OPERATIONS STRATEGIES APPLIED FOR THE COMPETITIVENESS OF KENYAN LARGE MANUFACTURING FIRMS

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DECLARATION

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

Signed: ..... Date: 29th OCT 2001

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

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DEDICATION

To my parents John Dick Nyamwange, Teresa, Kemunto, Kemuma and Sibia, brothers and sisters, and grandmothers Nyanga'ra and Nyaboke for their love and care.

ABSTRACT

Because of the challenges brought forth by the advent of globalization and liberalization Manufacturing firms, the world over, have been forced to have a critical look at their manufacturing practices. It is through such practices that they are likely to remain competitive given the fast pace of change.

This research project sought to survey on the manufacturing strategies pursued by the large manufacturing firms in Kenya as a way of remaining afloat in the turbulent 'libero-global' environment. The survey was carried out among the large manufacturing firms in Kenya. A semi-structured questionnaire was used to collect the data necessary for the research. The questionnaire was divided into two parts. Part I collected general information on the respondent companies, their products and processes. Part two of the questionnaire gathered information on the operations strategies of the firms. The data was then analyzed by use of descriptive statistics and the hypotheses tested through non-parametric tests, namely; the Wilcoxon matched-pairs, signed ranks test and the Kruskal-Wallis test. The Wilcoxon matched-pairs signed ranks test was used to test whether there are any significant differences among the rankings of the competitive priorities. The Kruskal-Wallis test was used to compare the differences between the various data attributes of the different classes of companies.

Both null hypotheses were rejected through the non-parametric test conducted on the data collected. The findings indicate the presence of trade-offs on one side and order-winners and qualifiers on the other. Also it was found out that all firms, regardless of company characteristics compete on similar operations strategies.

The findings of this research indicate that the majority of large manufacturing firms acknowledge that operations-based strategies enhance the competitive capabilities of their firms by contributing to long-term, business performance and success. That in order to mobilize their competitiveness, firms need to emphasize high quality and consistence, low cost and hence low price, time/speed, dependability, Innovativeness, high flexibility, relationship with suppliers, quality staff and teamwork and improve their relationship with the government.

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TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 BACKGROUND

Kenya Industrial Research Development Institute defines manufacturing industry as referring to the sector of the economy that is concerned with the production of goods from raw materials using organized labor and production systems with the aid of machinery [1]. Dilworth (1992) says that manufacturing operations perform some chemical or physical processes such as weaving, sewing, welding, grinding, blending, refining or assembling to transform their raw materials into some tangible products [21]. This sector of the economy plays an important role in the developing economies like Kenya. It is seen as an important catalyst to industrial transformation [2] and hence economic change and development [3]. Manufacturing companies are expected to provide employment to the Kenyan population and support the country's "industrialization by the year 2020."

In the first 15-30 years of independence, the Kenyan government tried to develop the local industry (as was fashionable then) by shifting emphasis and resources through import substitution industrialization strategies. To this end, Hecox (1988) says, the government protected local manufacturers through a number of controls among them: quantitative import restrictions, constant control of prices, direct involvement in manufacturing like in the agricultural manufacturing, high tariff levels, and subsidies [4]. Some of the government concessions were "sometimes extraordinarily too generous" [5] which led to inefficiency of manufacturing companies which meant high operating costs which could easily be passed to the consumers [3,5,6] since they had little (if any) choice.

The manufacturing sector, like the rest of the economy, has seen a number of changes in the last 15 years which have led to increased competition between the local companies themselves and from imported goods [3,5-17]. In the late 80s, the government adopted the World Bank-International Monetary Fund aid-tied structural adjustment programs which emphasized export promotion, improved availability of imported inputs, elimination of quantitative import restrictions, constant or falling of real wages, privatization of the government's commercial activities and de-controlling of prices among other conditions [4,7].

With the signing of regional and global treaties, the government freed interest and exchange rates and abolished import and exchange controls [8,7]. For example in 1994 the Kenyan government ratified the Uruguay Round negotiations in Marakesh that saw the birth of World Trade Organization (WTO). The establishment of WTO ushered in a "new era of global economic cooperation, reflecting the desire to operate in a fairer and more open multilateral trading system ...(expected) to strengthen the world economy, lead to more trade, investment, employment and involve growth throughout the world [18]."

These liberalization policies pursued by the government have exposed the local manufacturing companies to strong competitive pressures [5,6,8-17] and which have led to loss of business by local industry [6,11,12,14,19]. Kibe [2000] says, "because of the protection previously enjoyed, Kenyan firms have been observed to lack competitiveness and produce at very high costs"[19]. Chune [1998] also notes that regulation encourages inefficiency... and makes firms fail to compete through innovation and adoption of new technologies that is now demanded by the rigor of competitive markets at home and from abroad. The other problem is that now the consumers are more informed and can choose good quality from the variety of goods in the market [20].

These economic realities have reduced many manufacturing companies' market shares and eventually their profitability. The companies have been forced to begin to adapt to change [11], which has become inevitable if they are to remain afloat in the turbulent economy.

Manufacturing companies can gain and/or retain competitiveness if they have the right operations/manufacturing strategy in place. Operations strategy is important because the operations function is responsible for a greater portion of the firm's controllable assets (up to 80%) [21,13,24]. Operations strategy is concerned with setting broad policies and plans for using the resources of the firm to best support the firm's long term competitive strategy. Let it be said at this point that the terms operations strategy and manufacturing strategy are used interchangeably in this research to mean the same thing. However, in these terms are different in situations involving service organizations. The kind of operations strategy followed will directly affect how well the organization satisfies its customers [27].

1.2 Statement of the Problem

Manufacturing strategy is seen as a key competitive weapon to success [25,26,27, etc.]. The concept of manufacturing strategy has a history of 30-plus years. Since the path breaking article by Skinner W. on "Manufacturing – missing link in a corporate strategy" that popularized the "trade-offs" theory [27] many other authors have contributed to the area of manufacturing strategy as a tool for competitiveness. These authors include Hayes and Wheelwright [29], Hill [28], Porter [30], Mintzeberg [31], Schonberger [32], among others. They all recognize the importance of linking manufacturing aspects to corporate success.

From the various authors on operations strategy, a number of priorities have been identified. These include cost, product quality and reliability, delivery speed, delivery reliability, flexibility, innovativeness. In his work, Skinner (1969) posited that organizations couldn't compete on all these strategies concurrently because some of them have inverse effects, for example, low cost may compromise quality hence the "trade-offs". Others, like Schonberger [1986,1990] disagree with Skinner [see 32,40]. Terry Hill (1994) says that these strategies can complement each other as "order winners" and "order qualifiers" [28] (see literature review).

Kenyan manufacturers, therefore, have to choose which priorities to compete on, and strive to reach Hayes and Wheelwright's stage IV of manufacturing which is the level of world-class manufacturing. At this stage:

1. They make efforts to anticipate the potential of new manufacturing practices and technologies;
2. Manufacturing is centrally involved in major marketing and engineering decisions; and
3. Long-range programmes are pursued in order to acquire capabilities in advance of needs [35,42].

A number of studies have been conducted on the challenges facing the Kenyan firm in the 'libero-global' environment and how they have responded to these challenges. Many of these studies have concentrated on corporate and marketing strategies, and specific best practices. So far none has focused on the contribution of manufacturing to competitiveness of the Kenyan firm. These studies include, but are not limited to, the following: Munyiri (2000) - Survey of the use of business process reengineering in pharmaceutical manufacturing [10], Kombo (1997) – Strategic responses by motor vehicle industry [9], Gekonge (1999) – Strategic change management [11], Owiye (1999) – Sugar industry incompetence, Kang'oro (1998) – Strategic management practices in the public sector [12]' Chune (1998) – Influence of environmental change on food manufacturing, Karemu (1993) – Strategic management practices in retailing sector, Kiruthu (1996) – Total quality management in Kenya's manufacturing sector [52].

From the foregoing it is obvious that the manufacturing operations in Kenya can be competitive if they recognize the role manufacturing can play in the total corporate strategy. This research tries to find out which strategies are currently pursued, whether they are achieving the organization objectives, on which strategies they compete in future.

Liberalization and globalization of the economy have brought with them unprecedented challenges to the Kenyan manufacturing firm (3, 5-17). One area that firms can improve on is their manufacturing operations. By having the "right" manufacturing priorities the firms will gain competitiveness and/or remain competitive [25]. The "trade-offs" theorists led by Skinner suggest prioritization of strategies [27,40,53). Others like Schonberger [32,40] and Mintzeberg [31] argue that companies are able to improve on all aspects of performance simultaneously – hence no trade-offs]. Hill (1994) argues that some of the priorities can be pursued as order winners while others are order qualifiers [28]. Kruger (1997) found out that the "majority of the so-called large South African manufacturers acknowledge that manufacturing-based strategies enhance the competitive capabilities and advantages of their firms and this contributes to long-term superior business performance and success.

But there was no evidence to support any of the schools (of trade-offs or otherwise) in Kenya. The research sought to identify the operations strategies the Kenyan manufacturers pursue and establish whether some of these are preferred to others as a way of remaining competitive given the incessantly changing business environment in a way consistent with the trade-offs theory. The research also aimed at finding out whether there is consistence in prioritization of strategies among companies or different classes of companies.

1.3 Research Objectives

The objectives of the research were:

1. To find out the operations strategies on which the manufacturing firms in Kenya compete and how they rank them.
2. To find out the reasons of their choice of specific operational strategies.

1.4 Research Questions

On what operations strategies do Kenyan manufacturing firms compete? How do the manufacturers rank the strategies?

1. What are their reasons of choice of specific manufacturing strategies?
2. Is there any significant difference between the rankings of strategies by the various classifications of companies?

1.5 Hypotheses of the Study

1. Ho: Manufacturers in Kenya do not consider all manufacturing priorities as equally enhancing competitiveness
   Ha: Manufacturers in Kenya consider all manufacturing priorities as equally enhancing competitiveness.
2. Ho: There is no difference in rankings of manufacturing priorities by the various classes of manufacturers.

Ha: There is a difference in rankings of manufacturing priorities by the various classes of manufacturers.

1.6 Importance of the Study

The findings of this study are expected to provide operations managers with insight into the contribution of various operations strategies to corporate performance and which priorities are currently pursued. The findings may help them to decide on which strategies to prioritize. The findings may be used by these managers to design better strategies, implement and monitor them for the competitiveness of their firms at the present and in future.

Contribute to literature and instruction on operations strategy in Kenya. This information is useful to scholars and researchers. The findings will contribute to knowledge in the area of operations management in Kenya. This is because most, if not all of the operations management knowledge available is on the practices in the west and little is known about local practice. The findings may also form basis for research into other areas of operations management that are related to operations strategy and competitiveness.

2.0 LITERATURE REVIEW

2.1 Manufacturing Strategy

Manufacturing strategy specifies how the firm will employ its production capabilities to support its corporate strategy (Hill 1994). The corporate strategy is based on the corporate mission, and in essence, it reflects how the firm plans to use its resources and functions (Marketing, Finance, Operations, etc) to gain competitive advantage. The firm needs to choose the right blend of operations strategies on which to compete. Manufacturing strategy is variously referred to as manufacturing priorities, manufacturing capabilities, competitive strategy variables, strategic choice attributes, strategic objectives, competitive abilities and so on [26]. The most significant corporate manufacturing decision a firm makes is its investments in manufacturing processes and infrastructure to be able to make and supply its various products to chosen markets [70]. However, companies fail (often because they do not know how) to develop a strategic perspective of manufacturing. The result is that manufacturing invests in processes and infrastructures that are not necessarily in line with the requirements of its markets.

2.2 Manufacturing Strategy Paradigm

Wickham Skinner, a well-known professor from Harvard, began a revolution in the early 1970's that resulted in the development of strategic thought for the operations function. Skinner's most important contribution was in pointing out that the cost-cutting orientation of operations managers did not mesh well with a changing consumer taste for greater product variety and higher quality in the 1970's (see Dr. Nemetz-Mills, 2000). The manufacturing strategy paradigm was developed in the 1970s and 1980s through the works of Wheelwright, Hayes, Clark, etc as they built on the works of Skinner. They emphasized on how manufacturers could use their factories capabilities as strategic competitive weapons. They argued that because a firm could not excel on all performance measures, its management must derive a focused strategy creating a "focused factory" (Porter, 1991) that does a limited set of tasks extremely well and hence the need for making "trade-offs".

From these authors and others like Hill (1994), Neely et al (1995), White (1996), Mapes & New (1997), Long & Ward (1995), Kathuria & Partoui (2000), and Aquilano et al (1998) etc a number of basic operations priorities have been identified. These include quality, cost, delivery speed/ time and reliability, flexibility, and innovativeness. Manufacturing firms all around the world now seek actively to differentiate themselves from their competitors in terms these priorities.

