Strategic performance measurement within an operations strategy context: a survey of Kenyan Practices

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A management research project in partial fulfillment of the requirements of the degree Master of Business Administration (MBA) Faculty of commerce, University of Nairobi

2002

DECLARATION

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

Signed..... Date... 4/11/2002

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This Project has been submitted for examination with my approval as university supervisor.

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On the significance of synchronising strategy and performance measurement:

'Cheshire Pussy,' Alice Began," would you tell me, please which way I ought to go from Here?'" that depends a good deal on where you want to go.. Implying if you don't know where you are going any way will do.

Carroll Lewis' "Alice's Adventures in wonderland."

On the paradoxes that face manufacturing and operations managers face, Wickham Skinner wrote:

> . . . On Monday they want low cost
>
> On Tuesday they want high quality
>
> On Wednesday they want no backorders
>
> On Thursday they want no inventories
>
> On Friday they want maximum overhead absorption, so we have to work over the weekend.

Leong and Ward, *The six P's of manufacturing Strategy.*

Dedication:

In memory of my grandma Clemencia Kerubo,

As good a scholar, Critic and Philosopher as they come

ABSTRACT

Every firm has a mission, or vision of where it wants to be in the long run. Successful accomplishment of which calls for development of strategies to enable the firms focus their efforts in one direction - the mission. Information or competitive intelligence has emerged as a competitive weapon in the current marketplace. Information is essential in the setting agreed upon performance goals, allocating and prioritising resources and as indicators of areas that need management's corrective action. Having reliable information enables managers to effect positive change in organizational culture, systems, and processes. Performance measurement Systems when correctly developed provide such information.

This research project sought to survey how leading Kenyan firms link their operations strategy to (strategic) performance measurement. Of concern also was whether or not strategic consensus exists between Chief Executive officers (CEOs) and Operations/manufacturing managers (OM/MM) in terms of what each considers being important performance objectives and measurement of the same. The survey was carried among participants of the Company Of the year Awards (COYA) as representatives of best practitioners among Kenya's manufacturing and service companies. As a semi structured questionnaire was used as an interview guide to collect data. It was administered to both the CEO and OM top enable analysis of consensus

The findings point to the fact that successful firms have fully recognised the importance of the operations function in both generating and supporting overall business performance excellence. They recognise the need to pursue all the operations strategy priorities (quality, cost, flexibility, time/delivery speed and innovation) simultaneously as opposed to trading off one for the other. The differences in rankings are attributable to what constitutes order winners and order qualifiers in the industries and markets that the firms operate in. These firms have integrated the emerging non-financial performance measures into their performance measurement systems, however there is still strong emphasis on financial indicators and reports. They recognise the need for PMSs to answer such questions as, who are the key stakeholders and what do they want or need? What strategies do we have to put in place to satisfy the wants and needs of these key stakeholders? What critical processes do we require if we are to execute the strategies, what capabilities do we need to operate and enhance these processes and what contributions do we require from the stakeholders so as to maintain and develop these capabilities?

Acknowledgements

I feel greatly indebted to a lot of people who made my second homecoming at the university possible. Pride of place goes to the University of Nairobi who through the department of Management science funded my scholarship – I shall forever remain in debt. To my supervisor Mr John Kenduiwo for his inspiration and guidance through the entire programme a very big thank you.

To my friend Steve Onserio for daring thread where the eagles fly and making it seems so easy. All my Colleagues in the MBA Class for the stimulating discourse and resourcefulness, Particularly Mogesa and Basweti Aksante Sana. I wish to thank all my lecturers for making the programme a most enjoyable one. My very special regards to James Osano for the support and encouragement. Special thanks to Mr Mark Mungatana, My colleagues at Iberafrica Power and Soluziona Engineering and Systems for their support and encouragement, special thanks to Mr Fernando Ramos, Angel Vicente and Mr Julius Ogallo. A lot of thanks to all the respondents who took time to share their experiences.

To have come this far I owe it to my entire immediate and extended family; cousins uncles and aunties who are simply too many to mention each and every one of them -*Shukrani*. On their behalf therefore, Special thanks to my Mom Angeline for believing in me, my Dad Mariko for all the support, my uncles Peter and Patrick for urging me on. To my bro Joseph - you have to take it up from here.

Last but not least to two very special and dear people Cecilia and Julie for always being there, inspiring and supporting me.

Cosmas Getate Makori

October 2002

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CHAPTER ONE

1. INTRODUCTION

1.1 BACKGROUND

There is a common dictum in management that "if *you can't measure it, you can't manage it!*" or better still '*what gets measured gets done*' this underscores the importance of measuring Performance of a company's strategies. During the last few decades we have entered the information era, companies have become more complex because the world has evolved into one global village. Companies are facing stiffer challenges in their operating environments. Consumers and workers have become more knowledgeable. Information (competitive intelligence) and innovation are becoming competitive weapons. In terms of performance measurement, these changes have had three impacts. First, many organizations now seek actively to differentiate themselves from their competitors in terms of quality of service, flexibility, customization, innovation and rapid response: They have been forced to do so because they now find themselves competing in markets where value rather than cost is the primary driver. Competing on the basis of non-financial factors means that these organizations need information on how well they are performing across a broad spectrum of dimensions. If a business bases its strategy around its ability to customize products, then knowing whether it really is customizing products, and whether it is customizing them rapidly and cheaply enough, is essential. The traditional measures used to assess business performance simply do not provide this insight. Hence, businesses have been forced to change their measures because they have had to change their strategies (Neely, 1991). Consequently, managing modern institutions and companies cannot be based on ancient traditions and information gathering systems. Strategic performance systems have to aid firms to develop, communicate, measure and continuously improve their strategies

The subject of performance measurement is encountering increasing interest in both the academic and managerial ambits [De Tonia and Tonchia, 2001; Eccles, 1991; Neely, 1999; Crowther, 1996 etc]. This, for the most part, is due to the broadening spectrum of performances required by the present-day competitive environment and the new production /operations paradigm known as lean production or Word-Class Manufacturing (WCM). In addition there is need to support and verify the efficacy of performance improvement programs (*or management fads)* such as Just-In-Time (JIT), Total Quality Management (TQM)- from Japan; Concurrent engineering, Business Process Reengineering (BPR)-(Michael Hammer and others); Materials Requirement Planning (MRP) and Enterprise Resource Planning (ERP)- from the USA, Optimized Production Technology (OPT)- from Israel, flexible Manufacturing Systems (FMS) from the UK among other sources of best practice (Voss, 1995).Neely[1999] sums the debate thus: there are seven main reasons for the evolution of performance measurement systems: the changing nature of work; increasing competition; specific improvement initiatives; national and international quality awards; changing organizational roles; changing external demands; and the power of information technology. Many authors like[De Toni and Tonchia 2001; Dixon et al, 1990; Ecles 1991; Ghalayini and Noble 1996 etc] argue that traditional performance measures based on productivity and accounting techniques are no longer appropriate or representative of the information needs of today's competitive global markets. There is consensus on the need for alternative integrated performance systems that range from time as the basis of all measures to the integration of a variety of dynamic performance metrics relating to aspects of competitive strategy.

Kaplan and Norton (1992, 1996) observe that: "In many companies in the UK, as in the USA, the familiar cry "everything here is viewed in terms of the bottom line!" can be heard. In this sort of

corporate environment, financial indicators remain the fundamental management tool and could be said to reflect the capital market's obsession with profitability as almost the sole indicator of corporate performance. Opponents of this approach argue that it encourages management to take a number of actions, which focus on the short term at the expense of investing for the long term. This results in such action as cutting back on Research and Development, and revenue expenditure in an effort to minimize the impact on the cost side of the current year's Profit and Loss account, or calling for information on profits at too frequent intervals so as to be sure that targets are being met, both of which actions might actually jeopardize the company's overall performance rather than improve it. In general, the opponents of "the bottom line school" state that because of the pre-eminence of money measurement in the commercial world, the information derived from the many stages preceding the preparation of the annual accounts, such as budgets, standard costs, actual costs and variances, are actually just a one dimensional view of corporate activity.

During the early development of operations management as a discipline, the emphasis was on cost efficiency, with little attention being paid to the impact of operations management on customer service levels. The emphasis on cost reduction (*referred to in the literature an Taylorism and scientific school of management)* and measuring profits alone started to change with Wickham Skinner's article "Manufacturing ~the missing link in corporate strategy" (1969). In this article he demonstrated the importance of operations management in determining corporate performance and provided a framework for matching manufacturing strategy with the corporate strategy. He developed these ideas further in his article "The focused factory" (1974) where he argued that a plant cannot perform well on every yardstick and that each manufacturing unit should focus on a few performance measures, trading these off against performance measures, which are less important. The reaction of the accountants to this challenge has been the revision and updating of PMSs by innovative

accounting systems like Activity -Based Costing (ABC)[Johnson and Kaplan, 1987] and their extension to the measuring of the so-called non-cost performances that by nature are not explicitly economic-financial but are pressingly demanded by customers and stakeholders [Kaplan and Norton, 1992, 1996]. The literature is not quite explicit on how these non-cost performances should be measured.

The environmental factors which necessitate the development of emerging non-cost PMSs are twofold: -environmental turbulence (in terms of frequency and unpredictability of change) and on the other hand managerial complexity (due to the passage from strategies based on cost leadership to those based on differentiation/customization). The emerging PMSs are adapting to the "value strategies based not just on measuring and for control to ones based on measuring the creation of value. Maskell (1991) states that a good measurement system should be related to manufacturing/operations strategy, include non-financial measures, vary between locations, change over time, be simple and easy, give fast feedback, and aim to teach rather than to monitor. A "good system" should be comprehensive, causally oriented, vertically integrated, horizontally integrated, internally comparable and useful, (see also De Toni and Tonchia, 2001; White, 1996; Crowther, 1996 and Ghalayini and Noble1996). Good systems include the need to: link operations to strategic goals, integrate financial and non-financial information, measure what is important to customers, motivate operations to exceed customer expectations, identify and eliminate waste, shift the focus of organizations from rigid vertical bureaucracies to more responsive, horizontal business systems, accelerate organizational learning and build a consensus for change when customer expectations shift or strategies call for the organization to behave differently, and translate "flexibility" into specific measurement.

1.2 THE RESEARCH PROBLEM

Kenya's manufacturing and service industries have experienced drastic changes in the last few decades increased competition due to economic liberalization (particularly conditionalties imposed by the IMF and the World Bank, [Mbeche 1997, Coughlin and Ikiara 1988]. Globalization has resulted in consumers being more informed and demanding. To meet these ever changing demands, local companies have to develop strategic competencies. Studies by Maina (2001), Nyamwange (2001) made the following suggestions for further research: That there is need to detail the specific practices on each of the operations strategies like flexibility and systems design, the ***measuring performance and evaluation of operations /manufacturing strategies by successful companies***, and research to find out which of the performance priorities are order winners and order qualifiers in the regional economies among others. Neely (1999) adds the following questions: What are the determinants of business performance? Can the relationship between different dimensions of business performance be mapped? Can predictive performance measures, or leading indicators, be identified? What are the strengths and weaknesses of the various performance measures proposed in the academic and practitioner literatures? How valid is each of these measures? Does the appropriateness and validity of the measures vary according to the country and cultural setting? How can measurement systems be implemented? How can measurement systems be used to manage business performance? How can the evolution of measurement systems be managed over the long term? This study responds to the challenge by seeking to find out how leading Kenyan firms link their operations strategies to performance measurement. It goes further to test whether CEO's and MM/OM's are in consensus as to which performance objectives are important in enhancing excellent performance and the measurements thereto.

A number of studies have looked at the generic area of strategy they include but are not limited to: Aosa [1992] who did an investigation into aspects of strategy formulation and implementation within large private manufacturing companies in Kenya. The study found out that foreign companies differ significantly from local /Kenyan owned ones with the former being more formal a fact which was attributed to influence from parent companies, access to managerial resources, formal organizational structures and professional managerial approach to management. Karemu (1993) found large retail supermarkets practicing minimal budgetary forms of strategic management with reliance on intuition and informal planning. Shimba [1993] found mixed results in a study of strategic practices among companies in the financial sector, which variations arose due to variations in size, ownership and strategic managerial orientation. Most foreign firms had longer financial planning horizons compared to locals. Ogeto (1994) compared financial performance of public enterprises relative to privately owned ones and found inconclusive results. Osewe [1998] and Minja [1995] surveyed financial performance measurement used in divisionalised companies and the rationale for selection. The two studies focused on financial reporting of performance.

Elsewhere Nyamwange (2001) observes that most of the studies so far have concentrated on corporate planning and marketing strategies. A number of them have documented specific case studies [Kombo (1997) strategic responses by the motor vehicle industry, Gekonge (1999)- Strategic change management among participants at the Nairobi stock Exchange. Owiye (1999) Sugar industry's competitive incompetence, Kandie (2001)- strategic responses by KPLC. Chepkwony (2001) strategic planning among the petroleum firms ... among others. This study focused on the measurement of strategies among leading Kenyan firms using those that have participated in the Company of the Year award project as a representative sample.

