

**THE ROLE OF SPECIFICATION IN PRODUCT QUALITY MANAGEMENT ON  
SUPPLY CHAIN PERFORMANCE: A CASE OF KENYA MEDICAL SUPPLIES  
AGENCY**

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**ABSTRACT**

Specification which represents product requirements is the formulation of the initial need into technical documents that may contain technical quality standards, a methodology of purely a set of deliverables. Quality management as a management approach of an organization is centered on quality, based on the participation of all its members and aiming at long term success and is achieved through customer satisfaction and benefits to all members of the organization and to society. Precise and clear specifications are prerequisite for bidders to respond realistically and competitively to the requirements of the Purchaser/Employer without qualifying or conditioning their bids. This study will seek to find out the role of specification in quality management on supply chain performance; a case of KEMSA. The objectives of the study include Customer focus, Government policy, Managerial skills and Technology so as to establish their relationship with supply chain performance within KEMSA. The target population of this study will include 46 KEMSA staff stratified into the different department. Due to the small size of the population, the study will comprise of a sample size of 46 respondents who will be from the target population. Primary data will be gathered using semi-structured questionnaires issued to each of the respondents which will be self-administered. Secondary data will be gathered from published, articles reviewing theoretical and empirical information relevant to the study. In the

analysis of data, descriptive analysis will be employed; this will include the use of weighted means, standard deviation, relative frequencies and percentages. SPSS computer software will also be used for analysis to generate data using Spearman's correlation coefficient statistical method. Content analysis method will be applied in analyzing the data that will be gathered using open ended questions. The findings will be presented using tables and charts.

**Key Words:** *Specification, Product Quality Management, Supply Chain Performance, Kenya Medical Supplies Agency*

### Introduction

Recent empirical research has documented the importance of specialization across both the horizontal and the vertical (quality) dimensions of goods to characterize the current patterns of trade. Existing models tend to concentrate on only one of these two dimensions and neglect their possible connections. However, there is evidence suggesting that these connections may be important. In today's intense competitive environment is the key to sustainable competitive advantage, in terms of supply chain and provide high quality services. In today's global market, a company's success will depends heavily on its coordinate ability to a complex network of business relationships among supply chain member (Keebler Manrodt, Dutsche, and Ledyard, 1999; Anvariostami and Alimohammadlou, 2004).

Today's business environment is characterized by increased competition and more forward fighting is going on to win every day (Gilaninia, Taleghani, Mousavian, Kouchaki, Ghoreishi, Shahidi, Zadbagher and Seighalani., 2011). Today the Institute with severe challenges and competitive market pressures, including globalization, competition and cooperation, diversity of customer requirements and short product life cycle and supply chain are facing as a principle has been considered (Rezvani; Gilaninia, Mousavian, 2011). Supply chain management is attention field of many researchers in different fields. Supply chain was introduced in the 1990s, when was form issues related to the circulation materials.

The idea of improving products and services through SCM; including to reduce the production time and cost without compromising the product quality, is that the managers have to work cooperatively with other organisations in the SC (Handfield & Nichols, 1999). Eventually, through mutual understanding between them and ability to reduce the risks of uncertainties in production processes, higher degree of efficiency can be achieved. Though originally it was used mainly in manufacturing industry to improve responsiveness and flexibility, and has been found to also improve organisational competitiveness (Gunasekaran, 2004), SCM has now been

recognised by many to be an important strategic tool for organisation's efficiency and to gain competitive advantage.