Quality: Chase et al (1998) argue that the level of quality in a product's design will vary with the market segment to which it is aimed. Manufacturers therefore focus on customer requirements and cost implications [25]. Gamin has suggested eight aspects of a product (or service) to consider so as to see if it satisfies one's needs. These are performance, features, reliability, conformance, durability, serviceability, aesthetics, and perceived quality [21,36]. Quality is considered to be the most important of the competitive weapons [60]. Measures of quality include the number of defects produced [56], cost of quality [56,60].

Cost: There are products that may be bought strictly on the basis of low cost. In such cases customers cannot distinguish the products of one firm from those of another. To successfully compete in the markets of such products, a firm must be a low cost producer. But this does not necessarily mean profitability and success because, in most cases, there can only be one low-cost producer, who, usually establishes the selling price in the market. Measurement of cost is considered to be the most developed of all the competitive priorities, perhaps, because of the management accounting systems that were mainly concerned with cost [21-44].

Flexibility: In manufacturing it means the availability of quality products that meet customer needs when they want them. It relates not only to the volumes and size ranges, but also to the number of different types of products that can be produced with minimum changes to the facilities set up [61-63]. The significance of uncertainty in the understanding of flexibility is used by Gerwin (1987), to link different types of uncertainty with seven distinct elements of what could be regarded as operational level flexibility. Mix flexibility is linked to uncertainty in customer requirements for product. Changeover flexibility is the ability to handle additions/deletions to the product range associated with uncertainty in product life cycles

(PLCs). Modification flexibility is the ability to handle the uncertainty in customer's requirements from standardization early in the PLC to customization later. Uncertainty in machine downtime requires re-routing flexibility, offering alternative operational sequences, while volume flexibility is the response to variation/uncertainty in the amount of customer demand. Material flexibility results from uncertainty in whether materials meet standards, and sequence flexibility is the ability to handle components in different orders in the manufacturing process, reacting to uncertainty in delivery times.

In short it entails dealing with variability in outputs, inputs, process sequence etc [58]. The other dimension of flexibility is how easily the manufacturing strategy can be modified with changes in the environment [61]. Measures of flexibility include number of components handled by equipment, set up/change-over time, and percentage of workforce cross-trained [36,37,59].

Time/speed: Although relatively new as a competitive priority time serves as both a source of competitive advantage and fundamental measure of manufacturing performance. The ability to deliver more quickly than competitors is definitely a competitive advantage. Stalk (1988) says that time is the source of competitive advantage currently exploited by world-class manufacturers [76]. This may be measured in terms of lead-time or cycle time, throughput accounting system, Hewlett-Packard return map and so on [36,37].

Innovation: This can either relate to total process or the product. It means the ability to translate needs and opportunities in the environment into satisfied needs and fulfilled opportunities. This implies improvement in quality of products or introducing new products altogether. An example is Unilever Kenya who say that they are "an innovation driven company" [64]. In terms of the process it relates improving or acquiring new (better) processes altogether. Innovation may be measured in terms of rate of introduction of new products, failure rates of prototypes, major programme milestones and so on.

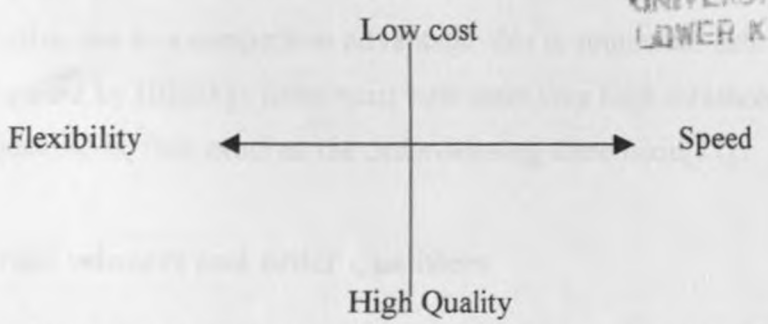
2.3 Major Approaches to Operations Strategy:

2.3.1 1960's: Emphasis on cost alone

This period was characterized by low competitiveness among the manufacturers. Their main concern was reduction of cost. They never bothered with other ways of competing. This was a period of high pent-up demand among World War II adults. This was a period of little thought given to operations strategy [71]. Low-cost strategy was characterized by high production volumes, long production runs, little customization, and there was emphasis on productivity. In most cases the products had reached maturity in their life-cycles.

2.3.2 1970's: Strategic trade offs approach

From about 1969 firms had to choose one of the priorities, that is; low cost, high quality, flexibility, or speed. Skinner's work showed the need for concentrating on a single set of tasks for a chosen competitive advantage in his work " Manufacturing – The Missing Link in Corporate Strategy" [27]



Source: Nemetz-Mills P. http:// www.cbpa.ewu.edu/~pnemetzmills. Omch2/OMOfac.html

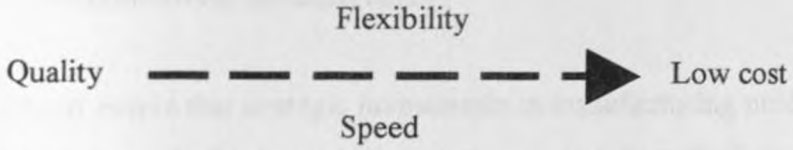
During this period competitive advantage was defined along the four dimensions: low cost, flexibility, high quality, and speedy delivery. In general, the assumption here was that there are tradeoffs associated with making choices. For example, choosing to compete on speedy delivery would result in cost increases that blocked the ability to compete on low cost.

Therefore for a company to compete it had to differentiate itself along on of these basic strategies.

This differentiation strategy was characterized low volume, unique products, often customized. In many cases the runs were shorter, production was flexible and products were of higher quality than before.

2.3.3 1980's to Present: Modern Approach

From the 1980s firms started to pursue different priorities simultaneously. They pursue low cost, high quality, flexibility, and speed. This approach has come to include a new strategy of Innovativeness [42].



Most firms today would argue that it is not enough to do well on only one dimension; firms must do well on all four (actually five)[71]. New technologies and work methods allow many firms to perform much well on all five dimensions than in the past. But firms may still choose to emphasize one as a competitive advantage; this is somewhat akin to order winners/qualifiers as put forward by Hill[28]– firms must now meet very high thresholds of performance on three of the dimensions, then excel on the order-winning dimension[71].

2.4 Order winners and order qualifiers

Order qualifiers are those characteristics that must be present for a product to be considered for purchase by a consumer. Qualifiers are those criteria that a company needs to provide in order to be considered or short-listed as a potential supplier. Examples include delivery reliability and quality conformance. They are not less important than order-winners but different. Equally a company needs to provide qualifiers as well as to support order winners better than its competitors (see28, 70).

The order winner is the final factor on which the consumer bases the purchasing decision. The term order winner is used to identify those customer requirements that enable a firm to win business. Examples include: price and delivery speed. In marketing terms, the order-winners represent a way of describing buyer behavior. In manufacturing terms, the order winning criteria represent a way of describing a market in terms of required manufacturing capabilities. When markets are viewed in these terms the business requirements against which manufacturing capabilities can be assessed become apparent.

Order winners and order qualifiers are sometimes determined by individual customers, but they can also be signaled by the whole market to an industry. Furthermore, they could change over time.

2.5 Customer-driven manufacturing

One way to ensure that strategic investments in manufacturing processes and infrastructure are made in support of a firm's marketing strategy is to follow the following process:

a) defining corporate objectives;
b) developing marketing strategies to meet these objectives;
c) assessing how different products win orders;
d) establishing the most appropriate means to manufacture;
e) providing the necessary manufacturing infrastructure [70].

This approach recognizes that manufacturing strategy has its roots in corporate strategy, as these are classical steps in corporate planning. The difference is that the last three steps are not widely recognized in practice, nor are the essential interactions between all the steps followed in formulating corporate strategy.

The development of manufacturing strategy begins by characterizing buyer behaviour and customer needs in terms of manufacturing requirements. This enables manufacturing to identify the key capabilities required by the firm's targeted customers, and to set the manufacturing task in these terms. It is manufacturing's task to provide these capabilities better than the manufacturing functions of the firm's competitors.

To help in understanding why different products are bought by customers the factors which need to be provided should be separated into order-winners and qualifiers.

Once a clear picture has been established of a market or market segment, the best way of supporting these requirements can be debated. One dimension of this debate is process choice. Manufacturing has a wide range of investment options in production processes from which to choose. The keys to choosing between these alternatives are the order winners and production volumes relating to a market or market segment. Important issues in this choice are the trade-offs between different processes compared to the current and future needs of the business.

3.0 RESEARCH METHODOLOGY

3.1 Population

The target population of study comprised all the large manufacturing firms in Kenya. The determination of the size of a firm may be based on one or more of several criteria including; number of employees in the firms, level of capital employed, sales turnover and level and type of technology used. Where number of employees is used to define size, a firm with at least 50 employees is considered large [Kibe (2000)[19], Mbeche & Yego (1996)[6], Aosa (1992)[66]]. The problem with this criterion is that with the current advances in technology and automation the number of employees may not necessarily be a good indicator. This is because a few employees can handle a large firm effectively. The other problem is that some firms may outsource some of the labour power.

However this criterion of number of employees was be used mainly because many companies, especially private companies, may not be willing to divulge information on the other parameters because of competition. This research will draw a sample from the very large manufacturing firms with over 100 employees. This approach was used by Mbeche and Yego [1996][6].

3.2 The Sample and Sampling Design

A random sample of 100 firms was picked from the Kenya Industrial Research and Development Institute (KIRDI)'s directory of manufacturing industries of 1997, which constituted the sampling frame. There are about 260 companies in the target population. Rosco (1975) proposes a rule of the thumb for determining a sample size and says that a size of 30 to 500 is appropriate for most researches [74]. The other criteria include time and cost, data analysis tools, and error rate expected. For this research non-parametric statistics was used. The analyses did not assume any form of distribution [72].

The companies were classified according to what they manufacture and proportional samples were selected from each class. The firms were numbered in each class and a proportional sample selected by use of random numbers by help of MS Excel [72].

The categories of firms in manufacturing that were used are as follows:

- Food, beverage and tobacco
- Wood and wood products, paper products, printing and publishing
- Chemicals, petroleum, rubber and plastics
- Non-metallic mineral products except petroleum
- Basic metal industries, fabricated Metal Products, machinery and equipment

3.3 Data Collection

The study relied on primary data, which was colleted by way of a semi-structured questionnaire that had both open ended and closed questions. The open-ended questions were aimed at obtaining qualitative data on the general view of operations strategy in the manufacturing sector and suggestions from the respondents. The closed questions were aimed at obtaining quantitative data for statistical analysis. The former gathered Likert type of data while the latter gathered qualitative data. The questionnaire was divided into two parts. Part I gathered information on the company profile while Part II collected information on operations strategy.

The questionnaire was first piloted among five companies so as to identify any errors of omission or commission that may not have been foreseen by the researcher. The necessary changes were made before the questionnaire was distributed. The changes included typos, ambiguous questions and suggestions to the researcher on data that could not be captured by the initial questionnaire.

A total of 70 questionnaires were distributed to large manufacturing firms in Nairobi and the surrounding areas. The drop and pick later method was used though the researcher was available to clarify some questions that were not clear to some of the respondents. 27 firms responded by completing the questionnaires representing a response rate of 39 percent. Some of

the reasons cited by those who did not accept questionnaires and those who accepted but did not complete them include company policy, absence of the appropriate officers to fill them, and lack of time. In other cases the firms selected in the sample had either gone out of business or had temporarily closed.

Data was collected from the firms in Nairobi and the surrounding areas like Thika, Limuru, Ruiru and Athi River. The reason for this is that most of the manufacturing firms in Kenya are concentrated in this region. The researcher used "drop and pick later" approach. The researcher was available to clarify any questions that were not clear to the respondents.

3.4 The Respondents

The respondents were production/operations managers, general managers, factory engineers, plant managers, brand managers, marketing managers and MDs or their assistants where they were absent for long. Generally these are the persons who are responsible for the manufacturing function in the firm.

3.5 Data Analysis

Data collected was first edited for accuracy, consistency, uniformity, completeness, and arranged to simplify coding and tabulation [see Cooper & Schindler (1998)]. The data was then coded and cross-tabulated to enable the responses to be statistically analyzed.

Descriptive statistics were used to analyze data for example percentages, proportions and frequency distribution.

Non-parametric statistics were used to test the null hypotheses. The tests used were the Wilcoxon Matched pairs signed rank test and the Kruskal-Wallis test. Non-parametric technique is used where the research satisfies at least one of the following five types of criteria as given by Prof Arsham[72]:

1. The data entering the analysis are enumerative - that is, count data representing the number of observations in each category or cross-category.
2. The data are measured and /or analyzed using a nominal scale of measurement.