1.3 OBJECTIVES OF THE STUDY

- To find out how leading Kenyan firms link their operations strategies to performance measurement, and hence the extent of adoption of emerging integrated PMSs
- To test whether there is consensus between Chief executives and operations/manufacturing managers as to which priorities are important in rankings and consequently which performance metrics are emphasized.
- To document the challenges associated with developing comprehensive strategic performance measurement systems.

1.4 HYPOTHESES:

- H_1: Companies in Kenya have adopted the emerging integrated performance measurement practices that effectively link overall company strategy, business strategy and operations strategy.
- H_2: There is no difference in the rankings of performance priorities by the various companies
- H_3: CEOs and operations Managers are more likely to agree than disagree on the competitive priorities of the company consequently there is consensus as to which strategy measures are important and the measures thereto.

1.5 IMPORTANCE OF THE STUDY

The findings of this study are expected to provide operations managers and other decision makers with insight into the emerging trends in strategic performance measurement. The priorities in which performance objectives are emphasized by leading companies will help other practitioners in redesigning their own measures. We hope to have enriched the literature and instruction on

operation management in Kenya. The study shall ignite the need for longer term (longitudinal studies) in this area of measuring of strategy among Kenyan firms. As pointed out in other studies the available literature is replete with case studies from the West, which as pointed out, by Aosa (1992) cannot be imported wholesale in the African context. We have our own peculiar characteristics. The findings may also attract other researchers to delve into areas in operations strategy and competitiveness, which hitherto remain furrow.

CHAPTER TWO

2 LITERATURE REVIEW

2.1 STRATEGY

Classical strategies owe their origin to the Greek word ***'strategos'*** which was used to mean the Army General [Mintzberg, et al., 1995]. They were strategies of war. Modern strategy is also about war with competitors for a share of the customer's heart and mind (loyalty). The most oft quoted definition of strategy in published literature is Mintzberg's 5 P's which describes strategy as a **Plan, Ploy, Pattern, Position or Perspective** or a mix of the five.

Strategy as a plan implies a consciously intended course of actions associated with deliberate leadership and documented. It has two attributes; 1) the fact that they are formulated in advance 2) they are developed with a purpose.

Strategy as a ploy- a maneouvre aimed at outsmarting the competition.

Strategy as a pattern- this refers to a stream of actions, which can be viewed by anyone looking at the organization's actions. This can be as a result of planned strategy or happen without intention.

Strategy as a position relates to the context and external environment. An organization selects a position where it can use its strengths and core competencies optimally.

Strategy as a perspective refers to the mindset and shared values of an organization, which guide employee actions.

Aosa (1992) defines strategy as the solving of a strategic problem, which is a mismatch between the internal characteristics of an organization and its external environment, through development of

organizational core capabilities that are correctly related with the external environment to exploit opportunities.

2.2 PERSPECTIVES ON OPERATIONS/MANUFACTURING STRATEGY

It is generally accepted by operations (*in servic*e, Fitzgerald et al, 1991*)* and manufacturing managers that operations management performance has a major impact on product cost, product quality, speed of delivery and delivery reliability- the key competitive priorities. In an attempt to provide a better understanding of how the operations /manufacturing function can be used to support corporate objectives, Skinner (1969) developed the framework that is the basis of modern operations strategy. This was based on the premise that there are many ways to compete, apart from cost, and that each manufacturing unit should focus on doing those few things well that are critical to the achievement of the corporate mission. Underlying his ideas is the concept of strategic trade-offs: the achievement of high levels of performance on one factor can only be obtained at the expense of performance on one or more other factors. An implication of the trade-off concept is that a number of companies can compete in the same market, each meeting the specific needs of a segment of that market.

Debate on tradeoffs has been long and protracted with such questions as: *Are trade offs really necessary? Do factories have to be focused? Is strategic fit good enough (see* Ferdows and De Meyer, [1990], Womack et al, [1990], Hayes and Pissano, [1996], skinner, 1992; New 1992; Porter, 1996; and Slack [1994] among others for some of the most incisive discussions on the paradoxes of trade-offs.

Many authors among them (Mapes and New, 1997; Hayes and Pissano, 1996; Noble, 1997; Flynn et al, 1999; Oakland, 1988; Garvin, 1987 etc.), point out that in recent years the existence of trade-offs has been questioned by the simultaneity or the cumulative school. These critics include proponents

of lean manufacturing like: (Womack, 1990; Hill, 1990; Roth and Miller, 1992; Schonberger, 1986; Ferdows and De Meyer, 1990; Slack, 1991 etc). Schonberger and Terry Hill particularly have been the most notable stating that, for the modern manufacturing company, trade-offs no longer exist. They argue that the factors leading to excellent performance on one factor also lead to excellent performance on the other factors. Therefore, world-class companies will be able to outperform their competitors on every aspect of performance. An implication of this is that there is a single generic manufacturing strategy, to become world class, which all manufacturers should be pursuing. In an attempt to provide an explanation of the dynamic nature of trade-offs, Ferdows and De Meyer (1990) have developed what they refer to as the sand cone model. This is based on the proposition that competences are cumulative rather than mutually exclusive. They suggest that lasting improvements in performance always involve the same sequence in the performance improvement process. First, quality is improved. Then, while improvements in quality continue, reliability is improved. Next, while improvements in these two performance areas improve further, flexibility is improved. Finally, while improvements in these three performance areas continue, cost efficiency is improved.

Spina [1998] and Gagnon [1999] observe that several frameworks have been developed to study manufacturing strategy. One basic distinction is made between the content and the development process of manufacturing strategy. Content refers to the specifics of what is decided about manufacturing, whereas process addresses how such decisions are made in an organizational setting, within which manufacturing must interact with other business functions and processes and across firm's boundaries. Subsequently, the various decisions should be linked in order to provide consistent support for chosen priorities (see Mills and Neely,[1998] for a pictorial representation model for presenting such decisions in a consensual manner. These are often categorized as *structural*

(the hardware)– such as capacity, facility, process, and vertical integration and *infrastructural (the software)* – such as planning and control, workforce, quality, performance measurement systems, organization and new product development and engineering. Voss [1995] and Buffa (1984) argue that the content of manufacturing strategy consists of the strategic choices in process and infrastructure and that operations strategy enhances competitiveness through manufacturing capabilities. Voss's proposes three paradigms for operations strategy i.e.: competing through manufacturing i.e. identify key success factors (order winners and order qualifiers, Hill, 1990), strategic choice of manufacturing strategy, and best practices and world-class manufacturing. All three paradigms have strengths and weaknesses and each partially overlaps the other. Hence a continuous loop is proposed.

In presenting the case for a *resource-based* view of strategy, Gagnon [1999] argues... " that the strategic management discipline has moved recently from a "market-based" to a "resource-based" view of competition. The former view sees operations as a perfectly adjustable system focused to successfully follow the rules dictated by markets, while the latter suggests that it is more profitable to focus on developing, protecting, and leveraging a firm's unique operational resources and advantages in order to change the rules of competition. This paradigm shift started with evidences that high performance is explained primarily by the strength of a firm's resources, and not by the strength of its market position. Some firms compete in the manner depicted by the sigmoid curve [Skinner, 1996]. They thrive by creating and managing chaos in the market place e.g. Hewlett Packard, Toyota Microsoft etc. This is supported by literature reviewed by Spina [1998] .The resource- based view has gained more importance after Prahalad and Hamel (1990) forcefully emphasized the link between core competencies and competitive strategy.

Gagnon addresses three broad issues, which have been thematic within the operations literature and where the resource-based view may help theory building: *The active role of operations within strategy; The demise of trade-offs in hyper-competition; and The implementation of world-class practices.* It is worthy noting that the three issues are related directly to what Voss (1995) has termed the three "paradigms" of manufacturing strategy. For example, the paradigm of "competing through manufacturing", based on the Hayes and Wheelwright (1985) IV- stage model points directly to the role of operations within strategy. The second paradigm, called "strategic choices in manufacturing", which concentrates on making strategic trade-offs between operating priorities, is being challenged in a time where hyper-competition makes order winners short-lived and where qualifiers are becoming tougher. Finally, the paradigm of "best practices", e.g. TQM, OPT, FMS, MRPII, ERP etc relates directly to a more fundamental issue, the implementation of new operations management approaches, which are expected to yield world-class performance. Gagnon further argues that these three paradigms will have to be updated in order to take account of the resource-based view of strategy, as a fourth paradigm may be emerging, dealing with "management fundamentals". At the heart of the knowledge-based economy, this new operation strategy may include such issues as culture and learning, which had been considered as secondary "organizational infrastructure" decisions. These issues do not simply have to be "aligned" with operations, but must be managed integrally, in order to be both supportive and generative of operating excellence.

Leong and Ward [1995] argue that the operating definition of manufacturing strategy in published research has often been too restrictive to accommodate the entire gamut of approaches used in practice. In particular, the manufacturing strategies of world-class manufacturers do not fit the prevalent planning orientation suggested by many researchers. They claim a multifaceted view of manufacturing strategy is needed to depict accurately the strategic efforts of all manufacturers. They

propose six distinct views of manufacturing strategy: **planning, proactiveness, pattern of actions, portfolio of capabilities, programmes of improvement, and performance measurement**. They further argue that the difference in manufacturing capabilities between US-based and Japanese - based firms cannot be attributed to strategic planning. Automakers such as Toyota and Honda are clearly World class and authors like Ohmae, Quinn and Mintzberg argue that they have achieved built sustainable capabilities incrementally and in the manner suggested by Hayes and Wheelwright. The H-W model argues for the evolution of strategy through four stages at Stage I the operations functions role within the organization is described as being *internally neutral* – it is expected to be neither proactive nor locked into any particular form of technology. It doesn't play any strategic role –Skinner's Missing link. Stage II is referred to as *Externally neutral* Here it seeks to maintain parity with the rest of the industry by following and adopting industry practices .It is characterized by capital investment. Stage III is describes as *Internally supportive* of corporate strategy. The operations function pursues a particular functional strategy at the same time ensuring decisions are coherent and in support of business strategy. Stage IV *Externally supportive* of the business strategy vis-à-vis competitors in the market place, operations is effectively managed continually seeking for capabilities in anticipation of customer needs striving to stay ahead of competition.

Unlike Mintzberg's 5Ps, Leong and ward's 6P's of manufacturing strategy are not definitions per se, rather each P is offered as a distinct view, a snapshot which is partially revealing about the strategic intentions an capabilities of manufacturing (the blind men and the elephant analogy) – assembling a sequence of such portraits over time captures the dynamic elements of strategy.

Planning: strategy as a plan is the most common view. Seminal work by Skinner (1969) featured a planning framework, which suggested the important items for manufacturing management to plan and a method for aligning manufacturing's strategic plan with a broader corporate planning

framework. Anderson et al [1989] define operations strategy as a long-range plan or vision for the operation function, which must be integrated with the business strategy and implemented through operations. Hill [1990], differentiates his planning framework by emphasizing the need for combining manufacturing and marketing functional strategies and incorporating them in corporate decision framework. Hayes and Wheelwright characterize Skinner and other writers as implying a stage III (internally supportive) role for manufacturing. Planning is generally top-down.

Proactiveness- is the single characteristic that discriminates between manufacturing functions that offer strategic benefit to the firm and those that don't. H-W framework illustrates this.

Patterns of actions- is attributed to Mintzberg as seen earlier. In order to make inference about manufacturing strategy from a pattern of actions, an observer must know which kind of decisions are strategic.

Portfolio of manufacturing capabilities: According to Hayes and Pissano [1996], porter [1996], manufacturing strategy is about selecting and creating operating capabilities as a company needs for the future. In addition, the portfolios of manufacturing capabilities of the manufacturing unit reflect the intersection of operational and market considerations. Ferdows and De Meyer showed that Japanese manufacturers ranked cost as their number one priority while American and European firms ranked quality as number one. They observe that the Japanese have achieved a high degree of quality; it now becomes in Hill's terms an order qualifier. They maintain quality while pursuing other capabilities (e.g. cost and flexibility) - the order winning criteria.

Programmes for improvement: are the means of building such capabilities, which are the basis for competitive advantage. How a firm chooses to expand its resources and programmes of improvement is critical to understanding its strategy. Majluf and Hax [1990] describe an action programme as "a structured, coherent, timed and evaluated continuum of actions with a clearly defined schedule for completion in a relatively short time span. Examples include JIT, TQM,

Computer Integrated Manufacturing, and group technology, flexible manufacturing etc. but must be coordinated with existing capabilities and strategic needs.