### **Product Quality Management– Global Perspective**

In the last few years industrial companies in Denmark have experienced increasing demands for products made to customer specifications or adapted to a particular customer. In the same period of time the rapid development of information technology and of technology for product data management have enabled dramatic changes in the company's processes within sales, design and methods engineering to take place. The overall goal is to reduce the time spent on preparing specification (Christiansen, 1996)

Schott (2004), Hummels and Klenow (2005), and Khandelwal (2007), among others, have shown strong evidence of the significance of the quality dimension in characterizing supply chain performance. Horizontal specialization (specialization across goods) seems to be fading, while vertical specialization (specialization within goods along the quality dimension) is becoming increasingly important (Schott, 2004). Still, the importance of the horizontal dimension of specialization cannot be underestimated. Hummels and Klenow (2005) show that this dimension plays a key role in the expansion of exports as countries become richer. They found that a 10-percent increase in per capita income brings about, on average, an 8.5-percent increase in the range of goods being exported (the extensive margin of exports) and a 0.9-percent increase in the unit price of exports (the quality margin, with unit price interpreted as a proxy for quality). Along the same lines, Kehoe and Ruhl (2002) showed that the extensive margin accounts for the bulk of trade growth after trade liberalizations. Ideally, trade models should be able to incorporate both the horizontal and the vertical dimensions of specialization.

There are several general equilibrium models analyzing the patterns of country specialization along the quality dimension (Flam & Helpman 1987, Falvey and Kierzkowski 1987, Grossman and Helpman 1991, Stokey 1991, and Murphy and Shleifer 1997, among others). They predict that richer countries specialize in producing higher quality, which conforms to the general evidence in Schott (2004), and Hummels and Klenow (2005). The main underlying argument is that richer countries have a larger endowment in human or physical capital which provides a comparative advantage in producing higher quality.

Specification represents the documents of requirements; it is the formulation of the initial need into technical documents that may contain any of the following, process assets of technical quality standards, a methodology of purely a set of deliverables. Company adopts several techniques like brand names, technical specification, functional specification, performance specification, composition specification. Crosby (2006) defines quality as conformity to requirement not goodness. He also stresses that the definition of quality can never make any sense unless it is based on what the customer wants that a product is a quality product only when

it conforms to the customer's requirements. Quality does not only refer to principle such as inspection, process control, auditing, standard and ISO 9000. It also refers to things like management systems, your customer service, product offerings and wellbeing of your staff. By adopting a policy of quality, you will be incorporating one of the critical factors to success in your business. As a business owner you need a competitive edge over other business owners and quality is this critical factor whether you are doing business locally or internationally. Lastly business success is inextricably linked with proper specification, quality and staying power (Barclays Bank Journal, 2004)

Gunasekaran, Patel and McGaughey (2001) explored that SCM needs to be assessed for its performance in order to evolve an efficient and effective supply chain. Muhammad (2004) defines SCM performance as the measurement of performance of current SCM activities or practices by any particular firm. To measure performance of SCM activities practiced by firms, five dimensions of measurement are used, namely Supply Chain Flexibility, Supply Chain Integration, Responsiveness to Customers, Supplier Performance, and Partnership Quality.

### **Product Quality Management – Kenyan Perspective**

Total quality management is an enhancement to the traditional way of doing business. It is a proven technique to guarantee survival in world class competition. Only by changing the actions of management will the culture and actions of an entire organization be transformed. Total quality management (TQM) as a management approach of an organization is centered on quality, based on the participation of all its members and aiming at long term success. This is achieved through customer satisfaction and benefits to all members of the organization and to society. In other words, TQM is a philosophy for managing an organization in a way, which enables it to meet stakeholders' needs and expectations efficiently and effectively without compromising ethical values (ISO 8402, 1994).

In Kenya, there are various quality regulatory bodies charged with the mandate of ensuring quality in different sectors. For example, the quality assurance regulatory body in Kenya (Commission of Higher Education) recognizes that quality assurance is primarily the responsibility of individual universities (Ngware, 2006). The Kenya Bureau of Standards (KEBS) is a government agency responsible for governing and maintaining the standards and practices of metrology in Kenya. The aims and objectives of KEBS include preparation of standards relating to products, measurements, materials, processes, etc. and their promotion at national, regional and international levels; certification of industrial products; assistance in the production of quality goods; quality inspection of imports at ports of entry; improvement of measurement accuracies and dissemination of information relating to standards (KEBS, 2008).