3. The data are measured and /or analyzed using an ordinal scale of measurement.
4. The inference does not concern a parameter in the population distribution - as, for example, the hypothesis that a time-ordered set of observations exhibits a random pattern.
5. The probability distribution of the statistic upon which the the analysis is based is not dependent upon specific information or assumptions about the population(s) which the sample(s) are drawn, but only on general assumptions, such as a continuous and/or symmetric population distribution.

By this definition, the distinction of nonparametric is accorded either because of the level of measurement used or required for the analysis, as in types 1 through 3; the type of inference, as in type 4 or the generality of the assumptions made about the population distribution, as in type 5.

The Wilcoxon matched-pairs signed ranks test was used to test whether there are any significant differences among the rankings of the various competitive priorities. This approach was used by Kruger [26]. In this case a pair-wise treatments were conducted. The Wilcoxon test uses the signs and the ranks of the difference scores to decide whether there is a significant difference between any two priorities [Gravetter, F. J., & Wallnau, L. B. (2000) [69]]. If this hypothesis is true, any difference that does exist in the sample data must be due to chance. In this situation positive and negative difference scores would be intermixed throughout our sample. A consistent difference between two priorities would be caused by scores in one priority being either consistently ranked higher or lower than the other priority. The Wilcoxon test uses the signs and the ranks of the difference scores to decide whether there is a significant difference between the two treatments.

The Kruskal-Wallis test was used to compare the differences between the various data attributes of the different classes of companies. It is applied to data from independent groups. The Kruskal-Wallis test is used as an alternative to the single-factor analysis of variance and can be used therefore, to compare the scores from more than two treatments or groups. The scores are first ranked without regard for which group they come from; tied ranks are averaged. The ranks are then attributed to the appropriate groups and totalled. This gives a value of T, the

total of the ranks for each group, denoted as T_1, T_2, T_3, etc. In order to test the null hypothesis that there is no tendency for the ranks in any condition or group to be systematically higher or lower then the ranks in any other group or condition the T values are used in the Kruskal-Wallis formula which produces a chi-square value. It assumes that data comes from unbiased samples, Independent samples, Independence within each sample and, at least ordinal level data.

The statistical software SPSS 9.0 for Windows Version was used for these analyses.

4.0 DATA ANALYSIS AND FINDINGS

4.1 The general characteristics of the firms surveyed

The characteristics of the firms that responded are presented in the following tables 1 to 8. These include classification of manufacturing operations, ownership, market for their products, range of products, manufacturing processes, annual turnover, level of investment, and rate of new products introduction. Table 1 shows that the biggest number of respondents were from the food, beverage and tobacco industry representing 25 percent of the respondents. The miscellaneous class represents companies that did not fall in any of the given classes like the textile industry.

Table1; Classification Of Company

Classification	Frequency	Percent	Cumulative Percent
Miscellaneous	2	7.4074	7.407
Metal Industries	4	14.815	22.22
Non-metallic Mineral Products	3	11.111	33.33
Chemicals, Rubber and Plastics	6	22.222	55.56
Wood & wood Products	5	18.519	74.07
Food, Beverage & Tobacco	7	25.926	100
Total	27	100	

Source: Research data

Table2;Ownership of Company

Ownership	Frequency	Percentage	Cumulative Percent
Both local and foreign	13	48.148	48.15
Foreign	1	3.7037	51.85
Local	13	48.148	100
Total	27	100	

Source: Research data

Table 2 above presents the ownership of the respondent firms. Almost one half of the firms are locally owned while the other half is owned by both locals and foreigners. Only one of the respondent firms is wholly foreign owned.

Table 3; Market for products

Market	Frequency	Percent	Cumulative Percent
Both local & export	17	62.963	62.96
Local	10	37.037	100
Total	27	100	

Source: Research data

Table 3 above presents the markets for the products manufactured. About 63 percent of the respondent companies produce for local consumption. The rest produce both for local and export markets. Table 4 below shows that most companies (59%) among the respondents produce more than 15 different types of products. Only one company produces in the first range of 1-5 products.

Table4; Range of products

Range	Frequency	Percent	Cumulative Percent
15 and above	16	59.259	59.26
11 –15	7	25.926	85.19
6-10	3	11.111	96.3
1-5	1	3.7037	100
Total	27	100	

Source: Research data

The research shows that most of the companies that responded to the questionnaire employ both Mechanical and manual manufacturing processes. This is about 56% of the respondents. This is presented in Table 5 below. Table 6 shows that for most companies the annual turnover is in below Kshs 500 Million.

Table 5; Manufacturing Processes

	Frequency	Percentage	Cumulative Percentage
All types	10	37.037	37.04
Mechanical& Manual	15	55.556	92.59
Manual	2	7.4074	100
Total	27	100	

Source: Research data

Table 6; Annual Turnover

Kshs (Millions)	Frequency	Percentage	Cumulative Percentage
Above 1000	4	14.815	14.81
500 to 1000	7	25.926	40.74
Up to 500	16	59.259	100
Total	27	100	

Source: Research data

Table 7; Investment Level

	Frequency	Percent	Cumulative Percent
500 to 1000	8	29.63	29.63
Up to 500	19	70.37	100
	27	100	

Source: Research data

From Table 7 it is shown that most of the companies have invested up to KShs 500 million. This represents 70 percent of the respondents. Table 8 below show that most companies introduce products as need be. This is about 44 percent of the respondents. Of all the respondents only one company introduces a new product quarterly.

Table 8; Rate of New Products Introduction

	Frequency	Percent	Cumulative Percent
As need be	12	44.444	44.44
Bi-annually	4	14.815	59.26
Annually	4	14.815	74.07
Semi-Annually	6	22.222	96.3
Quarterly	1	3.7037	100
Total	27	100	

Source: Research data

4.2 .0 Operations Strategy

4.2.1 Does Operations strategy enhance competitiveness?

The respondents were asked to pick one of three choices regarding the contribution of operations strategy to competitiveness, that is as to whether or no it enhances competitiveness. The following tables show the results from the responses to questions 1 and 2 of part II of the operations strategy questionnaire. Table 9 is the frequency table of the beliefs of the respondents regarding the contribution of manufacturing strategy to the enhancement of long-term business performance and success. A total of 100% of the respondents answered yes believed that the manufacturing strategy definitely contributes to the long-term business performance and success.

Table 9; Belief

Belief	Frequency	Percent	Cumulative Percent
Yes	27	100	100

Source: Research data

Discussion of the results

Because all the respondents acknowledge the importance of manufacturing to the competitiveness of the firm, companies should give more support to the production function and let it play a pivotal role in the formulation, implementation and monitoring and evaluation of company undertakings. The production manager, for example, should not just be condemned to the factory where they only receive and respond to 'orders form above.' If Kenya firms are to attain world class manufacturing status then they should involve the manufacturing function in making decisions affecting operations of the firm [see Leong and Ward, 42].

4.2.2 Ranking of Operations Strategy

Five operations strategies were addressed by the questionnaire and respondents were given an option of indicating any other strategy not captured by the questionnaire. The respondents were asked to rank the strategies on a five point Likert scale to reflect the importance attached to each operational strategy. These ranks were the used to calculate the weighted mean score and standard deviation of responses relating to the strategies. These are used to test the hypotheses regarding the operations strategies. Detailed tables of the analyses are shown in appendices 1 and 2

4.2.3 Are priorities ranked equally?

Table 10 below shows the respondents ranking of the various operations strategies on a scale of 1 to 5, where 5 is most important and 1 is least important. Quality is ranked highest as the strategy on which to compete. It is ranked as very important by all with a mean score of 5 and standard deviation of 0. The respective mean scores for all the other strategies are shown in column 3 and their standard deviations in column 4. The last column shows the position of ranking of each strategy with respect to others. Flexibility is ranked lowest among the respondents.

Table 10; Ranking of Strategies

Priority	N	Mean score	Std. Deviation	Rank order
Quality	27	5	0	1
Consistency	5	4.8	0.447	2
Government	4	4.75	0.5	3
Staff	9	4.667	0.5	4
Suppliers	6	4.666	0.816	5
Teamwork	3	4.666	0.577	6
Cost	27	4.629	0.564	7
Time/Speed	27	4.333	0.784	8
Dependability	5	4.2	0.837	9
Innovativeness	27	4	1.177	10
Price	2	4	0	11
Flexibility	27	3.925	0.878	12

Source: Research data

Even though the table shows that quality is ranked highest among the operations strategies, this is purely a mathematical rank order, which is derived from the mean rank score of the priorities. This does not necessarily mean that quality is ranked higher than the other operations strategies.

Therefore as a way of testing the hypothesis that manufacturers in Kenya do not consider all manufacturing priorities as equally enhancing competitiveness, further statistical analysis was conducted to determine whether the differences in ranking are statistically significant. Non-parametric technique was used to this end. The Wilcoxon Matched pairs signed rank test was conducted for quality, cost, flexibility, time, and innovativeness at α=. 05 as shown in the summary in Table 11. See Appendix 1 for the full and more detailed analysis. As said earlier, this is a pair-wise test to find out whether the observed differences are real or are a result of error.

Table 11; Wilcoxon matched pairs signed ranks test a, b, c

	Cost:Qlty	Fxbty:Qlty	Time :Qlty	Invtn:Qlty	Fxbty:Cost
Z	-2.887	-3.923	-3.28582	-3.4728	-3.35
Sig. (2-tail)	0.0039*	0.0000*	0.00102*	0.0005*	0.0000*
	Time:Cost	**Invtn:Cost**	**Time:Fxbty**	**Invtn:Fxbty**	**Invtn:Time**
Z	-1.617	-2.25	-1.72965	-0.2856	-1.47
Sig. (2-tail) p	0.1059	0.0244*	0.08369	0.7752	0.143

Qlty = Quality, fxbty = Flexibility, Invtn= Innovativeness,

a= Based on positive ranks b= Based on negative ranks c= Wilcox. Sign. Ranks Test

*Results are statistically significant at α =0.05

Source: Research data

From the Wilcoxon matched pairs signed rank test above we see that the rank order is statistically significant at the level α =0.05 for the pairs marked by * while the rest are not significant. This implies that the following rank order is valid: (1) high quality, (2) low cost, and (3) time/speed, innovativeness, and flexibility which are ranked equally. This implies that there is prioritization of quality followed by low cost strategy and then the rest are pursued equally. We therefore fail to reject the null hypothesis that manufacturers in Kenya do not consider all manufacturing priorities as equally enhancing competitiveness.

Discussion of results

The test above shows that quality is ranked higher than the other priorities followed by cots. This indicates that there is a trade-off between quality and cost and the other strategies. But it is also instructive that the other priorities are also pursued equally and hence trade-offs do not necessarily exist among them. The ranking of quality is consistent to Kruger's findings [26]. These findings suggest that there are trade offs among the priorities pursued by the Kenya manufacturers given that they do not attach equal importance. They therefore support Skinner's school of trade-offs theory. Nonetheless, it is also worth to mention that this is also consistent to Hill's proposition of order winners and qualifiers. Hill argues that even though all the priorities may be pursued equally, firms may still choose to emphasize one for competitive advantage. Such a priority that is emphasized may be called the 'current order winner' while the other priorities are pursued as order qualifiers. Thus the ranking of quality

may mean that it is the current order winner. A point worth noting here is the fact that the companies that pursue some priorities as order winners do not necessarily ignore the other priorities. They still have to meet very high thresholds of performance on the other dimensions and they excel on the order-winning dimension.

4.2.3 Ranking of operations strategies by different classes of companies.

Table 12 below shows the average scores of rankings of the various operations strategies by the various classes of manufacturing companies. With the exception of quality, which is equally ranked by all classes of companies, the mean scores of the strategies are different among the companies. For example low cost is ranked as very important in the non-metal mineral products except petroleum and others classes, and so on.

Table 12; Ranking of priorities by various Classes of Companies

Classification		Rank Quality	Rank of Cost	Rank of Flexibility	Rank of Time/Speed	Rank on Innovation
Food, Bev,Tob	Mean	5.00	4.43	3.57	4.71	4.57
	N	7	7	7	7	7
	Std. Dev	.00	.79	.79	.49	.53
Wood, Pap	Mean	5.00	4.40	4.00	4.00	2.80
	N	5	5	5	5	5
	Std. Dev	.00	.55	1.00	1.00	1.64
Che, Rub, Plas	Mean	5.00	4.67	4.00	4.17	4.50
	N	6	6	6	6	6
	Std. Dev	.00	.52	1.10	.98	.55
Non Metall	Mean	5.00	5.00	4.33	4.00	3.67
Non Metall	Mean	5.00	5.00	4.33	4.00	3.67
	N	3	3	3	3	3
	N	3	3	3	3	3
	Std. Dev	.00	.00	.58	1.00	1.15
	Std. Dev	.00	.00	.58	1.00	1.15
Metal Ind.	Mean	5.00	4.75	3.75	4.50	3.75
Metal Ind.	Mean	5.00	4.75	3.75	4.50	3.75
	N	4	4	4	4	4
	N	4	4	4	4	4

	Std. Dev	.00	.50	.96	.58	1.50
Others	Mean	5.00	5.00	4.50	4.50	4.50
	N	2	2	2	2	2
	Std. Dev	.00	.00	.71	.71	.71
Total	Mean	5.00	4.63	3.93	4.33	4.00
	N	27	27	27	27	27
	Std. Dev	.00	.56	.87	.78	1.18

Source: Research data

Because the differences above are purely mathematical. Further statistical tests were necessary to find out whether they are significant. The Kruskal-Wallis test was performed to test whether there is a significant difference in the rankings of strategies by different classes of companies at α=0.05. Table 12 presents the findings in summary. For detailed analysis see Appendix 1.