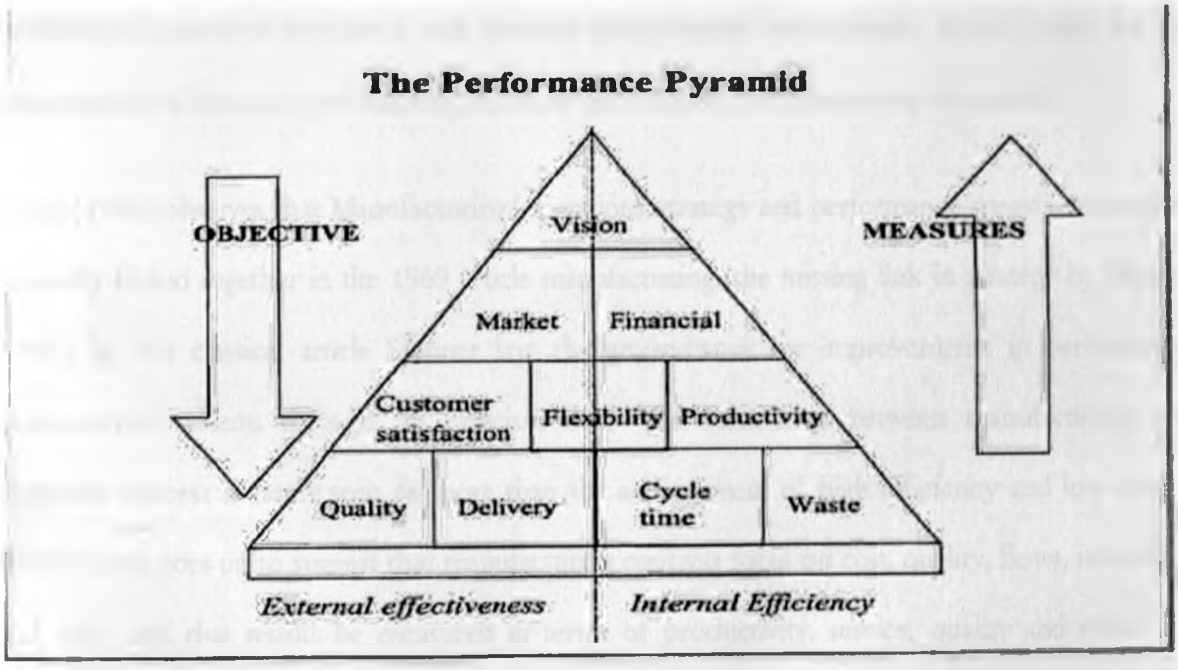
Performance measurement: (PMSs) provide a normative window through which manufacturing strategy can be viewed and the measures be evaluated. The very choice of measurement criteria ought to reflect the strategic goals of management. It's a strategy process issue because it provides information to strategy makers about the efficacy of strategic choices and suggests areas for strategic correction.

Integrating the six views of manufacturing strategy, they conclude that three of the views; planning, proactiveness and performance measurement describe the ***process*** of manufacturing strategy. The other three views; programmes for improvement, portfolio of manufacturing capabilities, and pattern of actions, represent the ***content*** of manufacturing strategy.

2.3 A FRAMEWORK FOR OPERATIONS STRATEGY

Operations strategy cannot be done in a vacuum. It must be linked vertically to the customer and horizontally to other parts of the enterprise (*See illustrated linkage models in* Heizer and Render, 1996; Chase et al, 1999; Pearce and Robinson, 1997; Johnson and Scholes, 1999. etc). There should be vertical alignment between the overall business strategy and the operations strategy., and also horizontally with other functional areas. There should be linkages between customer needs, their performance priorities and requirements for manufacturing operations, and the operations and related enterprise resource capabilities to satisfy those needs [Ward, and Bickford, 1996]. The general process is that customer based new product or current product requirements give rise to performance priorities that become the required priorities for operations Chase et al [1999]. These priorities link into "an enterprise barrel", because operations cannot satisfy customer needs without

the involvement of other departments. Given its performance requirements, an operation division uses its capabilities (technology, systems and people) to achieve those requirements- **win orders**. One of the criticisms of traditional PMSs is that they only measure outcomes and fail to link measurement to strategy or strategic performance. A number of models do try to depict this linkage they include, the performance pyramid, developed by Lynch and Cross, (1991), The performance pyramid shows the division of the key performance measures into external and internal. It links the objectives and measure. The company's vision is turned into strategies, which are then turned into specific performance priorities or objectives. Mills, Neely and Adam [47, 49 and 50] argue that measures should derive from stakeholders and not strategy.



Picture 2. The performance pyramid

Figure 2.1 the performance pyramid

Source: Lynch R.I and Cross K. F. 1991 Measure up! Yardsticks for continuous improvement Blackwell publishers Oxford

2.4 Performance measurement and competitive priorities

Neely (1991) points out that "Research in the field has been, and is being, undertaken by a diverse group of people from a wide variety of disciplines, including accounting (Bromwich and Bhimani, 1989; Chandler, 1977; Cooper, 1987; Johnson, 1983; Kaplan and Norton, 1996), business strategy (Chakravarthy, 1986; Simons, 1995), human resource management (IPM, 1992), manufacturing and operations management (Dixon et al., 1990; Fitzgerald et al., 1991; Neely et al., 1996), marketing (Fornell, 1992) and organizational behaviour (Meyer and Gupta, 1994). As one would expect, the research stance adopted by these individuals differs in terms of the questions being addressed and the methodology adopted. In essence, however, they are all seeking to address one of the two fundamental questions associated with business performance measurement, namely: what are the determinants of business performance; and how can business performance be measured?

White [1996] observes that Manufacturing/operations strategy and performance measurement were originally linked together in the 1969 article manufacturing, the missing link in strategy by Skinner [1969], in this classical article Skinner lays the groundwork for improvements in performance measurement systems through his criticism that; "the connection between manufacturing and corporate success is rarely seen as more than the achievement of high efficiency and low costs". Skinner then goes on to suggest that manufacturing controls focus on cost, quality, flows, inventory, and time, and that results be measured in terms of productivity, service, quality and return on investment. Following the work of Skinner, Wheelwright [1978] went on to suggest that performance measures be tied to the organization's strategy as reflected by its "competitive priorities". The items for which manufacturing has at least 80 per cent responsibility are listed as: *quality (conformance to specifications, reliability and durability); cost; flexibility (volume and process); delivery dependability; and speed (delivery speed and lead time) (See Vickery et al, 1993 for other items).*

Hall et al. [1991] use the categories of quality, dependability, waste, flexibility, innovation, and financial. White [1996] adopted the competitive priorities listed above because they appear to have been most widely accepted in the manufacturing strategy literature reviewed. Operations/ manufacturing's performance relative to these priorities will largely determine whether or not an organization can be successful in obtaining its strategic objectives.

According to Jonsson and Lesshammar (1999) performance measurement is not a given. It is not obvious how firms should measure their manufacturing performances. Various approaches, most of them with a large number of measures on different hierarchical levels exist. A serious problem with most performance measurement systems used in firms is that they often include too many different measures, which makes it difficult to understand the "big picture" (Keegan et al., 1989). Integration between measures is often problematic, and many papers have emphasized that firms have no effective system that covers all necessary performance dimensions (e.g. Roth and Miller, 1992; Ghalayini and Noble, 1996; Maskell, 1991;etc. Studies by Morita and Flynn (1997) and Schmenner and Vollmann (1994) showed that most studied companies needed seriously to consider changing their performance measurements. They argued that most firms were both using wrong measures and failing to use the right measures in correct ways. It is important to identify the critical dimensions in a performance measurement system (what to measure) and the optimum characteristics of the measures (how to measure). Crowther [1996] has come up with three such dimensions i.e. perspective (*Whose perspective- stakeholders*), Purpose (*for what purpose)* and focus (*temporal with regard to time – future Vs past or Organizational. See also Mills, Neely and Adam [46, 49, 50] for a five dimensional performance prism and a pictorial representation of business and functional strategies.*

2.5 Performance measures

The major weaknesses of traditional PMSs observed in the literature include the fact that: they are based on outdated cost management systems, are lagging metrics (time lagged), they are not related to strategy, are inflexible, expensive to produce and contradict continuous improvement [8] [9] [10] [13] [15] [16] etc. Scholars and practitioners have developed new PMSs, which provide managers with on time /online information that is necessary for daily decision-making. Their major characteristics include: having a clearly defined set of improvement areas and associated performance indicators that are related to company strategy and objectives vertically and horizontally, stress the importance of time in performance measurement. Link performance measurement, continuous improvement and the shop floor. The emphasis should be on continuous improvement rather than monitoring and control- they should go beyond just achieving but focus on actively planning for the utilization of benefits from an overall company perspective while guarding against sub-optimization.

Leading examples of these integrated performance measurement systems include: the " SMART" system, performance measurement questionnaire (PMQ) and the balanced scorecard.

2.6 Emerging models for strategic performance

2.6.1 THE SMART SYSTEM

The strategic measurement analysis and reporting questionnaire was developed by Wang Laboratories Inc., as a result of dissatisfaction with traditional performance measures such as utilization, efficiency, productivity and other financial variances (Ghalayini and Noble, 1996). The objective was to devise a management control system with performance indicators designed to define and sustain success. The SMART system can be represented by a four-level pyramid of

objectives and measures [Lynch and Cross, 1991] at the top is the corporate vision or strategy. At this level management assigns a corporate portfolio role to each business unit and allocates resources to support them. At the second level, objectives for each business unit are defined in market and financial terms. At the third level more tangible operating objectives and priorities can be defined for each business operating system in terms of customer satisfaction, flexibility and productivity. At the fourth level, the departmental level, customer satisfaction, flexibility and productivity are represented by specific operational criteria: quality, delivery, process time and cost. As the foundation of the pyramid, these operational measures are the keys to achieving higher level results and ensure successful implementation of the company strategy. For example quality is defined in Ghalayini and Noble [1996] as... translating the " voice of the customer" into appropriate company requirements at each stage from product/service concept to delivery. For marketing and R&D this means innovative designs within the price and reliability ranges expected by the customer. For production, quality is translated into reliability, aesthetics, and perceived quality...

2.6.2 The Performance Measurement Questionnaire (PMQ)

Dixon et al [1990] developed the PMQ to help managers identify the improvement needs of their organizations, to determine the extent to which the existing performance measures support improvements and to establish an agenda for performance measurement improvements. The PMQ consists of four parts. The first part provides general data to be used to classify the respondents. Part two of the PMQ assesses the company's competitive priorities and performance measurement systems. It consists of items labeled as " improvement areas". The respondent is asked to check a scaled score. The third part is similar to part two but it focuses on performance factors

(performance measures). The final part asks the respondents to provide performance measures that best evaluate their own performance and any other general comments.

The results of the PMQ are evaluated in four ways: alignment, congruence, consensus and confusion. Alignment analysis is conducted to investigate in general terms how well a company's actions and measures complement its strategy. Congruence analysis is conducted to provide a detailed understanding of how well the measurement system supports an organizations actions and strategy. Consensus analysis is carried out by grouping the data by management level or by functional group. This analysis shows the effect of communication. The goal of the confusion analysis is to determine the extent of consensus (standard deviation) regarding each improvement area and performance measure

2.6.3 The balanced score card (BSC)

Kaplan and Norton (1987, 1990, 1992 and 1996) developed a framework for an integrated performance system for strategic, operational and financial measures. The BSC provides answers to four basic questions: How do customers see us? (*Customer perspective*); what must we excel at? (*Internal perspective*); can we continue to improve and create value? (*Innovation and learning perspective*) : and how do we look to our share holders? (*Financial perspective*). The essence of an effective BSC is the creation of a cause and effect relationship between measures and strategy. For each of the four perspectives the managers set goals. Similarly, specific measures are specified in order to achieve each goal. The BSC has two main strengths. First, it summarizes in one management report many of the seemingly disparate elements of a company's competitive agenda. Second, it prevents sub-optimization by forcing senior mangers to consider all operational measures at the same time [Newing, 1995].

