are you worse than the competitor technologically? …

How are you trying to overcome your disadvantage? ……

31. For 1 = Not utilized, 2 = Least utilized, 3 = Moderately utilized, 4 = Fairly utilized, 5 = Utilized to a great extent.

1. Broadening the product line to close the vacant gaps	
2. Offering high quality products & service	
3. Using a wider distribution network	
4. Narrowing the distribution network	
5. Identifying unique ways of distributing products/services	
6. Having more convenient locations compared to the other competitors in the same area	
7. Using superior technology	
8. Having shorter delivery lead times	
9. Ensuring that outlets are secure & attractive, e.g. well lit, safety measures are in place, etc.	
10. Segmenting the market	
11. Differentiating the products/services	
12. Having low cost pricing structure	
13. Concentrating on the core business and subcontracting other services	
14. Boosting the company name and reputation through sales	

promotions, advertising, better public relations	
15. Having good systems for receiving customer feedback to aid in product & service improvement	
16. Energy Efficiency measures	
16. Any other (specify)	

32. What ERP solution does your company implement?

SAP	Oracle Financials	BAAN	NAVISION	ORION	Other (specify)

33. In the company's justification for implementation of the ERP, how would you rank the following reasons with 1 = Strongly disagree, 2 = Disagree, 3 = Indifferent, 4 = Agree, 5 = Strongly agree?

1. Need to better manage information resource	
2. Support for competitive advantage	
3. Innovative ways of doing business	
4. Competitors had implemented the same system	
5. Industry/world trends	
6. Customer demands	
7. Criticality to operations	
8. Overwhelming benefit from the system	
9. Other reasons (state)	

34 Capability Maturity Model (CMM): A scale for assessing the degree of built-in documentation and discipline in a process, in which the scale goes from Level 1, with no formal process, to Level 5, with a continuous, rigorous and self-improving process. Assess where you think your organization lies. Note that Level 5, your company is rating at par with world class companies.

Level 1	Level 2	Level 3	Level 4	Level 5

35. What Computerized Maintenance Management System have you adopted?

Maximo	Mantland	Maintenance Pro	SAP	Other (Specify)

36. Computerization Methods used with 5= Very much to 1= Not at all. Pick a value between 1 and 5

CAD	CAM	CIM	CNC	CMMS

37. Measurement of Strategic Alignment to Information & Communications Technology: Information and Communications Technology strategy contains the technology scope, the competencies, and governance. Level 1: the weakest, without processes and communications needed to attain alignment. Level 2: Beginning Alignment Process. Level 3: Established the Alignment Process. Level 4: Have Improved Alignment Process. Level 5: Information and Communications Technology and other business functions (marketing, finance and production among other) adapt their strategies together using fully developed processes. The areas are Communication, Metrics, Governance, Technology, Human Resources and Partnership). Please tick one for your organization.

Level 1	Level 2	Level 3	Level 4	Level 5

38. Any statistical and improvement charts that will amplify the improvements made like capacity utilization factors, reliability indices, energy efficiencies, productivity indices and other tangible metrics would enhance the aim of this survey. Kindly attach.

APPENDIX II: Sample Production Trend Data for one Manufacturer

KENYA BREWERIES LTD OPERATIONS JULY 2005 TO OCTOBER 2007

	BREWING						UTILITIES							
		BEER BREWED (Hl)		KEG		Brew house EFFI	WATER USAGE	FUEL	ELECTRICITY USAGE	CO_2 COLLECTED	CO2 USAGE	CO_2 INJECTED	CO_2 INJECTED
	MONTH	ACTUAL	BUDGET	ACTUAL	BUDGET								
KPI		Hl	Hl	Hl	Hl	%	Hl/Hl	MJ/Hl	MJ/Hl	Kg/Hl	Kg/Hl	Kg/Hl	%
1	JUL '05	217876	269881	19633	46048	100.5	5.7	122.5	42.9	2.32	2.4	0.08	3.333
2	AUG '05	239980	253183	21787.9	27881	99.9	5.56	132.4	40.21	2.32	2.41	0.09	3.734
3	SEP '05	220751	251942	20506	37881	100.3	5.82	113.9	45.6	1.81	2	0.19	9.5
4	OCT '05	256487	280986	40990	37881	99.92	5.6	113	42.2	2.15	2.15	0	0
5	NOV '05	261542	260503		37881	99.84	5.8	112.6	42.1	2.02	1.97	-0.05	2.538
6	DEC '05	303010	323787		37881	99.84	5.4	99.5	38.2	1.73	1.96	0.23	11.73
7	JAN '06	254201	230208		37881	100.3	6.1	124.8	43.8	2.2	2.2	0	0
8	FEB '06	217343	285662		37881	100.3	5.7	118.2	42.1	2.2	2.4	0.2	8.333
9	MAR '06	241578	301839		37881	100.4	5.6	112.6	39.8	1.8	2.1	0.3	14.28
10	APR '06	234713	303122		37881	99.7	6	114.2	43.8	2.26	2.13	-0.13	6.103
11	MAY '06	282635	288865		37881	99.4	5.6	119.4	41.9	1.9	1.9	0	0
12	JUN '06	254949	315456		37881	99.6	5.9	117.6	40.1	2	2	0	0
13	JUL '06	279527	293935			99.4	6.04	118.6	37.36	2.03	2.01	-0.02	0.995
14	AUG '06	298592	316692			99.2	5.78	110.3	36.79	2.18	2.21	0.03	1.357
15	SEP '06	319284	344179			99.21	4.87	100.8	36.22	1.91	1.91	0	0
16	OCT '06	314092	347702			99.3	5.06	107.8	38.23	1.97	1.98	0.01	0.505
17	NOV '06	315327	346322			99.52	5.09	105.7	37.66	2.04	1.98	-0.06	3.030
18	DEC '06	371580	457842			99.63	5.18	112.8	33.19	1.69	1.89	0.2	10.58
19	JAN '07	364150	304783			99.5	5.42	129.5	36.92	1.85	2.08	0.23	11.05
20	FEB '07	306875	315883			99.55	5.22	129.8	36.11	2.06	2.1	0.04	1.904
21	MAR '07	363340	338238			99.2	5.18	124.4	36.02	2.07	2.05	-0.02	0.975
22	APR '07	342344	352640			99.7	5.47	134.3	33.76	2.06	2.13	0.07	3.286
23	MAY '07	404548	335721			99.14	5.34	118.5	36.26	1.82	1.77	-0.05	2.824
24	JUN '07	340869	394948			99	6.15	128	36	2.02	2	-0.02	-1
25	JUL '07	312592	312591			99.4	5.76	135.6	37.81	1.96	1.93	-0.03	1.554
26	AUG '07	346543	444730			99.4	4.65	110.8	34.17	1.53	1.46	-0.07	4.794
27	SEP '07	362529	440718			98.81	4.82	109.8	35.52	1.75	1.79	0.04	2.235
28	OCT '07	445507	458813			100.6	3.41	109.8	32.15	1.72	1.86	0.14	7.527
2005	F'05 ACT	2817044	2339518			99.99	5.67	145.6	41.89	1.96	2.42	0.46	19.01
2006	F'06 ACT	2985065	2339518	102917	452739	100	5.73	116.7	41.89	2.06	2.14	0.08	3.739
2007	F'07 ACT	4020528	4148885			99.36	5.43	119.2	36.49	1.99	2.02	0.03	1.485