Table 12; Kruskal-Wallis Test Ranking of strategies by different classes of companies

Test Statistics* a, b

	Ranking of Quality	Ranking of Cost	Ranking of Flexibility	Ranking of Time/Speed	Ranking of Innovation
Chi-Square	.000	3.118	2.356	2.873	5.617
df	4	4	4	4	4
Sig.	1.000	.538	.671	.579	.230

a Kruskal Wallis Test
b Grouping Variable: Classification Of Company
*Testing at α=0.05

Since the significance level is 0.05 the test indicates that there are no significant differences in the mean rankings of the operations strategies among the different classifications of manufacturers in Kenya.

4.2.5 Ranking based on various company characteristics

A test was conducted to find out whether there are any differences in rankings of strategies by companies depending on various characteristics namely; markets for products, the range of products manufactured, ownership of company, manufacturing processes, annual turnover, level of investment and the rates of new product introduction. Table 13 shows the summaries of Kruskal-Wallis tests on ranking of quality, cost, flexibility, time/speed, and innovativeness on these parameters. The detailed analyses are show in Appendix 2.

Table 13; Kruskall-Wallis Tests for various characteristics of companies

Table 13a; Test for Market for products

	Quality	Cost	Flexibility	Time/Speed	Innovativeness
Chi-Square	0	1.341176	0.550027	0.027357	0.017811
df	1	1	1	1	1
Asymp. Sig.	1	0.246827	0.458307	0.868629	0.89383

Table 13b;Test for Range of produts

	Quality	Cost	Flexibility	Time/Speed	Innovativeness
Chi-Square	0	2.803206	0.907274	0.918034	0.269845
df	3	3	3	3	3
Asymp. Sig.	1	0.422972	0.823672	0.821074	0.965596

Table 13c; Test for Ownership of company

	Quality	Cost	Flexibilit y	Time/Speed	Innovativeness
Chi-Square	0	0.556905	1.779817	3.37063	0.638371
df	2	2	2	2	2
Asymp. Sig.	1	0.756954	0.410693	0.185386	0.726741

Table 13d; Test for Manufacturing processes

	Quality	Cost	Flexibility	Time/Speed	Innovativeness

Chi-Square	0	0.277583	0.202752	2.984529	4.675006
df	2	2	2	2	2
Asymp. Sig.	1	0.87041	0.903593	0.224863	0.096568

Table 13e; Test for Annual Turnover

	Quality	Cost	Flexibility	Time/Speed	Innovativeness
Chi-Square	0	1.679146	2.86771	1.30041	0.106699
df	2	2	2	2	2
Asymp. Sig.	1	0.431895	0.238388	0.521939	0.948049

Table 13f; Test for Level of Investment

	Quality	Cost	Flexibility	Time/Speed	Innovativeness
Chi-Square	0	1.746191	1.660309	0.531195	0.287655
df	1	1	1	1	1
Asymp. Sig.	1	0.186356	0.197562	0.466105	0.591727

Table 13g; New products Introduction

	Quality	Cost	Flexibility	Time/Speed	Innovativeness
Chi-Square	0	3.368055	3.043478	3.711111	3.691935
df	3	3	3	3	3
Asymp. Sig.	1	0.338282	0.38497	0.294396	0.296709

From the tests in 13 it is evident that there is no difference in the rankings of operations strategies among companies with different characteristics. They all pursue the same strategies.

Discussion Of Results

This results show that Kenya manufacturers, regardless of their specific company characteristics - like what they manufacture, the market for their products, level of investment, range of products, ownership of company and so on – pursue similar operations strategies. They attach equal importance to the operations priorities. The implication here is that, regardless of the company characteristics, in order for companies to gain and maintain competitiveness, they, of necessity, should pursue the right operations strategies. This is especially so now that they are no longer protected by the government and there are many players in the field - local and foreign which gives consumers a wide range of selection.

4.3 Reasons for Choosing Operations Strategies

The respondents were asked, by way of open-ended questions, to give the reasons why they choose the various operations strategies. These reasons are presented below and consideration is not given to the number of times a given reason was given.

Quality

1. Survival of the businesses.
2. To meet both national and international standards.
3. To reduce liability from defective products.
4. To increase sales through customer satisfaction.
5. Company culture and pride and the believe that "customer is king".
6. Loyalty of customers through building of customer confidence.
7. Reduce time and cost that arises from reworks
8. Quality is a way of advertising because satisfied customers will recommend the products to others.
9. To attract and retain customers.

Cost

1. Competitiveness
2. For profit reasons.
3. Sustainability
4. Growth and penetration.
5. Pricing and making goods affordable to the customer.
6. Some products are bought because of their high price especially those bought for prestige.

Flexibility

1. To be able to meet special orders and demand
2. To reduce cost of operations

3. To be able to make a wide range of products
4. To make sure quality is not compromised in any way.

Innovativeness

1. In order to be able to survive
2. To meet changing customer needs, and tastes and to keep pace with market trends
3. To stay ahead of competitors who may try to copy the company's products
4. Anticipation of emerging needs
5. For purposes of growth
6. To get better and efficient ways of doing things.
7. Market expansion

Time /Speed

1. To maintain reliability
2. Efficiency determines cost and effectiveness
3. To retain customer loyalty and attract new customers

4.4 The problems encountered by the manufacturers in designing, implementing and evaluating operations strategy

The respondents were asked to give some of the problems they encounter in their pursuit of strategy. They gave the following problems.

Quality

1. The quality of raw materials sometimes fails to meet their required standards. But this is countered by sometimes procuring materials from outside the country.
2. Quality is costly to attain and maintain
3. Lack of skilled human resources hinders some companies' pursuit of quality.
4. Systems have to be set properly to have the right quality. But if senior management can not support them it becomes impossible to attain quality.

Cost

1. Constant price fluctuations makes it hard to control costs
2. Quality is very costly to maintain.
3. Human resource is very expensive especially unionized employees
4. There are too many clauses in the tax laws of the country, which makes some of the companies, want to quit.
5. The poor infrastructure in the country makes transportation of both raw materials and finished products to be too expensive
6. Dishonest employees who steal products and materials mean that the companies have to go into extra costs to reduce the pilferage.
7. Fluctuations in exchange and interest rates makes it expensive to buy from outside countries for the companies that import materials and also makes cost of funds to rise.
8. The cost of power, petroleum products and other fuel materials makes the cost to be too high.
9. Corruption forces some of the companies to bribe government officials so as to get protection or even licenses to operate or register new products.

Flexibility

1. Some of the companies have very small capacity installed and therefore the only flexibility they have is to work their employees overtime and during the weekends.
2. To attain and maintain flexibility is very expensive.
3. Some customer specifications that were not anticipated may be too hard to meet.
4. Some customers give very short notices.

Innovativeness

1. Research and development is very expensive
2. Sometimes it is not easy to anticipate the direction of customer expectations
3. Launching new products is an expensive and risky undertaking.
4. Bureaucracies in new product registering sometimes leads to competitors becoming able to copy the products before they reach the market.

Time / Speed

1. Approval and availability of materials to purchase takes time especially where the decisions are not made by the operations people.
2. Bureaucracies in government lead to delays for example clearing materials at the entry points into the country takes too long.
3. Poor infrastructure leads to delays.

4.5 Strengths of the companies

Companies were asked to give what they consider to be their strengths in the various operations strategies and they gave the following as their strengths.

Quality

1. Quality personnel with the requisite skills and experience. They also take them for trainings, seminars and so on.
2. Ability to anticipate customer needs
3. They do not accept low quality materials regardless of whether they are for packaging or for production.
4. Ability to import quality materials in place of poor quality local materials.
5. State of the art equipment and productive maintenance practices
6. ISO 9000 series certification is also considered as a strength
7. Provision of guarantee for long periods
8. Ability to work as teams

Cost

1. Ability to produce a big range of products for different prices.
2. Partnership with suppliers
3. Use of local inputs reduces the costs of procurement
4. Efficiency in production and procurement practices.
5. Use of the state of the art machinery and technologies

Flexibility

1. Ability to meet varied demands with little disturbance because they have big capacity.
2. Ability to outsource finished products from other companies outside the country when demand can not be met by available capacity.
3. Ability to reduce prices to such a level as to compete with the other market players.

Innovativeness

1. Ability to attract good quality researchers.
2. Setting aside enough money for the research budget.
3. Motivation and reward of researchers for work well done.
4. Agility and readiness to improve through enculturation of change into the company

Time /Speed

1. Efficient distribution networks throughout the country.
2. Big capacity that helps in fast response to customer demands

4.5 Evaluation of strategy

The respondents were asked to state some of the indicators they use to measure their performance in the various operations strategies. They gave the following as the measures.

Quality

1. Number of spoils and rejects
2. Number of customer complaints
3. Cost of quality in general
4. Percentage of spoils to total production
5. Ratio of spoils to good production
6. Number of reworks
7. Scrap rate
8. Warranty rate

9. Sales volumes
10. Repeat Purchases

Cost

1. Profitability
2. Variance analysis
3. Cost of wastage
4. Cost of reworks
5. Cost of production per unit
6. Total Cost
7. Inter-company comparisons
8. Cost as percentage of revenue
9. Productivity per man-hour
10. Machine hour used.

Flexibility

1. Set-up time
2. Overtime hours
3. Range of products per process

Innovativeness

1. Number of product line extensions over time
2. Number of new products over time
3. Cost of developing new products
4. Response of customers to new products
5. Cost of research

Time/Speed

1. Lead time
2. Productivity per man-hour

4.6 Who is involved in the processes of strategy?

Formulation

The following were listed as the people responsible for strategy formulation

1. Top management
2. Middle level management
3. Supervisors and designers
4. Quality controllers
5. Production manager /Operations manager / factory manager /plant manager / factory engineers
6. Sales manager
7. Operational staff

Implementation

1. Supervisors
2. Production manager /Operations manager / factory manager /plant manager / factory engineers
3. All departmental heads

Evaluation

1. Top level Management
2. Departmental heads
3. Finance
4. Quality Assurance
5. Customers
6. Board of directors

4.7 Other Findings

Some of the respondents said that a company can have very good strategies and statements of intent but what matters is how well these are managed. One MD said that the best way to make strategies benefit the firms is by not only having the best employees but also by good reward systems, and feedback and continuous monitoring. Others suggested that policies, like quality policy must be made clear to everybody. Good policies must be documented both for the current and future employees. Involvement of everybody and goodwill of the senior management is one of the surest ways of ensuring things work well in the operations of the company.

Chapter 5: Summary and Recommendations

5.1 Conclusion

This was an exploratory study that had the objective of finding out the operations strategies on which the manufacturing firms in Kenya compete and how they rank them. It sought to find out whether the rankings are significantly different not only among the strategies themselves but also between the various classifications of manufacturing companies. This was achieved through testing of hypotheses. The other objective was to find the reasons of choosing and including the various strategies in the manufacturing operations of firms. The study collected data on the strengths of the companies and the problems they face in their pursuit of strategy. Data was also gathered on the indicators used by the companies to measure the progress and or results of the various operations strategies.

The study found out that most Kenyans manufacturers believe that the manufacturing strategy of their company enhances long-term business performance and success. Further the study found out that the operations strategies on which the companies compete, in their order of rank, are: (1) high quality, (2) low cost, and (3) time/speed, innovativeness, and flexibility which are ranked equally. The other factors on which these companies compete include quality human skills and teamwork, dependability, good relationships with suppliers and government. Note also that in the analysis some respondents gave price as a separate strategy form cost, but strictly speaking price is pursued under cost. The same applies to consistency which, according to Garvin, falls under the eight dimensions of quality [see 21,36]

From statistical analysis it was found that the ranking of strategies was significantly different between quality and cost and also between these two and the other strategies. This means that we fail to reject hypothesis one that manufacturers in Kenya do not consider all manufacturing priorities as equally enhancing competitiveness. This means that there is prioritization, which implies the presence of trade-offs between the strategies. This is consistent with the trade-offs school that is advocated by Skinner [27,53] and Porter's focused factory [30].