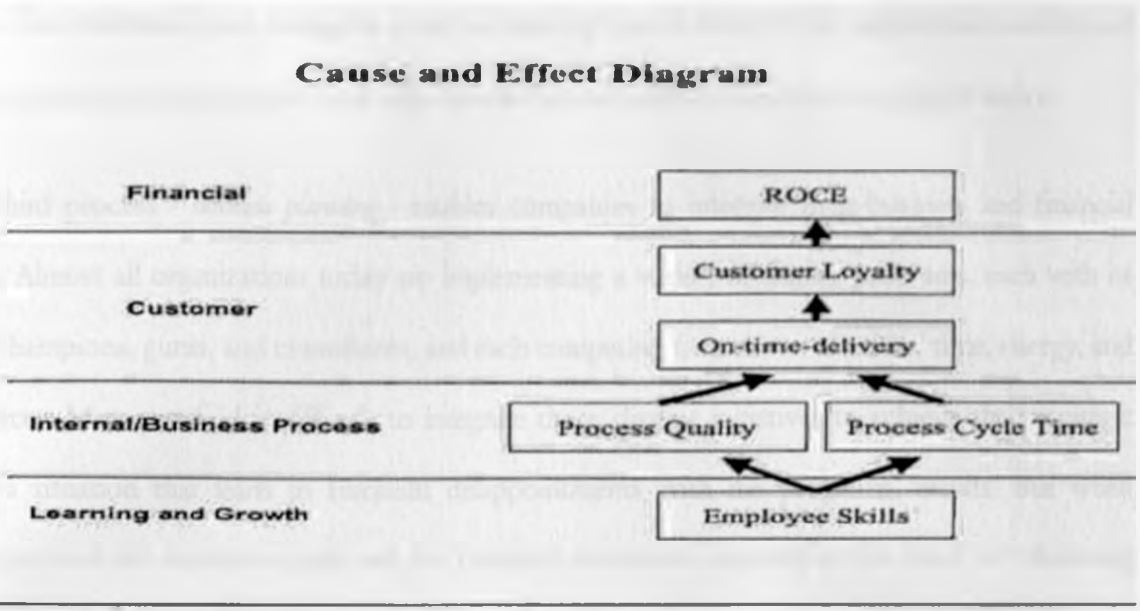


Figure 2.2 Cause and Effect Diagram

Source: Lynch R.I. and Cross K.F. (1991): *Measure up! Yardsticks for continuous Improvement*: Blachwell Publishers, Oxford

Kaplan and Norton [35] further argue that the scorecard can be translated to a four stage continuously looping process for strategy development and review. The first new process- translating the vision helps managers build a consensus around the organization's vision and strategy. Despite the best intentions of those at the top, lofty statements about becoming "best in class," "the number one supplier," or an "empowered organization" don't translate easily into operational terms that provide useful guides to action at the local level. For people to act on the words in vision and strategy statements, those statements must be expressed as an integrated set of objectives and measures, agreed upon by all senior executives, that describe the long term drivers of success.

The second process- *communicating and linking*-lets managers communicate their strategy up and down the organization and link it to departmental and individual objectives. Traditionally, departments are evaluated by their financial performance, and individual incentives are tied to short-term financial

goals. The *scorecard* gives managers a way of ensuring that all levels of the organization understand the long-term strategy and that both departmental and individual objectives are aligned with it.

The third process - *business planning* - enables companies to integrate their business and financial plans. Almost all organizations today are implementing a variety of change programs, each with its own champions, gurus, and consultants, and each competing for senior executives' time, energy, and resources. Managers find it difficult to integrate those diverse initiatives to achieve their strategic goals-a situation that leads to frequent disappointments with the programs' results. But when managers use the ambitious goals set for balanced scorecard measures as the basis for allocating resources and setting priorities, they can undertake and coordinate only those initiatives that move them toward their long-term strategic objectives.

The fourth process- *feedback and learning*- gives companies the capacity for what we call strategic learning. Existing feedback and review processes focus on whether the company, its departments, or its individual employees have met their budgeted financial goals. With the balanced scorecard at the center of its management systems, a company can monitor short-term results from the three additional perspectives-customers, internal business processes, and learning and growth- and evaluate strategy in the light of recent performance. The *scorecard* thus enables companies to modify strategies to reflect real-time learning.

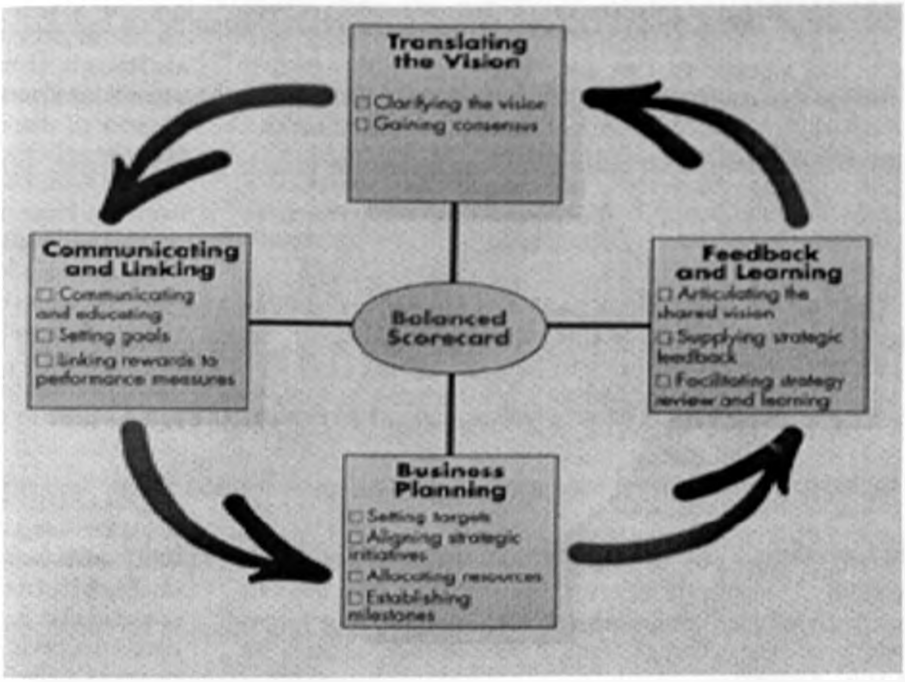


Figure 2.3 linking the Balanced Scorecard to Strategy

Source: Kaplan R.S., Norton D.P.,(1996):*Using the balanced scorecard as a strategic management system*, Harvard Business Review vol 7

2.6.4 The six sigma (6σ)

Six Sigma (6σ) is a business-driven, multi-faceted approach to process improvement, reduced costs, and increased profits. With a fundamental principle to improve customer satisfaction by reducing defects, its ultimate performance target is virtually defect-free processes and products (3.4 or fewer defective parts per million (ppm)). The Six Sigma methodology, consisting of the steps "Define - Measure - Analyze - Improve - Control," is the roadmap to achieving this goal. Within this improvement framework, it is the responsibility of the improvement team to identify the process, the definition of defect, and the corresponding measurements. This degree of flexibility enables the Six Sigma method, along with its toolkit, to easily integrate with existing models of software process implementation .Six Sigma originated at Motorola in the early 1980s in response to a CEO-driven

challenge to achieve tenfold reduction in product-failure levels in five years. Meeting this challenge required swift and accurate root-cause analysis and correction. In the mid-1990s, Motorola divulged the details of their quality improvement framework, which has since been adopted by several large manufacturing companies.

The Keywords in Six sigma are: Process control & instrumentation: Productivity, measurement & control: Quality assurance: Statistical quality control A well-designed, well-executed system keeps a process under control at an existing performance level. Control charts of the process can identify, and even predict, when the process is becoming unstable. Operational procedures specify actions necessary to stabilize and bring an out-of-control process back into control. Vital to the success of Six Sigma is having a suitable infrastructure that links the program to the company's bottom line. To optimize the benefits of Six Sigma, organizations must select the best projects and then incorporate the sensible use of Six Sigma tools within each of them. Goals can be set for the programs by surveying customers to judge needs and expectations relative to the product and service quality.. Companies serious about achieving 6s capability allow Black Belt practitioners, trained in use of statistical methods and tools, to apply their specialized skills to defined improvement opportunities. 12 sequenced steps ensure that a thorough examination of the process is conducted, as follows: Select the critical to quality characteristics; Define the required performance standards; Validate measurement system, methods, and procedures; Establish the current processes capability; Define upper and lower performance limits; Identify sources of variation; Screen potential causes of variation to identify the vital few variables needing control; Discover variation relationships for the vital variables; Establish operating tolerances on each of the vital variables; Validate the measurement system's ability to produce repeatable data; Determine the capability of the process to control the vital variables; and Implement statistical process control on the vital variables. Like

statistical process control (SPC) or statistical quality control (SQC), 6s uses SPC/SQC tools. What 6s methods add are tools, discipline, and know-how to improve processes. Three metrics are used to measure process performance. Potential process capability (Cp), and process capability (Cpk) indexes assess current process capabilities. Instability index (St) is used to examine a process across time.

CHAPTER THREE

3 RESEARCH METHODOLOGY

This study was a cross-sectional survey. The definition of variables and constructs was consistent with and borrowed from such studies as; White [1996]'s survey of taxonomy of strategy – related performance measures for manufacturing and Roth and Miller [1992]'s success factors in manufacturing. White [1996] particularly has a comprehensive literature review covering 51 works on strategy and performance measures.

The use of Best Practice Award databases and frameworks to study elements of operations strategy is quite prevalent in the literature. Examples include Mapes and New [1995], who used the Today Magazine and Cranfield School of Management, Best Factory Survey (UK) in analyzing performance trade-offs. Roth and Miller [1992] used the 1988 Manufacturing Futures Project (MFP) and Fortune 500 listing in analyzing success factors in manufacturing. Hayes and Wheelwright [1985] used similar criteria in operationalizing their four-stage framework. MFP was also used by and Ferdows and De Meyer [1991](to operationalize Sand-Cone model of developing manufacturing strategy), in their studies on manufacturing strategy, Kim [1998] in a study of strategies of Korean companies etc. Anderson Consulting [1993] has used best practitioners in their lean manufacturing enterprise-benchmarking report. Others include Schonberger [1986], Hill, [1990] and Peters [1995] etc

3.1 Population and sample

The population of interest constituted large manufacturing and service companies operating in Kenya. The sample constituted all the participants of the company of the year award (COYA) 2002 listing. COYA (74) is an acronym for the Company of the Year Awards an initiative of the Kenya institute of management. It is an annual programme that seeks to identify and publicly recognize companies that demonstrate excellence and integrity in their management practices. COYA's

objectives are to enable companies to determine how well they practice several aspects of management in some areas, namely: Corporate Planning, Financial, Marketing, Corporate Citizenship, Human Resource Innovation and Creativity, Quality, Environmental Management and Information systems

Using a highly development management practice assessment tool, COYA enables firms to identify their key strengths and areas that require improvement. This information is summarized in a confidential management practices report, which is presented to the company for management action. During COYA awards gala night, the most impressive companies receive awards for excellence for each business category with the top overall company being declared "Company of the Year". The Perceived benefits of COYA include;

- Develops a valuable selection of local case studies and successful business models for future management studies.
- Provide useful framework for evaluating management practice through key business indicators.
- Provides appropriate positive publicity through the media among others.

It is worth noting that the COYA initiative compares favorably with other best practice recognition initiatives like Cranfield Business School and Time magazine's UK best factory award, The Malcolm Baldrige National Quality Awards (USA) The Japanese Deming Prize and the manufacturing Futures Project among others. A weakness that cuts across the initiatives is that they are voluntary. While this might not be a truly scientifically selected sample there doesn't seem to be a listing of Kenyan firms that one might call representative of best practioners in various areas of strategy. The most common listing used in local MBA studies is the Kenya Industrial Research Development

Institute (KIRDI) which was considered inappropriate for this study because it lists all and sundry and indeed several listed firms have either closed shop due to the harsh economic climate in the country or are on the verge of doing so. Other useful criteria for choosing a sample that were considered included the various professional Association bodies' annual Company awards eg The Marketing Society of Kenya, The institute of Certified Public Accountants of Kenya (ICPAK), Architectural association of Kenya etc, however they were found to be too restricted to their industries and some did not have a large enough listing.

3.3 Data collection

The research relied on primary data, which was collect by way of a semi-structured questionnaire having both open-ended and closed questions. The closed ended questions enable collection of quantitative data for statistical analysis. The open-ended questions were aimed at gathering qualitative data on the respondent's view of strategic performance measurement practices in their firms and encouraging discussion. The target respondents were General managers/Managing directors and Operations / manufacturing managers because they are the ones involved in crafting strategies and the measurement systems. To achieve the objective of testing consensus the same questionnaire was be administered to both the General managers/Managing directors and Operations / manufacturing managers.

The questionnaire was piloted among ten managers drawn from the Executive MBA (Evening Class) at the university of Nairobi so as to refine by identifying and editing any errors that the researcher might have omitted or committed, such errors including ambiguity in phrasing of the questions so as to get the correct responses from the respondents. Their feedback was incorporated in the redesigned questionnaire.

Out of the sample forty companies targeted (*see appendix)* twenty-eight of them responded representing a seventy percent response rate.

3.4 Data analysis

The data collected was edited for accuracy, uniformity, consistency, and completeness and arranged to enable coding and tabulation before final analysis as recommended in Cooper and Emory, [1998]; Nachmias and Nachmias (1999] etc.. The data was then coded and cross-tabulated to enable the responses to be statistically analyzed.

Descriptive statistics were used to analyze data by way of percentages proportions and frequency distributions. These are appropriate because of the qualitative nature of such variables (see also similar studies Minja, 1995: Osewe 1998 and Maina 2001.