## **Kenya Medical Supplies Agency (KEMSA)**

According to the KEMSA Procurement Review Report (2008) The Kenya Medical Supplies Agency (KEMSA) is a State Corporation established by a legal notice issued under CAP 466 of the Laws of Kenya. The organization is a specialized medical logistics provider for Ministries of Medical Services/Public Health-supported health facilities and programmes under donor funding.

The Agency was formed on 11th February 2000 as a result of recommendations of a health stakeholders' forum dubbed "Strategies for Reforming the Drug and Medical Supplies Systems in Kenya" held between June 7 and 10, 1998.

KEMSA's core functions include procurement, warehousing and distribution of medical supplies. In performing these functions, KEMSA's mission is to improve the healthcare of Kenyans through efficient procurement and reliable distribution of quality medical commodities and promotion of rational drug use and practices. While, KEMSA's vision is to be to be the leading supplier of quality and affordable essential medical commodities to health facilities in Kenya, both the KEMSA mission and vision statements support the Ministry of Medical Services and Ministry of Public Health & Sanitation Mission, Vision and objectives as articulated in the National Health Sector Strategic Plan (NHSSP) II 2005-2010

According to the KEMSA procurement Review Report (2008) there was no comprehensive consolidated annual procurement plan prepared by procurement unit for some tenders and contracts. Concerns were also raised over the inadequate pre-procurement planning that at times contributed to non-payment of suppliers. Clear procurement documentation, including objectives, scope, deliverables, timing, progress, and payment reporting must be established. All these are risks elements which will affect the performance of the supply chain function within the organization and therefore the need for a risk management strategy

## **Statement of the Problem**

According to World Bank Procurement Manual (2001), precise and clear specifications are prerequisite for bidders to respond realistically and competitively to the requirements of the Purchaser/Employer without qualifying or conditioning their bids. The Public Procurement and Disposal Act asserts that specification being both functional and technical, proper specification leads to all commodities specified to be suitable for intended purpose when put into use (PPDA, 2005). According to the Public Procurement and Disposal General Manual (2006), specifications are crucial to the success of procurement. However, if specification is not clear, accurate and complete, it will result into disruption and delay in the supply and implementation of projects (PPDGM, 2006).

A recent study conducted by Accenture (2010) in collaboration with Stanford, and INSEAD found that 89% of senior executives at leading companies view supply management to be critical or very important to their company, and 89% also agreed that investments in supply chain capabilities have increased in the last three years. Further, 9% of the surveyed companies were identified as leaders in supply management and were found to demonstrate significantly higher financial performance than their competition.

Researchers have studied some related problems of quality management in supply chain. Noori (2006) investigated the implementation of continuous collaborative improvement activities in the supply chains of Canadian industries, including the automotive, electronics and aerospace sectors. Zhang, Chang and Yu (2006) analyzed effect of product structure on supply chain quality control decision. Mohamed, Parry, L.E. & Wharton, R. (2008) explored the relationship between first, second, and third tier suppliers in the automotive industry and the interconnection between ensuring quality and providing efficiencies in the supply chain. Ma, Lin, and Chen (2000) identified the factors that influence supply chain quality management using empirical data collected from Taiwan and Hong Kong and found out that quality management practices are significant correlated with the supplier selection strategy. Stanley & Wisner (2001) discussed the association between implementation of cooperative purchasing/supplier relationships, internal service quality, and an organization's ability to provide quality products and services to its external customers. Locally, there is no study that has ever been carried on specification in product quality and it is against this back ground that this study seeks to evaluate the role of specifications in product quality management on supply chain performance.

## **Literature Review**

This chapter reviews relevant literature in line with the objectives of the study to evaluate the role of specifications in product quality management on supply chain performance. The chapter develops a conceptual framework that will be used in the study in regard to each variable in the study. The review will critique the existing literature and identify research gaps. In this chapter literature is in relation to the variable, that is; specification in product quality management and supply chain performance is reviewed as evidenced by different authors.