These results also support Hill's proposition of order-winners and order qualifiers. Hill says that a firm may emphasize on one priority known as the 'current order-winner' and pursue the other priorities as order qualifiers without necessarily neglecting them. Hence the results could imply that quality is currently pursued as the order winner and the rest as order qualifiers.

The research also found that different classes of manufacturers pursue similar strategies. This means that we fail to reject the null hypothesis that there is no difference in rankings of manufacturing priorities by the various classes of manufacturers. Further analysis was done on the various characteristics of companies and ranking of strategy and similar results were got. There are no differences in the ranking of strategies by companies regardless of who owns them, who buys there products, the level of investment, turnover, number of different kinds of products, rate of new products introduction and the types of manufacturing processes.

From these results Kenyan manufacturers, regardless of class of manufacturing, market of products, level of investment, range of products, rate of new product introduction, annual turnover, manufacturing processes, or ownership, should focus on the following priorities (in order of priority): (1) high quality, (2) low cost, and (3) time/speed, innovativeness, and flexibility which are ranked equally.

It is also worth noting that the success of strategy is not just good strategies and statements of intent but how well these are implemented and managed. One MD said that the best way to make strategies benefit the firms is by not only having the best employees but also by good reward systems, and feedback and continuous monitoring. Others suggested that policies, like quality policy must be made clear to everybody. Good policies must be documented both for the current and future employees. Involvement of everybody and goodwill of the senior management is one of the surest ways of ensuring things work well in the operations of the company.

5.2Recommendations

From the results of the study we realize that operations strategy plays an important role in the competitiveness of the manufacturing firms. This is because of the importance attached to the various aspects of strategy. It is therefore important that manufacturers accord the manufacturing function the necessary support so as to enhance business success. Manufacturing companies should give more support to the production function and let it play a pivotal role in the formulation, implementation and monitoring and evaluation of company undertakings. The production manager, for example, should not just be condemned to the factory where they only receive and respond to 'orders form above.' If Kenya firms are to attain world class manufacturing status then they should involve the manufacturing function in making decisions affecting operations of the firm. Leong and ward suggest that such companies need to have manufacturing involved in planning, and performance measurement and it should be proactive(should not just wait for orders). They should participate in programmes of improvement, setting up of a portfolio of manufacturing capabilities (or priorities) and develop the best actions to attain competence.

For the firms to be successful they need to focus on the following priorities (in order of priority): (1) high quality; (2) low cost; and (3) time/speed, innovativeness, and flexibility which are ranked equally. They need to have supportive systems and train their employees on the various aspects of strategy. For example they can make quality everybody's responsibility and not just for the people in the factory. Management should employ qualified personnel as the best way to attainment of high quality. The employees should be supported to this end by providing them with good quality equipment. The other way to ensure quality is through maintenance of high standards of raw and packaging materials.

Manufacturers should maintain good relations with their suppliers because this is one of the ways of supporting not only high quality raw materials but also lower costs of procurement and speed and reliability.

The success of strategy is not just good strategies and statements of intent but how well these are implemented and managed. One to make strategies benefit the firms is by through good feedback and continuous monitoring systems and reward systems. Quality policy must be made clear to everybody. Good policies must be documented both for the current and future employees. Involvement of everybody and goodwill of the senior management is one of the surest ways of ensuring things work well in the operations of the company.

5.3 Limitations of the Study

While interpreting the findings of this study one should bear in mind a number of limitations. First and foremost these findings are based on the response from 27 firms. This is because many manufacturing firms were found to be unwilling to participate in the study because of company policy, lack of time, and absence of the right persons to fill the questionnaires among other reasons. In as much as there are statistical tools for small samples the sample of 27 would reduce the robustness of the findings. Secondly, the study suffers from the general problems associated with questionnaire-based research like misunderstanding of questions. However, efforts to address this problem were undertaken in this study.

5.3 Suggestions for further research

This was an exploratory survey study that sought to establish the operations strategies of manufacturing firms in Kenya. Further research could be done on other issues related to operations strategy to improve on these findings. These could include the following areas

1. Detailed studies into specific practices on each of the operations strategies like flexibility and systems design
2. Detailed studies on measuring the performance and evaluation of manufacturing strategies by successful companies.
3. A research to find out which of the strategies are order winners and which ones are order qualifiers in the manufacturing industry.
4. A replication of this study to other sectors of the economy like the service industry.

5. A study into the relationship between operations strategy and other areas of the business like finance, human resource management and marketing and how the relationships may enhance competitiveness.

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Appendix 1

Frequency Table

Ownership of Company

	Frequency	Percent	Cumm %
Local & Foreign	13	48.1481	48.1481
Foreign	1	3.7037	51.8519
Local	13	48.1481	100
Total	27	100	

Market for products

	Frequency	Percent	Cumm %
Local&Export	17	62.9629	62.9629
Local	10	37.0370	100
Total	27	100	

Belief

	Frequency	Percent	Cumm %
Yes	27	100	100

Classification Of Company

	Frequency	Percent	Cumm %
5	4	14.8148	22.2222
4	3	11.1111	33.3333
3	6	22.2222	55.5556
2	5	18.5185	74.0741
1	7	25.9259	100
Total	27	100	

Range of products

	Frequency	Percent	Cumm %
3	7	25.9259	85.1852
2	3	11.1111	96.2963
1	1	3.7037	100
Total	27	100	

Manufacturing Processes

	Frequency	Percent	Cumm %
4	15	55.5556	92.5926
2	2	7.4074	100
Total	27	100	

Annual Turnover

	Frequency	Percent	Cumm %
2	7	25.9259	40.7407
1	16	59.2593	100
	27	100	

Investment Level

	Frequency	Percent	Cumm %
1	19	70.3704	100
Total	27	100	

Rate of new products Introduction

	Frequency	Percent	Cumm %
5	4	14.8148	59.2593
4	4	14.8148	74.0741
3	6	22.2222	96.2963
2	1	3.7037	100
Total	27	100	

Ranking Quality

	Frequency	Percent	Cumm %
5	27	100	100

Cost

	Frequency	Percent	Cumm %
4	8	29.6296	96.2963
3	1	3.7037	100
Total	27	100	

Flexibility

	Frequency	Percent	Cumm %
4	10	37.0370	66.6667
3	8	29.6296	96.2963
2	1	3.7037	100
Total	27	100	

Time/Speed

	Frequency	Percent	Cumm %
4	8	29.6296	81.4815
3	5	18.5185	100
Total	27	100	

Innovativeness

	Frequency	Percent	Cumm %
4	8	29.6296	74.0741
3	3	11.1111	85.1852
2	3	11.1111	96.2963
1	1	3.7037	100
Total	27	100	

Non-Parametric Tests

Descriptive Statistics

Priority	N	Mean	Std. Deviation	Minimum	Maximum
Quality	27	5	0	5	5
Cost	27	4.6296	0.5649	3	5
Flexibility	27	3.9259	0.8738	2	5
Time/Speed	27	4.3333	0.7845	3	5
Innovativeness	27	4	1.1767	1	5
Staff	9	4.6667	0.5000	4	5
Suppliers	6	4.6667	0.8165	3	5
Government	4	4.75	0.5000	4	5
Price	2	4	0	4	4
Consistency	5	4.8	0.4472	4	5
Teamwork	3	4.6667	0.5774	4	5
Dependability	5	4.2	0.8367	3	5

Kruskal-Wallis Test

Ranks

	Classification Of Comp	N	Mean Rank
Quality	1	7	13
	2	5	13
	3	6	13
	4	3	13
	5	4	13
	Total	25	
Cost	1	7	11.7143
	2	5	10.3000

	3	6	13.5
	4	3	17.5
	5	4	14.5
	Total	25	

	Class Of Company	N	Mean Rank
Flexibility	1	7	10.2857
	2	5	13.8000
	3	6	14.5
	4	3	16.6667
	5	4	11.75
	Total	25	
Time/Speed	1	7	16.1429
	2	5	10.6000
	3	6	12
	4	3	10.3333
	5	4	14
	Total	25	
Innovativeness	1	7	16.1429
	2	5	7.6000
	3	6	15.5
	4	3	10.6667
	5	4	12.25
	Total	25	
Staff	1	1	6
	2	3	4.6667
	3	2	6
	4	1	2
	5	1	2
	Total	8	
Suppliers	1	2	2.5
	3	2	4
	5	2	4
	Total	6	
Government	1	1	1
	3	2	3
	5	1	3
	Total	4	
Price, a	3	2	1.5
	Total	2	
Consistency	1	2	3
	2	1	3
	3	1	1
	Total	4	
Teamwork	1	1	2.5
	2	1	1

	3	1	2.5
	Total	3	
Dependability	1	1	2.5
	3	3	2.6667
	4	1	4.5
	Total	5	

a=There is only one non-empty group. Kruskal-Wallis Test cannot be performed.

Test Statistics a,b

	Quality	Cost	Flexibility	Time/Speed	Innovativeness
Chi-Square	0	3.1182	2.3560	2.8728	5.6170
df	4	4	4	4	4
Asymp. Sig.	1	0.5382	0.6706	0.5793	0.2296

	Suppliers	Government	Consistency	Team	Dependability	Staff
Chi-Square	2.0000	3	3	2	1.2590	4.5110
df	2	2	2	2	2	4
Asymp. Sig.	0.368	0.2231	0.2231	0.3679	0.5328	0.3410

a=Kruskal Wallis Test
Variable: Classification Of Company

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Quality	27	5	0	5	5
Cost	27	4.6296	0.5649	3	5
Flexibility	27	3.9259	0.8738	2	5
Time/Speed	27	4.3333	0.7845	3	5
Innovativeness	27	4.0000	1.1767	1	5

Wilcoxon Matched Pairs Signed Rank Test

Ranks

		N	Mean Rank	Sum of Ranks
Cost - Quality	Negative Ranks	9	5	45
	Positive Ranks	0	0	0
	Ties	18		
	Total	27		
Flexibility - Quality	Negative Ranks	19	10	190
	Positive Ranks	0	0	0
	Ties	8		
	Total	27		
Time/Speed - Quality	Negative Ranks	13	7	91
	Positive Ranks	0	0	0
	Ties	14		
	Total	27		
Innovation - Quality	Negative Ranks	15	8	120
	Positive Ranks	0	0	0
	Ties	12		
	Total	27		
Flexibility - Cost	Negative Ranks	15	8.633	129.5
	Positive Ranks	1	6.5	6.5
	Ties	11		
	Total	27		

Time/Speed - Cost	Negative Ranks	13	9.192	119.5
	Positive Ranks	5	10.300	51.5
	Ties	9		
	Total	27		
Innovativeness - Cost	Negative Ranks	13	10.462	136
	Positive Ranks	5	7	35
	Ties	9		
	Total	27		
Time/Speed - Flexibili	Negative Ranks	6	6.833	41
	Positive Ranks	11	10.182	112
	Ties	10		
	Total	27		
Innovativeness - Flexi	Negative Ranks	10	10.75	107.5
	Positive Ranks	11	11.227	123.5
	Ties	6		
	Total	27		
Innovativeness - Time	Negative Ranks	11	7.727	85
	Positive Ranks	4	8.75	35
	Ties	12		
	Total	27		

Test Statistics

	Co:Quality	Flex:Quality	Tim:Quality	Inno:Quality	Flex:Cost
Z	-2.8868	-3.9232	-3.2858	-3.4728	-3.3464
Asymp. Sig. (2-tailed)	0.0039	0.0001	0.0010	0.0005	0.0008

	Tim:Cost	Inno:Cost	Tim:Flexibility	Innov:Flex	Inno:Tim
Z	-1.6170	-2.2503	-1.7297	-0.2856	-1.4665
Asymp. Sig. (2-tailed)	0.1059	0.0244	0.0837	0.7752	0.1425

a= Based on positive ranks.
b= Based on negative ranks.
c= Wilcoxon Signed Ranks Test

Sign Test

Frequencies

		N
Cost - Quality	Negative Differences	9
	Positive Differences	0
	Ties	18
	Total	27
Flexibility - Qualit	Negative Differences	19
	Positive Differences	0
	Ties	8
	Total	27
Time/Speed - Qua	Negative Differences	13
	Positive Differences	0
	Ties	14
	Total	27
Innovativeness - I	Negative Differences	15
	Positive Differences	0
	Ties	12
	Total	27
Flexibility - Cost	Negative Differences	15

	Positive Differences	1
	Ties	11
	Total	27
Time - Cost	Negative Differences	13
	Positive Differences	5
	Ties	9
	Total	27
Innovation- Cost	Negative Differences	13
	Positive Differences	5
	Ties	9
	Total	27
Time- Flexibility	Negative Differences	6
	Positive Differences	11
	Ties	10
	Total	27
Innovation-Flexibi	Negative Differences	10
	Positive Differences	11
	Ties	6
	Total	27
Innovation-Time	Negative Differences	11
	Positive Differences	4
	Ties	12
	Total	27

Test Statistics

	Cos:Quality	Flex:Quality	Tim:Quality	Inno:Quality	Fle:Cost
Exact Sig. (2-taile	0.0039	0.0000	0.0002	0.0001	0.0005

	Tim:Cost	Inno:Cost	Tim:Fle	Inn:Flexibility	Inn:Time
Exact Sig. (2-taile	0.0963	0.0963	0.3323	1	0.1185

a Binomial distribution used.

b Sign Test

Firms * Ranking Quality

Crosstab

		Ranking Quali	Total
		5	
Total Firms	Count	27	27
	% within Fir	100	100
	% within Ra	100	100
	% of Total	100	100

Chi-Square Tests

	Value
Pearson Chi-Square	a
N of Valid Cases	27

a No statistics are computed because Ranking Quality is a constant.