Being a survey we are not alleging causation. However the hypotheses set out in research question were tested by use of non-parametric statistics. Mann and Whitney's Wilcoxon matched paired signed test was be used to test whether significant differences exist in the rankings by the companies studied this is recommended by Kruger (1997). This test uses the signs and score ranks to test for significance of differences between any two priorities. To test for variability/consistency between the CEO and OM's rankings, the Kruskal Wallis test (*recommended in Nyamwange 2001*) was used to analyze differences if any. The test is recommended as a more robust alternative to the single factor analysis of variance and can be used to compare ranked scores from two or more treatment groups. The procedure is to rank scores irrespective of the respondents and averaging any tied ranks. Next the ranks are attributed to their appropriate groups and totaled giving a T-value. Group ranks are denoted as T_v T_j etc. the T-values used in this Kruskal-Wallis Formula produce a Chi-Square value. SPSS 10.0 for window was used to carry out the data manipulation

CHAPTER FOUR

4 ANALYSIS AND FINDINGS

4.1 General Characteristics of firms surveyed

The tabulated characteristics of the respondent firms are presented in tables1-. Classification was done according to such attributes as nature of manufacturing/ service operations; ownership; market for products; nature of operations process (through put) and annual turnover.

Table 4.1; company Ownership

Ownership	Frequency	Percentage	Cumulative frequency
Local	13	46	46
Foreign	8	29	75
Both local & foreign	7	25	100
Total	28	100	

Thirteen of the firms studied or 46.43 percent were local. Eight of them or 28.57 percent were foreign while seven or 25 percent are jointly owned (local and foreign).

Table 4.2 Nature of industry firm is involved

Industry classification	Frequency	Percentage	Cumulative frequency
Service / commercial	7	25	25
Manufacturing	10	36	61
NGO and Volunteer organizations	5	18	79
Agribusiness	3	11	9
Others	3	10	100
Total	28	100	

Twenty-five percent of the firms came from the service or commercial sector, thirty-five point seven one percent were from the manufacturing sector. NGO and volunteer organizations constituted seventeen point eight six percent of the companies studied. There were three companies or ten point seven percent from the agribusiness sector and other miscellaneous activities respectively.

Table 4.3 Nature of production processes

Industry classification	**Frequency**	**Percentage**	**Cumulative frequency**
Job shop	9	31%	31%
Batch	10	35%	66%
Continuous	6	23%	89%
Projects	2	7%	96%
Others	1	4%	100%
Total	28	100	

Table 4.4 Markets served

Industry classification	Frequency	Percentage	Cumulative frequency
Local	13	46%	46%
Regional	10	36%	82%
International	2	8%	90%
Global	3	10%	100.00
Total	28	100	

4.2 Discussion

4.2.1 Company mission

Companies were requested to highlight the key words in their mission statements. This is because the mission statement gives the strategic direction of an organization and captures top management's vision for the company. The core values that the firm espouses are also part of its mission statement.

The highlights in the responses obtained include; creating shareholders' wealth, Becoming market leaders, attaining world-class status, alleviating poverty, and creating a friendly and healthy environment.

Using resources efficiently, within the necessary period of time and with the required level of quality in order to fulfil the company's objectives. Incorporating best practices developed within the firm into individual activities. Foreseeing and resolving problems and incidents that arise in the workplace. Carefully following a code of ethics in all activities

With regard to customer service: most firms' aim at: Being aware of and satisfying customers' demands, Making an effort to exceed customers' expectations. Foreseeing potential problems, in order to avoid claims and complaints. Looking for satisfactory and efficient solutions for customers' claims and complaints.

The leading firms aim at developing an orientation towards change and Innovation, which requires: Maintaining a receptive and open attitude to possible changes in activity and new projects of the firm; promoting the necessary changes in order to fulfill established objectives; providing innovative solutions in order to improve the firm's processes, services or products, and presenting an innovative attitude in all professional activities.

ner core value sought by leading companies is Teamwork/Networking. Employees encouraged to actively contribute to the fulfillment of teams' objectives by bringing in their out of office experiences.

Take into account the various interests involved in negotiations, facilitating the resolution of conflicts within working teams.

Putting the interests of the Group ahead of those of units of lesser scope, when making decisions.

Knowing how to work in interdisciplinary teams, comprising different units, companies and cultures

Employees are encouraged to develop Initiative and leadership by; presenting a dynamic and positive attitude to work; taking the initiative in unforeseen situations; Promoting the leadership of co-workers and colleagues at all levels within the organization. Setting an example for co-workers and colleagues.

On innovation, the emphasis is on Orientation towards change and Innovative product and service ideas. Maintaining a receptive and open attitude to possible changes in activity and new projects of the firm. Promoting the necessary changes in order to fulfill established objectives.

Providing innovative solutions in order to improve the Firm's processes, services or products.

Presenting an innovative attitude in all professional activities

4.2.2 Belief as to whether operations strategy enhances competitiveness

The respondents were asked to rank their belief as to whether the operations function enhances the firm's competitiveness on a semantic 5-point Likert scale. The analyzed results on table below indicate that there was 100% consensus that indeed the operations function does enhance and generate performance excellence in their companies. The zero variance in the paired responses of CEO and MM/OM's indicate the two groups also agree. This finding concurs with a number of

leading theses on the import link between manufacturing / operations and strategy e.g. Skinner [1969, 1996] Voss [1995] Leong and Ward [1995] Hayes and Pissano [1996] among others.

4.3 sequence of pursuit of operations priorities

100% of the respondent indicated that they pursue their operations priorities simultaneously as opposed to trading off one for the other. Again this concurs with the assertion by such writers as terry Hill and Schonberger of the simultaneity school of thought.

4.3.1 Use of non-financial measures

Responses to this question indicate that the firms studied include both financial and no-financial measures in their annual reports. However there is a general feeling that the non-financial measures are more internally focused (for use within the organization) while financial measure are reported to the external publics.

4.4 Performance indices

This question sought the firms Key performance indices in the various categories clustered into the performance priorities. The responses are discussed below.

4.4.1 Measurement of the cost dimension

Firms are concerned about cost management, but most do not compete solely or even primarily on this basis. Choices about how they pursue marginal decreases in cost are generally technological in that they involve tradeoffs among capital, overhead, labor, and/or materials.

Advanced manufacturing technologies, including hardware, software, and management techniques, have changed the nature of tradeoffs especially for manufacturers. These changes have occurred

narily through "set up" efficiencies, which reduce the cost penalty of manufacturing short runs of tomized products relative to long runs of standardized products.

st of products is compared relative to competitors and benchmarked against industry averages. ncipal measures used by the firms studied revolve around measurement of factor iput ductivity, they include:- Manufacturing / operational cost e.g. overheads- Labor productivity l efficiency. Salary and Wage bills i.e. Direct and indirect labour costs Materials: Inventory: centage inventory: Machine productivity and equipment efficiency- Capital productivity Overall uipment Efficiency Percentage average set-uptime improvement per product line.

sign cost: Relative R&D expenditure

allenges faced by firms include: constant price fluctuations, poor infrastructure that keeps calating the cost of virtually everything, High/ punitive tax regime, fluctuations in interest rates at make borrowing and cost of money very high. Fluctuations in exchange rates that make portation of quality supplies expensive etc.

4.4.2 Measurement of the quality dimension

veral aspects of quality are sought- they generally revolve around Garvin's' eight dimensions of ality i.e. features, reliability, conformance, durability, serviceability, aesthetics and perceived ality. Firms traditionally focused on the conformance dimension of quality. Each of the other mensions of quality also represent possible bases of competition, but these other dimensions quire more inter-functional coordination among manufacturing, marketing, research and evelopment, and engineering than does achieving conformance quality.

Other variables commonly measured include: Responsiveness, Appearance, Cleanliness, Comfort, Friendliness, Communication, Courtesy, Competence, Access, Availability, and Security etc.

primarily through "set up" efficiencies, which reduce the cost penalty of manufacturing short runs of customized products relative to long runs of standardized products.

Cost of products is compared relative to competitors and benchmarked against industry averages. Principal measures used by the firms studied revolve around measurement of factor iput productivity, they include:- Manufacturing / operational cost e.g. overheads- Labor productivity and efficiency. Salary and Wage bills i.e. Direct and indirect labour costs Materials: Inventory: Percentage inventory: Machine productivity and equipment efficiency- Capital productivity Overall Equipment Efficiency Percentage average set-uptime improvement per product line.

Design cost: Relative R&D expenditure

Challenges faced by firms include: constant price fluctuations, poor infrastructure that keeps escalating the cost of virtually everything, High/ punitive tax regime, fluctuations in interest rates that make borrowing and cost of money very high. Fluctuations in exchange rates that make importation of quality supplies expensive etc.

4.4.2 Measurement of the quality dimension

Several aspects of quality are sought- they generally revolve around Garvin's' eight dimensions of quality i.e. features, reliability, conformance, durability, serviceability, aesthetics and perceived quality. Firms traditionally focused on the conformance dimension of quality. Each of the other dimensions of quality also represent possible bases of competition, but these other dimensions require more inter-functional coordination among manufacturing, marketing, research and development, and engineering than does achieving conformance quality.

Other variables commonly measured include: Responsiveness, Appearance, Cleanliness, Comfort, Friendliness, Communication, Courtesy, Competence, Access, Availability, and Security etc.

Four lead indicators identified are: Produced quality, perceived quality, Inbound (supply) quality and Quality costs.

Emphasis is put on attaining quality Right First Time (RFT). Indicators include: Customer satisfaction Attainment of quality awards e.g. Kenya Bureau of Standard Diamond Mark, ISO certification, awards by professional bodies eg Marketing society of Kenya (MSK) etc. Measurement of scrap – cost of non-quality Tests for components, sub-assemblies and finished products e.g. tolerances conformity to specs etc Fault analysis · "most likely reasons" for product failures Actual failure rates against target failure rates Complaints received against the quality assurance-testing programme

Customer satisfaction Percentage of surveyed customers satisfied Reputation in the market place Service call rate and client's response.

Defect level as perceived and measured by customers and analysis ofLead time reduction in time between defect detection and correction. Value of returned merchandise and Percentage of product returns or warranty claims further analysis of Mean time between failures (MTBF) is also done.

Up-time percentage (facilities utilizations percentages) Percentage unscheduled downtime reduction. The challenge here is in getting supplies that can deliver quality inputs at reasonable prices. Training staffers on the importance of maintaining high quality standards. Keeping up with changing customer demands.

4.4.3 Measurement of the flexibility dimension

The concern here is how the firm responds to various changes in the operating /market environment. Principal aspects of flexibility measured are: Volume flexibility, Product mix flexibility, Product and process mix flexibility Expansion flexibility

Lead-time and Cycle time (make time/total time) Production cycle time Extent to which quality is unaffected by mix/volume changes Extent to which cost is unaffected by mix/volume changes

Perceived relative product flexibility Number of part types and processes

Time to replace tools, change tools, assemble or move fixtures- general changeover time.

Percentage change of order without lead-time change Variability of Lot/ batch size- ability to customize smallest economical volume Ability to perform multiple tasks efficiently

Job classification: Percentage workforce cross-trained (doing more than one skilled job

Percentage increase in average number of direct labour skills and multipurpose equipment

Percentage of slack time for equipment, labour, etc. Disruption caused by breakdowns

Flexibility is a function of installed capacity. To maintain standards and better them often calls for more investment which most firms find taxing.

4.4.4 measurement of the reliability dimension

Delivery reliability is the ability to deliver according to a promised schedule. Here the firm may not have the least costly nor the highest quality product but is able to compete on the basis of reliably delivering products when promised, even if the promise date is far in the future. For some customers, delivery reliability is not enough; delivery speed is also necessary to win the order. Although the two dimensions are separable, long run success requires that promises of speedy delivery be kept with a high degree of reliability

The common dimensions are: product mix, volume and changeover. What is measured include; Perceived relative reliability; Reliability relative to competitors Percentage on-time delivery Production plan and due date adherence

Percentage increase in portion of delivery promises met, average delay. Percentage reduction in lead-time per product line/project and Percentage reduction in purchasing lead-time

Percentage increase in average number of direct labour skills and multipurpose equipment

This performance dimension is closely related to flexibility: Measures emphasized include: Delivery reliability and delivery Speed. Time from customer's recognition of need to delivery Response time Order processing time

Throughput time for Paperwork and Material, Number of changes in projects Engineering time Value added as percent of total elapsed time and Decision cycle time i.e. lost waiting for decisions New product introduction versus competition

Development time for new products from idea to market. Average time between innovations and product going live.

4.4.5 Measurement of the innovation dimension

The measures are designed to keep the company focused on creativity, product development, and improvement. Measures obtained include: Information availability for decision-making, Extent of reliability of management information. Quality Workforce: - percentage of employees meeting mandatory qualification standards. Audit of quality of working environment.

Performance of the innovation process, Performance of individual innovations, etc.

Good performance in innovation calls for investment in Research and Development. Progress is hampered by piracy and influx of cheap imitations especially from the Tiger economies. There is a booming black-market that the government and business associations should strive to eliminate through proper policing.

A point worthy noting is that those metrics that management have an interest in or follow up more frequently seem to be taken more seriously by the staffers especially where human resource performance evaluations and reward systems are tied to these measures.

4.5 Other significant issues

The two critical questions that need to be addresses in analyzing PMSs are, what to measure and How to measure. What to measure is answered by the list of competitive or performance priorities

while how to measure is more complicated because as we have seen above, the list of measures varies quite a great deal. It is affected by such variables as nature of industry and experiences of the management team. However, by focusing on four key factors with regard to the information needed to improve competitive performance i.e. possible sources of data, type of data collected, the reference base used and the location of the measure.

With regard to possible sources of data, a company can obtain measures of its performance strictly from internal data, which is what has been done historically. For example, quality can be measured internally by conformance to design specifications. Today, however, companies have begun to focus increasingly on the external environment. Quality is defined in terms of the customers' needs organizations have to be customer-driven. This shift has led to a realization that performance on competitive priorities must also be measured using data from external sources. For example, quality can be measured through such external measures as conformance to customers' needs, customer satisfaction, or repeat purchases. Several authors have noted this internal/external dichotomy and have recommended that organizations use both types of measures. Note that external measures can also focus on suppliers, competitors, or any other entity external to the organization.

Internal measures are usually easier to obtain, but they are myopic in the sense that they look only within the organization. External measures may be more difficult to obtain but provide valuable information. Feedback from customers can provide insights not available from internal sources and what is more consumer is king!.

With regard to data type the issue is whether the data used is subjective or objective Regardless whether data come from within or outside an organization, we can differentiate between two types of data: subjective and objective. Subjective measures are based on opinion or estimates, while objective measures are based on independently observable facts. Much of the information gathered from within a company -- and especially the information that has historically been collected for

performance measurement -- can be obtained in the form of objective data. As companies have moved to external sources of information they have found much of that information involves people's opinions, such as customer perceptions of product quality or competitor evaluations of company strengths. For example, Nemetz [80] found in her research efforts that: "Because of the virtual nonexistence of accurate, standard, and objective performance data, and the practical difficulties associated with attempting to gather it, it was necessary to rely on perceptual performance measures for the research".

When performance measurement information is being collected with the purpose of improving performance, both objective and subjective data are needed. Objective measures have the advantage of not being biased by whoever is providing the opinion or estimate. For example, a company that manufactures personal computers might measure the percentage of units produced that boot up correctly. This would be an objective measure. Conversely, subjective measures provide a wealth and variety, which is not often obtainable from objective, measures alone and are often unavoidable when data are being collected externally. If the computer manufacturer wants to know whether its product meets the needs of customers, subjective data may be required. Such subjective data might include perceptions about how easy the computer is to use or even how comfortable its keyboard is to type on.

Concerning the issue of what Reference should be used an essential question one must ask relates to how the data will be used in evaluating performance. A particular measure is of little value by itself; it must be compared against some reference value to be meaningful. In other words, we ask the question, "What is the frame of reference?" One reference frame involves comparisons within the organization –self-reference. For instance a firm may want to see how its labour costs change over time. Such a measure is self-referenced. Today, however, it seems unlikely that any company can afford to measure its manufacturing performance by internal standards alone self-referenced

measures indicating excellent performance can mean nothing if the competition has upped the ante to a new, higher, level of required performance. Comparing a firm's own performance with that of non-competitor organizations that are recognized for excellence in a particular activity also provides useful information. Such comparison requires the use of benchmark measures.

The last issue is whether nature of Process orientation: input or outcome another essential measurement question to be dealt with is the location where measurement occurs. The issue of internal versus external data source partially answered this question. However, data can still be collected from several places within an organization. The focus here on whether data are collected as a process input or process outcome. Measures of business performance have traditionally been based on accounting data. Because these data are collected after the fact, they tend to measure process outcomes. However, recent developments indicate that measurement of process inputs can also be important.

For instance, Michael Hammer [quoted in White, 1996] relates the story of Ford's efforts to reduce its accounts payable staff from 500 to 400 people until it learned that Mazda did the same job with just five employees. Ford had been focusing only on the outcomes, which included the payment of suppliers and the cost incurred in doing so. When the process inputs were analyzed, Ford found they included 14 different data items, which had to be matched for each separate order. This led to the realization that one unintended outcome was a large percentage of time spent investigating items that did not match.

CHAPTER FIVE

5 SUMMARY AND RECOMMENDATIONS

5.1 CONCLUSIONS

The theory of operations strategy has undergone tremendous evolution and as we have seen for a business to succeed it needs to invest in an integrated performance measurement system. As evidence from the literature review points out considerable multidisciplinary research is going on in various aspect of corporate performance measurement. The amount of discourse and research output evidenced by the copious amounts of refereed journal articles and texts dedicated to this topical issue. These researches, which are predominantly from the western countries, tend to agree that the nature of competition is perpetually evolving and becoming more aggressive. From the literature it is worthy noting that, Successful firms whose strategies are documented in case studies have recognized the important role that operations should play in both generating and supporting superior competitive advantage. They have de-emphasized traditional financial measures and adopted the more proactive integrated no-financial measures that focus more on strategy and competitive priorities- they measure the entire process from inputs thro' throughput to output as opposed to just measuring the outcomes.

The approach by world-class companies to competitive strategy is customer driven. To be leaders in the marketplace they approach the issue of performance measurement by taking a critical look at who the key stakeholders are, what are their needs and expectations? What strategies do they have to put in place to satisfy the wants and needs of these key stakeholders? What critical processes do they require if they are to execute the strategies, what capabilities do they need to operate and enhance these processes and what contributions do they require from the stakeholders so as to maintain and develop these capabilities?

This project had the threefold objectives of; finding out how leading Kenyan firms link their operations strategies to performance measurement, and hence the extent of adoption of emerging integrated PMSs; To test whether there is consensus as to what Chief executives and operations/manufacturing managers consider to be important performance priorities, their rankings and consequently which performance metrics are emphasized; and lastly to document the challenges associated with developing comprehensive strategic performance measurement systems.

The findings point to the fact that successful Kenyan firms have fully recognized the importance of the operations function in both generating and supporting overall business performance excellence. They recognize the need to pursue all the operations strategy priorities (quality, cost, flexibility, time/delivery speed and innovation) simultaneously as opposed to trading off one for the other. The differences in rankings could be attributable to what constitutes order winners and order qualifiers in the industries and markets that the firms operate in. These firms have integrated the emerging non-financial performance measures into their performance measurement systems, however there is still strong emphasis on financial indicators and reports.

On the development of strategies, the firms studied have adopted the cumulative or simultaneity approach as opposed to the trade-offs approach. Quality and cost are largely identified as order winning criteria while Delivery Speed and flexibility and reliability are identified as order winners. A number of respondents argued that the Kenyan market is still quite price sensitive and Cost at times becomes an order winner.

We have seen that successful companies invest in formal strategic planning. They strive to align business strategy, operations strategy and other functional strategies. That alignment is developed by obtaining consensus from the various functional areas as to what performance objectives are

important in achieving the firm's mission. After the consensus is reached, the question then becomes how do they measure these aspects of strategy?

Having underscored the importance of the operations function in business strategy, it is therefore imperative that organizations striving to succeed especially the small and medium (micro) enterprises (SMEs) have a leaf to borrow from the successful companies in formal design, implementation and measurement of strategy.

The question therefore becomes, how do the theories and tools developed in production and operations management help the small entrepreneur improve on his competitiveness and enhance his business success?

5.2 LIMITATIONS OF THE STUDY

The study does suffer from a number of limitations, which should be borne in mind when interpreting the findings and conclusions drawn therefrom. First and foremost the sample used was a convenience sample in the absence of a truly scientific way of obtaining a listing of firms that are best practioners in their various industries. . The findings are based on responses by only twenty-eight firms making it a small sample. A number of firms failed to respond while in others the respondents at times did not quite have a grasp of the theoretical issues that are pervasive in the literature. The researcher had a time limitation because the questionnaire was designed as an interview guide so as mitigate against the deficiency of questionnaire based researches like wrong interpretation of questions. And the need for more clarifications.

5.3 SUGGESTIONS FOR FURTHER RESEARCH.

There is need therefore for studies to look at how the smaller firms that do not have the resources of the larger firms can also design appropriate strategic performance measures to enable them compete given that a majority of Kenyan firms are *Jua-Kali* or small and medium sized.

There is need also for more longitudinal studies on how the PMSs of these firms have evolved over time.

Specific measures of the various performance priority areas still need to be more documented especially on a more detailed cased-study format so that we can benefit form the rigor and detail of how particular companies have developed their priorities and measurement systems for their chosen strategies.

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Appendix I sample / Respondents

1) Aga Khan Hospital
2) Apollo Insurance Co. Ltd :
3) Atlas Copco Kenya Ltd
4) Bidco Oil Refineries
5) BOC (K) Ltd
6) Chandaria Industries Ltd
7) CITI Bank N.A
8) Davis & Shirtliff Ltd
9) East Africa Breweries
10) Gailey & Roberts
11) Genesis Community Dev.
12) Gina Din Corporate Comm.
13) Grand Regency Hotel
14) INCA
15) Industrial Development Bank ITDG
16) Kenol / Kobil Kenya-*incomplete*
17) Kenya Airways
18) Kenya Vehicle Manufacturers
19) Kodak Kenya
20) Lubeschem Kenya Ltd.
21) Mabati Rolling mills – *One set*
22) Mission for Essential Drugs
23) Mumias Sugar Company-
24) Nairobi Hospital
25) Power Techniques Ltd.
26) Skills Across Kenya
27) Serena Hotels & Lodges
28) Glaxo-SmithKline Int.
29) Sony Sugar Company Ltd.
30) Spinners & Spinners Ltd.

* two questionnaire sets were declared incomplete for analysis

Test Statistics[b]

	QLTY2 - QLTY1	COST2 - COST1	DEL2 - DEL1	FLEX2 - FLEX1	INNOV2 - INNOV1	TECH2 - TECH1
Exact Sig. (2-tailed)	1.000[a]	.727[a]	.001[a]	.481[a]	.004[a]	.021[a]

a. Binomial distribution used.

b. Sign Test

T-Test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	QLTY1	4.8571	28	.4484	8.474E-02
	QLTY2	4.8214	28	.4756	8.988E-02
Pair 2	COST1	4.5714	28	.5727	.1082
	COST2	4.6786	28	.6696	.1265
Pair 3	DEL1	4.5000	28	.5092	9.623E-02
	DEL2	3.7857	28	.7382	.1395
Pair 4	FLEX1	4.3571	28	.5587	.1056
	FLEX2	4.1786	28	.8189	.1548
Pair 5	INNOV1	4.3571	28	.5587	.1056
	INNOV2	3.8571	28	.6506	.1230
Pair 6	TECH1	4.1429	28	.5245	9.913E-02
	TECH2	3.7500	28	.7005	.1324

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	QLTY1 & QLTY2	28	.223	.253
Pair 2	COST1 & COST2	28	.497	.007
Pair 3	DEL1 & DEL2	28	.099	.618
Pair 4	FLEX1 & FLEX2	28	.260	.181
Pair 5	INNOV1 & INNOV2	28	.247	.204
Pair 6	TECH1 & TECH2	28	.302	.118

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	QLTY1 - QLTY2	3.571E-02	.5762	.1089	-.1877	.2591	.328	27	.745
Pair 2	COST1 - COST2	-.1071	.6289	.1188	-.3510	.1367	-.902	27	.375
Pair 3	DEL1 - DEL2	.7143	.8545	.1615	.3829	1.0456	4.423	27	.000
Pair 4	FLEX1 - FLEX2	.1786	.8630	.1631	-.1561	.5132	1.095	27	.283
Pair 5	INNOV1 - INNOV2	.5000	.7454	.1409	.2110	.7890	3.550	27	.001
Pair 6	TECH1 - TECH2	.3929	.7373	.1393	.1070	.6788	2.819	27	.009

Analysis Q2.3

	Qlty1	Qlty2
t Stat	0. 327978	

	Cost	Cost2

	Flex1	Flex2

	Del1	Del2
t Stat	-0.225	

	Innov1	Innov2

	Tech1	Tech2

Ranks

		N	Mean Rank	Sum of Ranks
QLTY2 - QLTY1	Negative Ranks	3[a]	4.00	12.00
	Positive Ranks	3[b]	3.00	9.00
	Ties	22[c]		
	Total	28		
COST2 - COST1	Negative Ranks	3[d]	4.00	12.00
	Positive Ranks	5[e]	4.80	24.00
	Ties	20[f]		
	Total	28		
DEL2 - DEL1	Negative Ranks	19[g]	11.82	224.50
	Positive Ranks	3[h]	9.50	28.50
	Ties	6[i]		
	Total	28		
FLEX2 - FLEX1	Negative Ranks	11[j]	9.82	108.00
	Positive Ranks	7[k]	9.00	63.00
	Ties	10[l]		
	Total	28		
INNOV2 - INNOV1	Negative Ranks	16[m]	10.09	161.50
	Positive Ranks	3[n]	9.50	28.50
	Ties	9[o]		
	Total	28		
TECH2 - TECH1	Negative Ranks	13[p]	8.62	112.00
	Positive Ranks	3[q]	8.00	24.00
	Ties	12[r]		
	Total	28		

a. QLTY2 < QLTY1
b. QLTY2 > QLTY1
c. QLTY1 = QLTY2
d. COST2 < COST1
e. COST2 > COST1
f. COST1 = COST2
g. DEL2 < DEL1
h. DEL2 > DEL1
i. DEL1 = DEL2
j. FLEX2 < FLEX1
k. FLEX2 > FLEX1
l. FLEX1 = FLEX2
m. INNOV2 < INNOV1
n. INNOV2 > INNOV1
o. INNOV1 = INNOV2
p. TECH2 < TECH1
q. TECH2 > TECH1
r. TECH1 = TECH2