Firms * Ranking Quality

Symmetric Measures

		Value
Interval by Interval Pea	a	
N of Valid Cases		27

a= No statistics are computed because Ranking Quality is a constant.

Firms * Cost

Crosstab

		Cost	
		3	4
Total Firms	Count	1	8
	% within Fir	3.7037	29.6296
	% within Co	100	100
	% of Total	3.7037	29.6296

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	54a	52	0.3979
Likelihood Ratio	40.6507	52	0.8727
Linear-by-Linear Assoc	0.6199	1	0.4311
N of Valid Cases	27		

a= 81 cells (100.0%) have expected count less than 5. The minimum expected count is .04.

Symmetric Measures

	Value	Asymp. Std	Approx. T	Approx. Sig.
Interval by Interval Pea	-0.1544	0.1572	-0.7814	0.4419
Ordinal by Ordinal Spe	-0.1545	0.1813	-0.7820	0.4416
N of Valid Cases	27			

a Not assuming the null hypothesis.

b Using the asymptotic standard error assuming the null hypothesis.

c Based on normal approximation.

Firms * Flexibility

Crosstab

		Flexibility				Total
		2	3	4	5	
Total Firms	Count	1	8	10	8	27
	% within Firms	3.7037	29.6296	37.0370	29.6296	100
	% within Flexibility	100	100	100	100	100
	% of Total	3.7037	29.6296	37.0370	29.6296	100

Chi-Square Tests

	Value		Asymp. Sig. (2-sided)
Pearson Chi-Square	81	78	0.3857
Likelihood Ratio	65.3814	78	0.8453
Linear-by-Linear Assoc	1.4104	1	0.2350
N of Valid Cases	27		

a 108 cells (100.0%) have expected count less than 5. The minimum expected count is .04.

Symmetric Measures

	Value	Asymp. Std. E	Approx. T	Approx. Sig.
Interval by Interval Pearson's R	0.2329	0.1941	1.1975	0.2423
Ordinal by Ordinal Spearman Correlation	0.2058	0.1934	1.0515	0.3031
N of Valid Cases	27			

a Not assuming the null hypothesis.
b=Using the asymptotic standard error assuming the null hypothesis.
c=Based on normal approximation.

Firms * Time/Speed

Crosstab

		Time/Speed			Total
		3	4	5	
Total Firms	Count	5	8	14	27
	% within Fir	18.5185	29.6296	51.8519	100
	% within Tin	100	100	100	100
	% of Total	18.5185	29.6296	51.8519	100

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	54	52	0.3979
Likelihood Ratio	54.7161	52	0.3718
Linear-by-Linear Assoc	0.6706	1	0.4128
N of Valid Cases	27		

a = 81 cells (100.0%) h .

Symmetric Measures

		Value	symp. Std. Err	Approx. T	Approx. Sig.
Interval by Interval	Pearson's R	0.1606	0.1791	0.8136	0.4236
Ordinal by Ordinal	Spearman Correlation	0.1435	0.1883	0.7248	0.4753
N of Valid Cases		27			

a =Not assuming the null hypothesis
b=Using the asymptotic standard error assuming the null hypothesis.
c=Based on normal approximation.

Firms * Innovativeness

Crosstab

	Innovativeness					Total
	1	2	3	4	5	
Count	1	3	3	8	12	27
% within Firms	3.7037	11.1111	11.1111	29.6296	44.4444	100
% within Innovativeness	100	100	100	100	100	100
% of Total	3.7037	11.1111	11.1111	29.6296	44.4444	100

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	108	104	0.3745
Likelihood Ratio	71.8830	104	0.9931
Linear-by-Linear Assoc	0.6036	1	0.4372
N of Valid Cases	27		

a =135 cells (100.0%) have expected count less than 5. The minimum expected count is .04.

Symmetric Measures

		Value	Asymp. Std. E	Approx. T	Approx. Sig.
Interval by Interval	Pearson's R	0.1524	0.1766	0.7708	0.4480
Ordinal by Ordinal	Spearman Correlatic	0.0931	0.1903	0.4678	0.6440
N of Valid Cases		27			

a=Not assuming the null hypothesis.
b=Using the asymptotic standard error assuming the null hypothesis
c=Based on normal approximation

Firms * Staff

Crosstab

		Staff		Total
		4	5	
Total Firms	Count	3	6	9
	% within Firı	33.3333	66.6667	100
	% within Sta	100	100	100
	% of Total	33.3333	66.6667	100

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9	8	0.3423
Likelihood Ratio	11.4573	8	0.1771
Linear-by-Linear Assoc	0.0333	1	0.8551
N of Valid Cases	9		

a=18 cells (100.0%) have expected count less than 5. The minimum expected count is .33.

Symmetric Measures

		Value	Asymp. Std. E	Approx. T	Approx. Sig.
Interval by Interval	Pearson's R	0.0645	0.2895	0.1711	0.8690
Ordinal by Ordinal	Spearman Correlatio	0.0913	0.3164	0.2425	0.8153
N of Valid Cases		9			

a=Not assuming the null hypothesis.
b=Using the asymptotic standard error assuming the null hypothesis.
c=Based on normal approximation.

Firms * Relationship with Suppliers

Crosstab

		Relationship with Suppliers		Total
		3	5	
Total Firms	Count	1	5	6
	% within Firı	16.6667	83.3333	100
	% within Re	100	100	100
	% of Total	16.6667	83.3333	100

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6	5	0.3062
Likelihood Ratio	5.4067	5	0.3683
Linear-by-Linear Assoc	2.2164	1	0.1366
N of Valid Cases	6		

a 12 cells (100.0%) have expected count less than 5. The minimum expected count is .17.

Symmetric Measures

		Value	Asymp. Std. E	Approx. T	Approx. Sig.
Interval by Interval	Pearson's R	-0.6658	0.1964	-1.7846	0.1489
Ordinal by Ordinal	Spearman Correlatio	-0.6547	0.2390	-1.7321	0.1583
N of Valid Cases		6			

a=Not assuming the null hypothesis.
b=Using the asymptotic standard error assuming the null hypothesis.
c=Based on normal approximation.

Firms * Relationship With Government

Crosstab

		Relationship With Governm		Total
		4	5	
Total Firms	Count	1	3	4
	% within Firı	25	75	100

	% within Re	100	100	100
	% of Total	25	75	100

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4	3	0.2615
Likelihood Ratio	4.4987	3	0.2124
Linear-by-Linear Assoc	0.0047	1	0.9451
N of Valid Cases	4		

a=8 cells (100.0%) have expected count less than 5. The minimum expected count is .25.

Symmetric Measures

		Value	Asymp. Std. E	Approx. T	Approx. Sig.
Interval by Interval	Pearson's R	-0.0397	0.2835	-0.0563	0.9603
Ordinal by Ordinal	Spearman Correlatio	0.2582	0.4282	0.3780	0.7418
N of Valid Cases		4			

a=Not assuming the null hypothesis.

b=Using the asymptotic standard error assuming the null hypothesis.

c=Based on normal approximation

Firms * Price

Crosstab

	Price	Total
	4	
Count	2	2
% within Firms	100	100
% within Price	100	100
% of Total	100	100

Chi-Square Tests

	Value
Pearson Chi-Square	
N of Valid Cases	2

a No statistics are computed because Price is a constant.

Symmetric Measures

		Value
Interval by Interval	Pearson's R	.
N of Valid Cases		2

a No statistics are computed because Price is a constant.

Firms * Consistency

Crosstab

	Consistency		Total
	4	5	
Count	1	4	5
% within Firms	20	80	100
% within Consistency	100	100	100
% of Total	20	80	100

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5	4	0.2873
Likelihood Ratio	5.0040	4	0.2869
Linear-by-Linear Assoc	0.2586	1	0.6111
N of Valid Cases	5		

a=10 cells (100.0%) have expected count less than 5. The minimum expected count is .20

Symmetric Measures

		Value	Asymp. Std. E	Approx. T	Approx. Sig.
Interval by Interval	Pearson's R	-0.2543	0.2301	-0.4554	0.6798
Ordinal by Ordinal	Spearman Correlatio	-0.3536	0.3283	-0.6547	0.5594

N of Valid Cases	5

a=Not assuming the null hypothesis.
b=Using the asymptotic standard error assuming the null hypothesis.
c=Based on normal approximation.

Firms * Teamwork
Crosstab

	Teamwork		Total
	4	5	
Count	1	2	3
% within Firms	33.3333	66.6667	100
% within Teamwork	100	100	100
% of Total	33.3333	66.6667	100

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3	2	0.2231
Likelihood Ratio	3.8191	2	0.1481
Linear-by-Linear Assoc	0.2143	1	0.6434
N of Valid Cases	3		

a=6 cells (100.0%) have expected count less than 5. The minimum expected count is .33.

Symmetric Measures

		Value	Asymp. Std. E	Approx. T	Approx. Sig.
Interval by Interval	Pearson's R	0.3273	0.3645	0.3464	0.7877
Ordinal by Ordinal	Spearman Correlatio	0	0.6124	0	1
N of Valid Cases		3			

a=Not assuming the null hypothesis.
b=Using the asymptotic standard error assuming the null hypothesis.
c=Based on normal approximation.

Firms * dependability
Crosstab

	dependability			Total
	3	4	5	
Count	1	2	2	5
% within Firms	20	40	40	100
% within dependability	100	100	100	100
% of Total	20	40	40	100

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10	8	0.2650
Likelihood Ratio	10.5492	8	0.2286
Linear-by-Linear Assoc	2.7114	1	0.0996
N of Valid Cases	5		

a

Symmetric Measures

		Value	Asymp. Std. E	Approx. T	Approx. Sig.
Interval by Interval	Pearson's R	0.8233	0.0924	2.5124	0.0868
Ordinal by Ordinal	Spearman Correlatio	0.7906	0.1941	2.2361	0.1114
N of Valid Cases		5			

a= Not assuming the null hypothesis.
b= Using the asymptotic standard error assuming the null hypothesis.
c= Based on normal approximation.

Comparison of Ranking Priorities By Classification of Companies

Food, beverage And Tobacco

Quality	Cost	Flexibility	Time/Speed	Innovativene	Staff

Mean	5	4.4286	3.5714	4.7143	4.5714	5
N	7	7	7	7	7	1
Std. Deviation	0	0.7868	0.7868	0.4880	0.5345	.
% of Total N	25.9259	25.9259	25.9259	25.9259	25.9259	11.1111
% of Total Sum	25.9259	24.8	23.5849	28.2051	29.6296	11.9048

	Suppliers	Government	Price	Consistency	Teamwork	Depend
Mean	4	4		5	5	4
N	2	1		2	1	1
Std. Deviation	1.4142	.		0	.	.
% of Total N	33.3333	25		40	33.3333	20
% of Total Sum	28.5714	21.0526		41.6667	35.7143	19.0476

Wood, Wood Products, Paper Products, Printing and Publishing

	Quality	Cost	Flexibility	Time/Speed	nnovativenes	Staff
Mean	5	4.4	4	4	2.8	4.6667
N	5	5	5	5	5	3
Std. Deviation	0	0.5477	1	1	1.6432	0.5774
% of Total N	18.5185	18.5185	18.5185	18.5185	18.5185	33.3333
% of Total Sum	18.5185	17.6	18.8679	17.0940	12.9630	33.3333

	Suppliers	Government	Price	Consistency	Teamwork	Depend
Mean				5	4	
N				1	1	
Std. Deviation				.	.	
% of Total N				20	33.3333	
% of Total Sum				20.8333	28.5714	

Chemicals, Petroleum, Rubber and Plastics

	Quality	Cost	Flexibility	Time/Speed	nnovativenes	Staff
Mean	5	4.6666667	4	4.1666667	4.5	5
N	6	6	6	6	6	2
Std. Deviation	0	0.5164	1.0954	0.9832	0.5477	0
% of Total N	22.2222	22.2222	22.2222	22.2222	22.2222	22.222
% of Total Sum	22.2222	22.4	22.6415	21.3675	25	23.810

	Suppliers	Government	Price	Consistency	Teamwork	Depend
Mean	5	5	4	4	5	4
N	2	2	2	1	1	3
Std. Deviation	0	0	0	.	.	1
% of Total N	33.3333	50	100	20	33.3333	60
% of Total Sum	35.7143	52.6316	100	16.6667	35.7143	57.143

Non-metallic Mineral Products except Petroleum

	Quality	Cost	Flexibility	Time/Speed	nnovativenes	Staff
Mean	5	5	4.3333	4	3.6667	4
N	3	3	3	3	3	1
Std. Deviation	0	0	0.5774	1	1.1547	.
% of Total N	11.1111	11.1111	11.1111	11.1111	11.1111	11.111
% of Total Sum	11.1111	12	12.2642	10.2564	10.1852	9.524

	Suppliers	Government	Price	Consistency	Teamwork	Depend
Mean						5
N						1
Std. Deviation						.

% of Total N	
% of Total Sum	20 23.810

Metal industries

	Quality	Cost	Flexibility	Time/Speed	nnovativenes	Staff
Mean	5	4.75	3.75	4.5	3.75	4
N	4	4	4	4	4	1
Std. Deviation	0	0.5	0.9574	0.5774	1.5	.
% of Total N	14.8148	14.8148	14.8148	14.8148	14.8148	11.111
% of Total Sum	14.8148	15.2	14.1509	15.3846	13.8889	9.524

	Suppliers	Government	Price	Consistency	Teamwork	Depend
Mean	5	5				
N	2	1				
Std. Deviation	0	.				
% of Total N	33.3333	25				
% of Total Sum	35.7143	26.3158				

Other Industries

	Quality	Cost	Flexibility	Time/Speed	nnovativenes	Staff
Mean	5	5	4.5	4.5	4.5	5
N	2	2	2	2	2	1
Std. Deviation	0	0	0.7071	0.7071	0.7071	.
% of Total N	7.4074	7.4074	7.4074	7.4074	7.4074	11.111
% of Total Sum	7.4074	8	8.4906	7.6923	8.3333	11.905

	Suppliers	Government	Price	Consistency	Teamwork	Depend
Mean				5		
N				1		
Std. Deviation				.		
% of Total N				20		
% of Total Sum				20.8333		

Total for all Industries

	Quality	Cost	Flexibility	Time/Speed	nnovativenes	Staff
Mean	5	4.6296	3.9259	4.3333	4	4.667
N	27	27	27	27	27	9
Std. Deviation	0	0.5649	0.8738	0.7845	1.1767	0.5
% of Total N	100	100	100	100	100	100
% of Total Sum	100	100	100	100	100	100

	Suppliers	Government	Price	Consistency	Teamwork	Depend
Mean	4.6667	4.75	4	4.8	4.6667	4.2
N	6	4	2	5	3	5
Std. Deviation	0.8165	0.5	0	0.4472	0.5774	0.837
% of Total N	100	100	100	100	100	100
% of Total Sum	100	100	100	100	100	100

Statistics

	Firms	Ownership (	Market for pro	Belief	Class. Of Company
N	27	27	27	27	27
Mean	14	2	2.2593	1	2.9259

Median	14	2	3	1	3
Mode	27	3	3	1	1
Std. Deviation	7.9373	1	0.9842	0	1.6391
Sum	378	54	61	27	79

	Range of products	Manufacturi	Annual Turnov	Price	Consistency
N	27	27	27	2	5
Missing	0	0	0	25	22
Mean	3.4074	4.2222	1.5556	4	4.8
Median	4	4	1	4	5
Mode	4	4	1	4	5
Std. Deviation	0.8439	0.8006	0.7511	0	0.4472
Sum	92	114	42	8	24

	Quality	Cost	Flexibility	Time/Speed	Innovativene	Staff
N	27	27	27	27	27	9
Mean	5	4.6296	3.9259	4.3333	4	4.667
Median	5	5	4	5	4	5
Mode	5	5	4	5	5	5
Std. Deviation	0	0.5649	0.8738	0.7845	1.1767	0.5
Sum	135	125	106	117	108	42

	Teamwork	dependabilit	Investment	new product	Suppliers	Gov
N	3	5	27	27	6	4
Missing	24	22	1.2963	4.7407	4.6667	4.75
Mean	4.6667	4.2	1	5	5	5
Median	5	4	1	6	5	5
Mode	5	5	0.4653	1.3472	0.8165	0.5
Std. Deviation	0.5774	0.8367	35	128	28	19

a = Multiple modes exist. The smallest value is shown

Appendix 2: Non-Parametric Tests
NPar Tests

Kruskal-Wallis Test for Classification Of Classfication

Ranks

	Class	N	Mean Rank
Quality	1	7	13
	2	5	13
	3	6	13
	4	3	13
	5	4	13
	Total	25	
Flexibility	1	7	10.2857
	2	5	13.8
	3	6	14.5
	4	3	16.6667
	5	4	11.75
	Total	25	
Innovativenes	1	7	16.1429
	2	5	7.6
	3	6	15.5
	4	3	10.6667
	5	4	12.25
	Total	25	
Government	1	1	1
	3	2	3
	5	1	3
	Total	4	
Consistency	1	2	3
	2	1	3
	3	1	1
	Total	4	
dependability	1	1	2.5
	3	3	2.6667
	4	1	4.5
	Total	5	
Cost	1	7	11.7143
	2	5	10.3
	3	6	13.5
	4	3	17.5
	5	4	14.5
	Total	25	
Time/Speed	1	7	16.1429
	2	5	10.6
	3	6	12
	4	3	10.3333
	5	4	14
	Total	25	
Staff	1	1	6
	2	3	4.6667
	3	2	6
	4	1	2
	5	1	2
	Total	8	
Suppliers	1	2	2.5
	3	2	4
	5	2	4
	Total	6	
Teamwork	1	1	2.5
	2	1	1
	3	1	2.5
	Total	3	
Price a	3	2	1.5
	Total		

a=There is only one non-empty group. Kruskal-Wallis Test cannot be performed.

Test Statistics a,b

	Quality	Cost	Flexibility	Time/Spee	Innovativeness
Chi-Square	0	3.1182	2.3560	2.8728	5.6171
df	4	4	4	4	4
Asymp. Sig.	1	0.5382	0.6706	0.5793	0.2296

	Suppliers	Government	Consistenc	Teamwork	Staff
Chi-Square	2.0000	3	3	2	4.511111
df	2	2	2	2	4
Asymp. Sig.	0.3679	0.2231	0.2231	0.3679	0.3412

a=Kruskal Wallis Test
b=Grouping Variable: Classification Of Company

Kruskal-Wallis Test for Markets of products
Ranks

	Market for products	N	Mean Rank
Quality	Local	10	14
	Both Local&Export	17	14
	Total	27	
Cost	Local	10	15.9
	Both Local&Export	17	12.8824
	Total	27	
Staff	Local	3	5
	Both Local&Export	6	5
	Total	9	
Suppliers	Local	1	4
	Both Local&Export	5	3.4
	Total	6	
Government	Local	2	2
	Both Local&Export	2	3
	Total	4	
Price	Local	1	1.5
	Both Local&Export	1	1.5
	Total	2	
Flexibility	Local	10	15.4
	Both Local&Export	17	13.1765
	Total	27	
Time/Speed	Local	10	13.7
	Both Local&Export	17	14.1765
	Total	27	
Innovativenes	Local	10	14.25
	Both Local&Export	17	13.8529
	Total	27	
Consistency	Local	2	3.5
	Both Local&Export	3	2.6667
	Total	5	
Teamwork	Local	1	2.5
	Both Local&Export	2	1.75
	Total	3	
dependability	Local	3	3.8333
	Both Local&Export	2	1.75
	Total	5	

Test Statistics a,b

	Quality	Cost	Flexibility	Time/Speec	novativene	Staff
Chi-Square	0	1.3412	0.5500	0.0274	0.0178	0
df	1	1	1	1	1	1
Asymp. Sig.	1	0.2468	0.4583	0.8686	0.8938	1

	Price	Consistency	Teamwork	dependabilit	Suppliers	Government
Chi-Square	0	0.6667	0.5	2.3148	0.2	1
df	1	1	1	1	1	1
Asymp. Sig.	1	0.4142	0.4795	0.1281	0.6547	0.3173

a=Kruskal Wallis Test
b=Grouping Variable: Market for products

Kruskal-Wallis Test for Range of produts

Ranks

	Range of products	N	Mean Rank
Quality	1 - 5	1	14
	6 - 10	3	14
	11 - 15	7	14
	Above 15	16	14
	Total	27	
Cost	1 - 5	1	18.5
	6 - 10	3	18.5
	11 - 15	7	14.7857
	Above 15	16	12.5313
	Total	27	
Flexibility	1 - 5	1	14.5
	6 - 10	3	17.5
	11 - 15	7	12.5714
	Above 15	16	13.9375
	Total	27	

	Range of products	N	Mean Rank
Time/Speed	1 - 5	1	20.5
	6 - 10	3	13.1667
	11 - 15	7	13.2857
	Above 15	16	14.0625
	Total	27	
Innovativenes	1 - 5	1	11.5
	6 - 10	3	15.3333
	11 - 15	7	13.3571
	Above 15	16	14.1875
	Total	27	
Staff	6 - 10	2	6.5
	11 - 15	2	6.5
	Above 15	5	3.8
	Total	9	
Suppliers	1 - 5	1	4
	11 - 15	2	4
	Above 15	3	3
	Total	6	
Government	6 - 10	1	1
	11 - 15	1	3
	Above 15	2	3
	Total	4	
Consistency	6 - 10	3	3.5
	Above 15	2	2.25
	Total	5	
Teamwork	11 - 15	1	2.5
	Above 15	2	1.75
	Total	3	
dependability	1 - 5	1	1
	11 - 15	1	2.5
	Above 15	3	3.8333
	Total	5	
Price	1 - 5	1	1.5
	Above 15	1	1.5
	Total	2	

Test Statistics a,b

	Quality	Cost	Flexibility	Time/Speed	novativene	Staff
Chi-Square	0	2.8032	0.9073	0.9180	0.2698	3.2

df	3	3	3	3	3	2
Asymp. Sig.	1	0.4230	0.8237	0.8211	0.9656	0.2019

	Government	Price	Consistenc	Teamwork	ependabilit	Suppliers
Chi-Square	3	0	1.5	0.5	2.8148	1
df	2	1	1	1	2	2
Asymp. Sig.	0.2231	1	0.2207	0.4795	0.2448	0.6065

a=Kruskal Wallis Test

b=Grouping Variable: Range of products

Kruskal-Wallis Test - ownership of company

Ranks

	Ownership of Company	N	Mean Rank
Quality	Local	13	14
	Foreign	1	14
	Both Foreign& Local	13	14
	Total	27	
Cost	Local	13	14.1538
	Foreign	1	18.5
	Both Foreign& Local	13	13.5
	Total	27	
Flexibility	Local	13	13.1154
	Foreign	1	23.5
	Both Foreign& Local	13	14.1538
	Total	27	
Time/Speed	Local	13	16.6154
	Foreign	1	9.5
	Both Foreign& Local	13	11.7308
	Total	27	
	Ownership of Company	N	Mean Rank
Innovativenes	Local	13	13.0385
	Foreign	1	11.5
	Both Foreign& Local	13	15.1538
	Total	27	
Staff	Local	3	5
	Both Foreign& Local	6	5
	Total	9	
Suppliers	Local	2	2.5
	Both Foreign& Local	4	4
	Total	6	
Government	Local	2	2
	Both Foreign& Local	2	3
	Total	4	
Price a	Both Foreign& Local	2	1.5
	Total	2	
Consistency	Local	2	3.5
	Both Foreign& Local	3	2.6667
	Total	5	
Teamwork	Local	2	1.75
	Foreign	1	2.5
	Total	3	
dependability	Local	2	3.5
	Both Foreign& Local	3	2.6667
	Total	5	

a=There is only one non-empty group. Kruskal-Wallis Test cannot be performed.