Test Statistics

	QLTY2 - QLTY1	COST2 - COST1	EL2 - DEL	FLEX2 - FLEX1	NNOV2 - INNOV1	TECH2 - TECH1
Z	-.333[a]	-.905[b]	-3.409[a]	-1.091[a]	-2.985[a]	-2.524[a]
Asymp. Sig. (2-t	.739	.366	.001	.275	.003	.012

a. Based on positive ranks.

b. Based on negative ranks.

c. Wilcoxon Signed Ranks Test

Sign Test

Frequencies

			N
QLTY2 - QLTY1	Negative Differences	a,b,	3
	Positive Differences	g,h,i,j,	3
	Ties	m,n,o,p,q,r	22
	Total		28
COST2 - COST1	Negative Differences	a,b,	3
	Positive Differences	g,h,i,j,	5
	Ties	m,n,o,p,q,r	20
	Total		28
DEL2 - DEL1	Negative Differences	a,b,	19
	Positive Differences	g,h,i,j,	3
	Ties	m,n,o,p,q,r	6
	Total		28
FLEX2 - FLEX1	Negative Differences	a,b,	11
	Positive Differences	g,h,i,j,	7
	Ties	m,n,o,p,q,r	10
	Total		28
INNOV2 - INNOV1	Negative Differences	a,b,	16
	Positive Differences	g,h,i,j,	3
	Ties	m,n,o,p,q,r	9
	Total		28
TECH2 - TECH1	Negative Differences	a,b,	13
	Positive Differences	g,h,i,j,	3
	Ties	m,n,o,p,q,r	12
	Total		28

a. QLTY2 < QLTY1
b. COST2 < COST1
c. DEL2 < DEL1
d. FLEX2 < FLEX1
e. INNOV2 < INNOV1
f. TECH2 < TECH1
g. QLTY2 > QLTY1
h. COST2 > COST1
i. DEL2 > DEL1
j. FLEX2 > FLEX1
k. INNOV2 > INNOV1
l. TECH2 > TECH1
m. QLTY1 = QLTY2
n. COST1 = COST2
o. DEL1 = DEL2
p. FLEX1 = FLEX2
q. INNOV1 = INNOV2
r. TECH1 = TECH2

Test Statistics[b]

	QLTY2 - QLTY1	COST2 - COST1	DEL2 - DEL1	FLEX2 - FLEX1	INNOV2 - INNOV1	TECH2 - TECH1
Exact Sig. (2-tailed)	1.000[a]	.727[a]	.001[a]	.481[a]	.004[a]	.021[a]

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Pair 4	FLEX1 & FLEX2	28	.260	.181
Pair 5	INNOV1 & INNOV2	28	.247	.204
Pair 6	TECH1 & TECH2	28	.302	.118

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	QLTY1 - QLTY2	3.571E-02	.5762	.1089	-.1877	.2591	.328	27	.745
Pair 2	COST1 - COST2	-.1071	.6289	.1188	-.3510	.1367	-.902	27	.375
Pair 3	DEL1 - DEL2	.7143	.8545	.1615	.3829	1.0456	4.423	27	.000
Pair 4	FLEX1 - FLEX2	.1786	.8630	.1631	-.1561	.5132	1.095	27	.283
Pair 5	INNOV1 - INNOV2	.5000	.7454	.1409	.2110	.7890	3.550	27	.001
Pair 6	TECH1 - TECH2	.3929	.7373	.1393	.1070	.6788	2.819	27	.009

Analysis Q3.5

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	CUST.1	1.0000[a]	28	.0000	.0000
	CUST.2	1.0000[a]	28	.0000	.0000
Pair 2	EMPLY.1	1.0000	28	.0000	.0000
	EMPLOY.2	1.2143	28	.4179	7.897E-02
Pair 3	REGUL.1	1.0714	28	.2623	4.956E-02
	REGUL.2	2.0000	28	.6667	.1260
Pair 4	SUPPL.1	1.2500	28	.4410	8.333E-02
	SUPPL.2	1.6071	28	.7860	.1485
Pair 5	INVEST.1	1.0000	28	.0000	.0000
	INVEST.2	1.3214	28	.5480	.1036

a. The correlation and t cannot be computed because the standard error of the difference is 0.

Paired Samples Correlations

		N	Correlation	Sig.
Pair 2	EMPLY.1 & EMPLOY.2	28	.	.
Pair 3	REGUL.1 & REGUL.2	28	.000	1.000
Pair 4	SUPPL.1 & SUPPL.2	28	.080	.685
Pair 5	INVEST.1 & INVEST.2	28	.	.

NOTES:

The paired responses relate to paired responses of CEOs and MM/OM's to Q 3.5 the relative importance they give to Customers, Employees, Regulators, Suppliers and investors.

CUST.1 = CEOs response as to importance of customer related measures
CUST.2 = MM/OM's response as to importance of customer related measures
See note a above

EMPLY.1 = CEOs response as to importance of employee related measures
EMPLY.2 = MM/OM's response as to importance of employee related measures

REGUL.1 = CEOs response as to importance of regulators and government related measures
REGUL.2 = MM/OM's response as to importance of regulators and government related measures
SUPPL1.,2 and INVEST.1 ., 2 relate to responses with regard to supplier and investor related measures form the CEOs' and MMs respectively

Descriptive Statistic

NATINDU		N	Mean	Std Deviatio	Minimum	Maximum
1.0	CUST.		1.000	.000	1.0	1.0
	EMPLY.		1.000	.000	1.0	1.0
	REGUL.		1.000	.000	1.0	1.0
	SUPPL.		1.000	.000	1.0	1.0
	INVEST.		1.000	.000	1.0	1.0
	CUST.		1.000	.000	1.0	1.0
	EMPLOY.2		1.000	.000	1.0	1.0
	REGUL.		2.000	.816	1.0	3.0
	SUPPL.		1.285	.488	1.0	2.0
	INVEST.		1.571	.786	1.0	3.0
2.0	CUST.	1	1.000	.000	1.0	1.0
	EMPLY.	1	1.000	.000	1.0	1.0
	REGUL.	1	1.100	.316	1.0	2.0
	SUPPL.	1	1.500	.527	1.0	2.0
	INVEST.	1	1.000	.000	1.0	1.0
	CUST.	1	1.000	.000	1.0	1.0
	EMPLOY.2	1	1.400	.516	1.0	2.0
	REGUL.	1	1.900	.567	1.0	3.0
	SUPPL.	1	1.600	.843	1.0	3.0
	INVEST.	1	1.400	.516	1.0	2.0
3.0	CUST.	5	1.000	.000	1.0	1.0
	EMPLY.	5	1.000	.000	1.0	1.0
	REGUL.	5	1.000	.000	1.0	1.0
	SUPPL.	5	1.000	.000	1.0	1.0
	INVEST.	5	1.000	.000	1.0	1.0
	CUST.	5	1.000	.000	1.0	1.0
	EMPLOY.2	5	1.000	.000	1.0	1.0
	REGUL.	5	2.200	.836	1.0	3.0
	SUPPL.	5	1.600	.894	1.0	3.0
	INVEST.	5	1.000	.000	1.0	1.0
4.0	CUST.	3	1.000	.000	1.0	1.0
	EMPLY.	3	1.000	.000	1.0	1.0
	REGUL.	3	1.333	.577	1.0	2.0
	SUPPL.	3	1.666	.577	1.0	2.0
	INVEST.	3	1.000	.000	1.0	1.0
	CUST.	3	1.000	.000	1.0	1.0
	EMPLOY.2	3	1.666	.577	1.0	2.0
	REGUL.	3	1.666	.577	1.0	2.0
	SUPPL.	3	2.333	1.154	1.0	3.0
	INVEST.	3	1.333	.577	1.0	2.0
5.0	CUST.	3	1.000	.000	1.0	1.0
	EMPLY.	3	1.000	.000	1.0	1.0
	REGUL.	3	1.000	.000	1.0	1.0
	SUPPL.	3	1.000	.000	1.0	1.0
	INVEST.	3	1.000	.000	1.0	1.0
	CUST.	3	1.000	.000	1.0	1.0
	EMPLOY.2	3	1.000	.000	1.0	1.0
	REGUL.	3	2.333	.577	2.0	3.0
	SUPPL.2	3	1.666	.577	1.0	2.0

Test Statistics[c]

NATINDU		CUST.2 - CUST.1	EMPLOY.2 - EMPLY.1	REGUL.2 - REGUL.1	SUPPL.2 - SUPPL.1	NVEST.2 - INVEST.1
1.00	Z	.000[a]	.000[a]	-2.070[b]	-1.414[b]	-1.633[b]
	Asymp. Sig. (2-tail	1.000	1.000	.038	.157	.102
2.00	Z	.000[a]	-2.000[b]	-2.530[b]	-.333[b]	-2.000[b]
	Asymp. Sig. (2-tail	1.000	.046	.011	.739	.046
3.00	Z	.000[a]	.000[a]	-1.857[b]	-1.342[b]	.000[a]
	Asymp. Sig. (2-tail	1.000	1.000	.063	.180	1.000
4.00	Z	.000[a]	-1.414[b]	-1.000[b]	-.816[b]	-1.000[b]
	Asymp. Sig. (2-tail	1.000	.157	.317	.414	.317
5.00	Z	.000[a]	.000[a]	-1.633[b]	-1.414[b]	.000[a]
	Asymp. Sig. (2-tail	1.000	1.000	.102	.157	1.000

a. The sum of negative ranks equals the sum of positive ranks.

b. Based on negative ranks.

c. Wilcoxon Signed Ranks Test

Notes:
NATUINDUS refers to the nature of the industry that the respondent firm operates in

1. Service/Commercial Sector
2. Manufacturing sector
3. NGOs' and Volunteer organizations.
4. Agri – Business
5. Others

Report

		NATINDUS					
		1.00	2.00	3.00	4.00	5.00	Total
Mean	CUST.1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	CUST.2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	EMPLY.1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	EMPLOY.2	1.0000	1.4000	1.0000	1.6667	1.0000	1.0000
	REGUL.1	1.0000	1.1000	1.0000	1.3333	1.0000	1.0000
	REGUL.2	2.0000	1.9000	2.2000	1.6667	2.3333	2.3333
	SUPPL.1	1.0000	1.5000	1.0000	1.6667	1.0000	1.0000
	SUPPL.2	1.2857	1.6000	1.6000	2.3333	1.6667	1.6667
	INVEST.1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	INVEST.2	1.5714	1.4000	1.0000	1.3333	1.0000	1.0000
N	CUST.1	7	10	5	3	3	3
	CUST.2	7	10	5	3	3	3
	EMPLY.1	7	10	5	3	3	3
	EMPLOY.2	7	10	5	3	3	3
	REGUL.1	7	10	5	3	3	3
	REGUL.2	7	10	5	3	3	3
	SUPPL.1	7	10	5	3	3	3
	SUPPL.2	7	10	5	3	3	3
	INVEST.1	7	10	5	3	3	3
	INVEST.2	7	10	5	3	3	3
Std. Deviation	CUST.1	.0000	.0000	.0000	.0000	.0000	.0000
	CUST.2	.0000	.0000	.0000	.0000	.0000	.0000
	EMPLY.1	.0000	.0000	.0000	.0000	.0000	.0000
	EMPLOY.2	.0000	.5164	.0000	.5774	.0000	.0000
	REGUL.1	.0000	.3162	.0000	.5774	.0000	.0000
	REGUL.2	.8165	.5676	.8367	.5774	.5774	.5774
	SUPPL.1	.0000	.5270	.0000	.5774	.0000	.0000
	SUPPL.2	.4880	.8433	.8944	1.1547	.5774	.5774
	INVEST.1	.0000	.0000	.0000	.0000	.0000	.0000
	INVEST.2	.7868	.5164	.0000	.5774	.0000	.0000

Notes:
These are summary statistics on how clusters of firms from the various industry sectors ranked measures related to Customers, employees, regulators and Governments, suppliers and Investors.

Ranks

NATINDUS			N	Mean Rank	Sum of Ranks
1.00	CUST.2 - CUST.1	Negative Ranks	1[a]	.00	.00
		Positive Ranks	0[b]		
		Ties	7[c]		
		Total	7		
	EMPLOY.2 - EMPLY.1	Negative Ranks	0[d]	.00	.00
		Positive Ranks	0[e]		
		Ties	7[f]		
		Total	7		
	REGUL.2 - REGUL.1	Negative Ranks	0[g]	.00	.00
		Positive Ranks	5[h]	3.00	15.00
		Ties	2[i]		
		Total	7		
	SUPPL.2 - SUPPL.1	Negative Ranks	0[j]	.00	.00
		Positive Ranks	3[k]	1.00	3.00
		Ties	4[l]		
		Total	7		
	INVEST.2 - INVEST.1	Negative Ranks	0[m]	.00	.00
		Positive Ranks	3[n]	2.00	6.00
		Ties	4[o]		
		Total	7		
2.00	CUST.2 - CUST.1	Negative Ranks	0[p]	.00	.00
		Positive Ranks	0[q]	.00	.00
		Ties	10[r]		
		Total	10		
	EMPLOY.2 - EMPLY.1	Negative Ranks	0[s]	.00	.00
		Positive Ranks	4[t]	2.50	10.00
		Ties	6[u]		
		Total	10		
	REGUL.2 - REGUL.1	Negative Ranks	0[v]	.00	.00
		Positive Ranks	7[w]	4.00	28.00
		Ties	3[x]		
		Total	10		
	SUPPL.2 - SUPPL.1	Negative Ranks	0[y]	.00	.00
		Positive Ranks	3[z]	4.00	12.00
		Ties	4[aa]		
		Total	10		
	INVEST.2 - INVEST.1	Negative Ranks	0[ab]	.00	.00
		Positive Ranks	4[ac]	2.50	10.00
		Ties	6[ad]		
		Total	10		
3.00	CUST.2 - CUST.1	Negative Ranks	0[ae]	.00	.00
		Positive Ranks	0[af]	.00	.00
		Ties	8[ag]		
		Total	8		
	EMPLOY.2 - EMPLY.1	Negative Ranks	0[ah]	.00	.00
		Positive Ranks	0[ai]	.00	.00
		Ties	8[aj]		
		Total	8		
	REGUL.2 - REGUL.1	Negative Ranks	0[ak]	.00	.00
		Positive Ranks	4[al]	2.50	10.00
		Ties	1[am]		
		Total	5		
	SUPPL.2 - SUPPL.1	Negative Ranks	0[an]	.00	.00
		Positive Ranks	2[ao]	1.50	3.00
		Ties	3[ap]		
		Total	5		
	INVEST.2 - INVEST.1	Negative Ranks	0[aq]	.00	.00
		Positive Ranks	0[ar]	.00	.00
		Ties	5[as]		
		Total	5		
4.00	CUST.2 - CUST.1	Negative Ranks	0[at]	.00	.00
		Positive Ranks	0[au]	.00	.00
		Ties	3[av]		
		Total	3		
	EMPLOY.2 - EMPLY.1	Negative Ranks	0[aw]	.00	.00
		Positive Ranks	2[ax]	1.50	3.00
		Ties	1[ay]		
		Total	3		
	REGUL.2 - REGUL.1	Negative Ranks	0[az]	.00	.00
		Positive Ranks	1[ba]	1.00	1.00
		Ties	2[bb]		
		Total	3		
	SUPPL.2 - SUPPL.1	Negative Ranks	1[bc]	1.50	1.50
		Positive Ranks	2[bd]	2.25	4.50
		Ties	0[be]		
		Total	3		
	INVEST.2 - INVEST.1	Negative Ranks	0[bf]	.00	.00
		Positive Ranks	1[bg]	1.00	1.00
		Ties	2[bh]		
		Total	3		
5.00	CUST.2 - CUST.1	Negative Ranks	0[bi]	.00	.00
		Positive Ranks	0[bj]	.00	.00
		Ties	3[bk]		
		Total	3		
	EMPLOY.2 - EMPLY.1	Negative Ranks	0[bl]	.00	.00
		Positive Ranks	0[bm]	.00	.00
		Ties	3[bn]		
		Total	3		
	REGUL.2 - REGUL.1	Negative Ranks	0[bo]	.00	.00
		Positive Ranks	3[bp]	2.00	6.00
		Ties	0[bq]		
		Total	3		
	SUPPL.2 - SUPPL.1	Negative Ranks	0[br]	.00	.00
		Positive Ranks	2[bs]	1.50	3.00
		Ties	1[bt]		
		Total	3		
	INVEST.2 - INVEST.1	Negative Ranks	0[bu]	.00	.00
		Positive Ranks	0[bv]	.00	.00
		Ties	3[bw]		
		Total	3		

a. CUST.2 < CUST.1
b. CUST.2 > CUST.1
c. CUST.1 = CUST.2
d. EMPLOY.2 < EMPLY.1
e. EMPLOY.2 > EMPLY.1

Q3.9

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PORTF1	4.8571	28	.4484	8.474E-02
	PORTF2	4.8214	28	.4756	8.988E-02
Pair 2	OBJDEF1	4.5714	28	.5727	.1082
	OBJDEF2	4.6786	28	.6696	.1265
Pair 3	TANG1	4.5000	28	.5092	9.623E-02
	TANGI2	3.7857	28	.7382	.1395
Pair 4	DEPTAL1	4.3571	28	.5587	.1056
	DEPTAL2	4.1786	28	.8189	.1548
Pair 5	DEPTAL1	4.3571	28	.5587	.1056
	DEPTAL2	4.1786	28	.8189	.1548
Pair 6	ALIGN1	4.3571	28	.5587	.1056
	ALIGN2	3.8571	28	.6506	.1230
Pair 7	PMSSUP1	4.1429	28	.5245	9.913E-02
	PMSSUP2	3.7500	28	.7005	.1324

NOTES:

The question-sought responses with to questions related to particular aspects or elements or aspects of integrated performance measures. These were indirect questions to judge their belief and objective judgment as to how their firms fare in implementing some of the practices highlighted in the PMSs.

1s eg PORT1, OBJE1 etc refer to the CEOs responses

2s eg PORT2, TANG2 etc refer to MMs/OMs responses.

PORT i,j refers to evaluation of the firms' performance with regards to :Management has assigned a corporate portfolio role to each business unit and allocates resources to support them.

OBJDEF i,j: refers to evaluation of the firms' performance with regards to whether - Objectives for each business unit are defined in market and financial terms

TANG i;j: refers to evaluation of the firms' performance with regards to whether: Tangible operating objectives and priorities can be defined for each business operating system in terms of customer satisfaction, flexibility and productivity

DEPTAL i,j: At the departmental level, customer satisfaction, flexibility and productivity are represented by specific operational criteria: quality, delivery, process time and cost

ALIGN il,j: refers to evaluation of the firms' performance with regards to :Frequent Alignment analysis is conducted to investigate in general terms how well the company's actions and measures complement its strategy.

PMSSUP i, j:- How well does the measurement system supports an organizations actions and strategy.

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	PORTF1 - PORTF2	3.571E-02	.5762	.1089	-.1877	.2591	.328	27	.745
Pair 2	OBJDEF1 - OBJDEF2	-.1071	.6289	.1188	-.3510	.1367	-.902	27	.375
Pair 3	TANG1 - TANGI2	.7143	.8545	.1615	.3829	1.0456	4.423	27	.000
Pair 4	DEPTAL1 - DEPTAL2	.1786	.8630	.1631	-.1561	.5132	1.095	27	.283
Pair 5	DEPTAL1 - DEPTAL2	.1786	.8630	.1631	-.1561	.5132	1.095	27	.283
Pair 6	ALIGN1 - ALIGN2	.5000	.7454	.1409	.2110	.7890	3.550	27	.001
Pair 7	PMSSUP1 - PMSSUP2	.3929	.7373	.1393	.1070	.6788	2.819	27	.009

Strategic performance measurement systems survey.

Appendix 1 Research questionnaire

DECLARATION this is an academic research project aimed at understanding how your company and other companies in Kenya design strategic performance measurement systems. There are no wrong or right answers and the results are confidential for academic use. Thank you in advance for taking your time to participate.

Nb. Where applicable please copy and paste the check sign against your responses [√]

Part 1 Company profile

Company Name:

1.1 Respondents title/position:

- MD / GENERAL MANAGER (or equivalent)
- OPERATIONS /MANUFACTURING MANAGER (or equivalent)

1.2 Company ownership:

a. Local [ ] b. Foreign[ ] c. Both

1.3 Nature of industry / market the firm is involved

1. Service/Commercial Sector
2. Manufacturing sector
3. NGOs' and Volunteer organizations.
4. Agri – Business
5. Other (please specify)

1.4 Nature of products / operations process

a. Batch
b. Continuous
c. Project
d. Other (please specify)

1.5 Market

1. Local
2. Regional
3. International
4. Other

1.6 Turnover

1. < Ksh 50m
2. Ksh50m< x>500m
3. Ksh500m< x>1Kshbn
4. > 1Ksh bn

Part 2 operations strategy

2.1 What is your company mission? (*Please highlight the key words and core values.)*

2.2 Do you consider the operations/manufacturing function important in enhancing your company's competitiveness?

(Please rank on a scale of 1 to 5 where: *1 = very important.....= not very important)*

.....

- **Ranking of operations priorities**

2.3 Please rank the following priorities on a scale of 1 to 5 (1 = Very important. 5 = not important)

		1	2	3	4	5
i.	Quality of product / service	☐	☐	☐	☐	☐
ii.	Cost	☐	☐	☐	☐	☐
iii.	Flexibility	☐	☐	☐	☐	☐
iv.	Time/ delivery speed	☐	☐	☐	☐	☐
v.	Innovativeness and learning	☐	☐	☐	☐	☐
vi.	Technology	☐	☐	☐	☐	☐
vii.	Others (please specify					

Order of priority development

2.3.1 Briefly discuss how you go about developing the priorities (i.e. do you develop one after the other or you pursue them simultaneously? .....

- What challenges do you face in your chosen part (refer to 2.3.1 above)

Part 3 Performance measurement

3.1 Do your annual performance reports include both financial and non-financial performance measures? YES [ ] NO [ ]

3.2 What are your company's Key performances Indices (KPI's)? *Please list*

.....

3.3 How often do you generate reports on these KPI's?

.....

3.4 Please indicate the **specific performance indicators** that you report to the groups listed below.

i. Customers and intermediaries.....

ii. Employees.....

.....

iii. Suppliers.....

....

iv. Regulators and communities .....

.....

v. Investors .....

vi. Others (please specify).....

3.5 What relative importance do you give to the indicators made to the following groups?

Group	Importance Rank (1 = Very important 5 = not important)				
	1	**2**	**3**	**4**	**5**
i. Customers and intermediaries	{}	{}	{}	{}	{}
ii. Employees	{}	{}	{}	{}	{}
iii. Suppliers	{}	{}	{}	{}	{}
iv. Regulators and communities	{}	{}	{}	{}	{}
v. Investors	{}	{}	{}	{}	{}

vi. Others ie ... {} {} {} {} {}

3.6 Do you have specific performance measures for the following objectives (Please indicate which specific measures exist)

i. Quality of product / service.....

ii. Cost.....
.....

iii. Flexibility.....
.....

iv. Time/ delivery speed.....

v. Innovativeness and learning and .....

vi. Others eg Technology (please specify.....

3.7 what specific problems do you encounter in measuring the above variables? Refer 3.6).....

3.8 How do your measures above help your firm to link business strategy to operations strategy? .....

3.9 *ON A FIVE POINT SCORING SCALE (WHERE 1 = LOWEST, AND 5 = HIGHEST)*
OR ***1*** = SA - Strongly Disagree, **2**=FA – Fairly Disagree **3** = D - Disagree SD – Strongly FD – Fairly Disagree

Please rank your company's performance measurement practices in relation to the following statements:

3.9.1 Management has assigned a corporate portfolio role to each business unit and allocates resources to support them. ***Ranked score out of 5 =***

3.9.2 Objectives for each business unit are defined in market and financial terms. ***Ranked score out of 5 =***

3.9.3 Tangible operating objectives and priorities can be defined for each business operating system in terms of customer satisfaction, flexibility and productivity. ***Ranked score out of 5 =***

- At the departmental level, customer satisfaction, flexibility and productivity are represented by specific operational criteria: quality, delivery, process time and cost ***Ranked score out of 5 =***
- ***Frequent Alignment analysis is conducted to investigate in general terms*** how well the company's actions and measures complement its strategy. ***Ranked score out of 5 =***
- How well does the measurement system supports an organizations actions and strategy. ***Ranked score out of 5 =***
- The company uses the following tools in performance management:

  Process control & instrumentation: ***Ranked score out of 5 =***

  Productivity, measurement & control: ***Ranked score out of 5 =***

  Quality assurance ***Ranked score out of 5 =***

4.0 Please highlight any performance measurement practices/ issues from your company's experience that can enrich this study