Test Statistics a,b

	Quality	Cost	Flexibility	Time/Spee	Innovativeness
Chi-Square	0	0.5569	1.7798	3.3706	0.6384
df	2	2	2	2	2
Asymp. Sig.	1	0.7570	0.4107	0.1854	0.7267

	Government	Consistency	Teamwork	Staff	Suppliers
Chi-Square	1	0.6667	0.5	0	2
df	1	1	1	1	1

Asymp. Sig.	0.3173	0.4142	0.4795	1	0.157299

a=Kruskal Wallis Test
b=Grouping Variable: Ownership of Company

Kruskal-Wallis Test manufacturing processes

Ranks

	Manufacturing Processes	N	Mean Rank
Quality	Mechanical	2	14
	Both Mechanical & Manual	15	14
	All of the above	10	14
	Total	27	
Cost	Mechanical	2	12
	Both Mechanical & Manual	15	13.8667
	All of the above	10	14.6
	Total	27	
Flexibility	Mechanical	2	14.5
	Both Mechanical & Manual	15	14.5
	All of the above	10	13.15
	Total	27	
dependability	Mechanical	1	4.5
	Both Mechanical & Manual	1	4.5
	All of the above	3	2
	Total	5	
Consistency	Both Mechanical & Manual	2	3.5
	All of the above	3	2.6667
	Total	5	
Teamwork	Mechanical	1	2.5
	Both Mechanical & Manual	2	1.75
	Total	3	
Time/Speed	Mechanical	2	20.5
	Both Mechanical & Manual	15	12.1667
	All of the above	10	15.45
	Total	27	
Innovativenes	Mechanical	2	16.5
	Both Mechanical & Manual	15	11.2333
	All of the above	10	17.65
	Total	27	
Staff	Mechanical	1	6.5
	Both Mechanical & Manual	4	4.25
	All of the above	4	5.375
	Total	9	
Suppliers	Both Mechanical & Manual	2	2.5
	All of the above	4	4
	Total	6	
Government	Mechanical	1	3
	Both Mechanical & Manual	2	2
	All of the above	1	3
	Total	4	
Price	Both Mechanical & Manual	1	1.5
	All of the above	1	1.5
	Total	2	

Test Statistics a,b

	Quality	Cost	Flexibility	Time/Speed	novativene	Staff
Chi-Square	0	0.2776	0.2028	2.9845	4.6750	1
df	2	2	2	2	2	2
Asymp. Sig.	1	0.8704	0.9036	0.2249	0.0966	0.6065

	Government	Price	Consistenc	Teamwork	lependabilit	Suppliers
Chi-Square	1	0	0.6667	0.5	3.3333	2
df	2	1	1	1	2	1
Asymp. Sig.	0.6065	1	0.4142	0.4795	0.1889	0.1573

a=Kruskal Wallis Test
b=Grouping Variable: Manufacturing Processes

Kruskal-Wallis Test- Annual Turnover

Ranks

	Annual Turnover	N	Mean Rank
Quality	Upto 500 Million	16	14
	Above 500m to 1b	7	14
	Above 1b to 5b	4	14
	Total	27	
Cost	Upto 500 Million	16	13.3438
	Above 500m to 1b	7	16.6429
	Above 1b to 5b	4	12
	Total	27	
Flexibility	Upto 500 Million	16	11.9688
	Above 500m to 1b	7	17.0714
	Above 1b to 5b	4	16.75
	Total	27	
Time/Speed	Upto 500 Million	16	12.6875
	Above 500m to 1b	7	15.7857
	Above 1b to 5b	4	16.125
	Total	27	
Innovativenes	Upto 500 Million	16	13.8125
	Above 500m to 1b	7	13.7857
	Above 1b to 5b	4	15.125
	Total	27	
Staff	Upto 500 Million	5	4.7
	Above 500m to 1b	4	5.375
	Total	9	
Suppliers	Upto 500 Million	3	3
	Above 500m to 1b	2	4
	Above 1b to 5b	1	4
	Total	6	
Government	Upto 500 Million	2	2
	Above 500m to 1b	2	3
	Total	4	
Price	Upto 500 Million	1	1.5
	Above 1b to 5b	1	1.5
	Total	2	
Consistency	Upto 500 Million	3	3.5
	Above 500m to 1b	1	3.5
	Above 1b to 5b	1	1
	Total	5	
Teamwork	Upto 500 Million	2	1.75
	Above 500m to 1b	1	2.5
	Total	3	
dependability	Upto 500 Million	3	3.1667
	Above 500m to 1b	1	4.5
	Above 1b to 5b	1	1
	Total	5	

Test Statistics

	Quality	Cost	Flexibility	Time/Speec	novativene	Staff
Chi-Square	0	1.6791	2.8677	1.3004	0.1067	0.2
df	2	2	2	2	2	1
Asymp. Sig.	1	0.4319	0.2384	0.5219	0.9480	0.6547

	Government	Price	Consistenc	Teamwork	ependabili	Suppliers
Chi-Square	1	0	4	0.5	2.814815	1
df	1	1	2	1	2	2
Asymp. Sig.	0.3173	1	0.1353	0.4795	0.2448	0.6065

a=Kruskal Wallis Test

b=Grouping Variable: Annual Turnover

Kruskal-Wallis Test Level of Investment

Ranks

	Investment Level	N	Mean Rank
Quality	1	19	14

	2	8	14
	Total	27	
Cost	1	19	15.0789
	2	8	11.4375
	Total	27	
Flexibility	1	19	15.2105
	2	8	11.125
	Total	27	
Time/Speed	1	19	13.3421
	2	8	15.5625
	Total	27	
Innovativenes	1	19	13.5
	2	8	15.1875
	Total	27	
dependability	1	4	3.5
	2	1	1
	Total	5	
Staff	1	7	4.5714
	2	2	6.5
	Total	9	
Suppliers	1	3	4
	2	3	3
	Total	6	
Government	1	4	2.5
	Total	4	
Price	1	1	1.5
	2	1	1.5
	Total	2	
Consistency	1	3	2.6667
	2	2	3.5
	Total	5	
Teamwork	1	2	2.5
	2	1	1
	Total	3	

a=There is only one non-empty group. Kruskal-Wallis Test cannot be performed.

Test Statistics

	Quality	Cost	Flexibility	Time/Spee	Innovativeness
Chi-Square	0	1.7462	1.6603	0.5312	0.2877
df	1	1	1	1	1
Asymp. Sig.	1	0.1864	0.1976	0.4661	0.5917

	Suppliers	Price	Consistend	Teamwork	Staff
Chi-Square	1.0000	0	0.6667	2	1.142857
df	1	1	1	1	1
Asymp. Sig.	0.3173	1	0.4142	0.1573	0.2850

a Kruskal Wallis Test
b Grouping Variable: Investment Level

NPar Tests

Note that in the following test:
There are not enough valid cases to perform the Kruskal-Wallis Test for Price * Rate of new products introduction and Teamwork * Rate of new products

Kruskal-Wallis Test Number of new products introduced

Ranks

	Rate of new products intro	N	Mean Rank
Quality	Quarterly	1	8
	Semi-annually	6	8
	Annually	4	8
	As need be	4	8
	Total	15	

Flexibility	Quarterly	1	1
	Semi-annually	6	8.5
	Annually	4	8.5
	As need be	4	8.5
	Total	15	
Time/Speed	Quarterly	1	11
	Semi-annually	6	9.8333
	Annually	4	6.75
	As need be	4	5.75
	Total	15	
Innovativenes	Quarterly	1	11.5
	Semi-annually	6	8
	Annually	4	10
	As need be	4	5.125
	Total	15	
Staff	Quarterly	1	2.5
	Semi-annually	2	2.5
	Annually	1	2.5
	Total	4	
Cost	Quarterly	1	10
	Semi-annually	6	6.1667
	Annually	4	8.25
	As need be	4	10
	Total	15	
Suppliers	Quarterly	1	3
	Semi-annually	1	1
	Annually	2	3
	Total	4	
Government	Quarterly	1	2.5
	Semi-annually	1	2.5
	As need be	1	1
	Total	3	
Consistency	Semi-annually	1	3
	Annually	2	2
	As need be	1	3
	Total	4	
Dependability	Quarterly	1	2.5
	Semi-annually	1	4
	Annually	2	1.75
	Total	4	

Test Statistics a,b

	Quality	Cost	Flexibility	Time/Spee	Innovativeness
Chi-Square	0	3.3681	3.0435	3.7111	3.6919
df	3	3	3	3	3
Asymp. Sig.	1	0.3383	0.3850	0.2944	0.2967

	Suppliers	Government	Consistend	dependabil	Staff
Chi-Square	3	2	1	2.25	0
df	2	2	2	2	2
Asymp. Sig.	0.2231	0.3679	0.6065	0.3247	1

a=Kruskal Wallis Test

b=Grouping Variable: Rate of new products Introduction

APPENDIX 3: RESPONDENTS

Listed Alphabetically

Afrolite Industries

Associated Battery Manufacturers

Baumann Ltd

Beta Healthcare

Unilever Kenya

Coca-Cola

Colgate Palmolive

Cosmo Plastics

Cussions and Company

Francescon marble and granite

Highland Canners

Kenya Orchards Ltd

Kenya Times Printing

Kuguru Food Complex

Mabati Rolling Mills(Galsheet)

Megh Cushions

Proctor and Allan

Reckitt Beckiniser EA

Seracoatings

Sunflag

Tetra Pak

The Jomo Kenyatta Foundation

Trufoods

Twiga Chemicals

Victoria Industries

Wood Manufacturers Limited

APPENDIX 4

OPERATIONS STRATEGY QUESTIONNAIRE

I appreciate your participation in this survey study is which is conducted by an MBA student from the University of Nairobi's Faculty of Commerce. The survey studies the operations strategy practices of large manufacturing firms in Kenya. Please try to respond to every question from the official point of view of the company.

Your responses are for research only and are neither right nor wrong. The information you give will be treated in strict confidence. A copy of the final paper of the research will be availed to you or your company on request. Thanks for your assistance.

PART I: COMPANY PROFILE

1. Name of Company _____
2. Location _____
3. Position of Respondent _____
4. Educational level of the respondent (optional) _____
5. Training of the respondent (optional) _____
6. Experience of the respondent (optional) _____
7. How can you describe the ownership of your company? (Please tick one)
   - ❑ Local
   - ❑ Foreign
   - ❑ Both (local & Foreign)
8. The best classification of your manufacturing operations is
   - ❑ Food, beverage and tobacco
   - ❑ Wood , wood products, paper products, printing and publishing
   - ❑ Chemicals, petroleum, rubber and plastics
   - ❑ Non-metallic mineral products except petroleum
   - ❑ Basic metal industries, Metal Products, machinery and equipment
   - ❑ Other (please specify)_____

9. The market for your products is

- ❑ Local
- ❑ Export
- ❑ Both local and export

10. Which of the following best describes the number of different types of products that you manufacture?

- ❑ 1-5
- ❑ 6-10
- ❑ 11-15
- ❑ 15 and above

1. For each of the products in (10) above please indicate the number of sizes you make
   a) .....
   b) .....
   c) .....
   d) .....
   e) .....
   f) .....
   g) .....
   h) .....
2. Which of the following best describes your manufacturing process(es)?
   [ ] Automated/Computerised
   [ ] Mechanical
   [ ] Manual
   [ ] Both Mechanical and manual
   [ ] All of the above
3. What is your Company's annual turnover in KShs?
   - ❑ Up to 500 million
   - ❑ 500 million to 1 billion
   - ❑ 1 billion to 5 billion

- ❑ Over 5 billion

4. Which of the following best describes your company's level of investment in Kshs.?

- ❑ Up to 500 Million
- ❑ 500 Million to 1 billion
- ❑ 1 billion to 5 billion
- ❑ Over 5 billion

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

- ❑ Monthly
- ❑ Quarterly
- ❑ Semi-annually
- ❑ Annually
- ❑ Other (please specify)_____

PART II – OPERATIONS STRATEGY

1. Does your company consider manufacturing/operations strategy as enhancing long-term business performance and success? (Please tick one)

[ ] Yes [ ] Not Sure [ ] No

2. On a scale of 1 to 5 (where 5 is most important and 1 least important) please indicate the importance attached to each of the factors of operations strategy by your company by putting it in the right hand column.

1 2 3 4 5

	Factors	**Level of Importance**
(a)	Quality of products	
(b)	Cost	

(c)	Flexibility	
(d)	Time/speed	
(e)	Innovativeness	
(f)	Others (please specify)	
	(i)	
	(ii)	
	(iii)	

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

(a) Quality

(b) Cost

(c) Flexibility

(d) Innovativeness

(e) Time/Speed

(f) Others (Please specify)

---

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

a) Quality

---

b) Cost

---

c) Flexibility

---

d) Innovativeness

---

e) Time/Speed

---

f) Others (Please specify)

---

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

a) Quality

---

b) Cost

---

c) Flexibility

---

d) Innovativeness

---

e) Time/Speed

---

f) Others (Please specify)

---

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

a) Quality

---

b) Cost

---

c) Flexibility

---

d) Innovativeness

---

e) Time/Speed

---

f) Others (Please specify)

---

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

[ ] Quarterly [ ] Semi-annually

[ ] Annually [ ]Other (please specify).....

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

(a) Formulation

(b) Implementation

(c) Evaluation

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9. Please give any other information/comments that you consider to be useful to this study.