Burns and Grove (2003) define a theory as an integrated set of defined concepts and statements that present a view of a phenomenon and can be used to do one or more of the following: describe, explain, predict, or control the phenomenon. Conceptual models are similar to, but more abstract than theories. Each model broadly explains phenomena of interest, expresses assumptions, and reflects a philosophical stance" (Burns & Grove, 2003).

This was put forward by Jensen and Meckling(1976). Agency theory discusses problems of measuring individual performances and the importance of incentives in vertically integrated firms (Jensen and Meckling, 1976; Eisenhardt, 1985). The agency theory provides a useful explanation in evaluating the performance of an individual exchange party. The agency theory

explains how to best organize relationships in which one party (the principal) determines the work, which another party (the agent) undertakes (Eisenhardt, 1985). This theory states that under conditions of incomplete information and uncertainty, which characterize most business settings, two agency problems arise: adverse selection and moral hazard. Adverse selection is the condition under which the principal cannot ascertain if the agent accurately represents his ability to do the work for which he is being paid. Moral hazard is the condition under which the principal cannot be sure if the agent has put forth maximal effort (Eisenhardt, 1985).

For supporters of the Agency theory, managers are but one of a number of important stakeholder groups. Like customers, suppliers, employees, and local communities, they have a stake in, and are affected by, the firm's success or failure. According to one typical formulation of the claim, "In the same way that a business owes special and particular duties to its investors...it also has different duties to the various stakeholder groups (Jensen and Meckling, 1976). The firm and its managers have special obligations to ensure that the shareholders receive a "fair" return on their investment; but the firm also has special obligations to other stakeholders, which go above and beyond those required by law. In cases where these interests conflict, the demands and interests of some stakeholders, including shareholders, must be moderated or sacrificed in order to fulfill basic obligations to other stakeholders

### **Research Methodology**

This study employed a descriptive research design using a case study. According to Donald and Pamela (2006), a descriptive study deals with the what, how and who of a phenomenon which is the concern for this study. The study specifically analyzed the effect of the existing specification methods on the supply chain. Specifically the study focused on the KEMSA supply chain. A case study is a study focusing on one institution of the same sector and has holistic approach and offers the opportunity to explain why certain outcomes are happening by analyzing the process and relationships of those factors of outcome (Denscombe, 1998)

Population in research is defined by Saunders (2003) as the total collections of elements about which we want to make some inferences. The collection of all possible observations of a specified characteristic of interest is called population, while a collection of observations presenting only a portion of the population is called a sample. Due to the small number of the population, this study will be a census and will constitute twenty one (21) KEMSA, Ministry of Medical Services and Ministry of Public Health and Sanitation staff working in the supply chain. This is because these groups of respondents were involved in the supply chain and will be in a better position to provide accurate responses for the study.

The study used a census approach to collect data from the respondents hence no sampling techniques will be used. The approach involved gathering information from every member of the target population. This method is appropriate because it reduces on biasness in research,

since all the respondents were given an equal chance to participate in the study and there was also less logistics complexities in conducting the research since all the respondents were within Nairobi and hence were accessed easily (Mugenda and Mugenda, 2003). The population sample was composed of twenty one (21) KEMSA, Ministry of Medical Services and Ministry of Public Health and Sanitation staff working in the supply chain.

### Sampling Frame

Respondents	Total Number	Number in Sample
KEMSA Warehouse Department	8	8
KEMSA Human Resource and Admin Staff	8	8
KEMSA Procurement Unit Staff	15	15
KEMSA Quality Assurance Staff	5	5
Ministry of Medical Service department of Biomedical Engineers and Chief Nursing Officer	5	5
Ministry of Public health and Sanitation	5	5
<b>TOTAL</b>	<b>46</b>	<b>46</b>

### Summary of Findings

The study established that the top management oversees the quality control system and quality assurance of the company as shown by a mean of 4.8 and a standard deviation of 0.4; and that the company policy is to ensure quality assured that comply with and exceed the detail contractual requirements-not exceeding financial commitment but with regard to quality standard and technical specifications as shown by a mean of 4.5 and a standard deviation of 0.5; that technical specifications will improve co-ordination, monitoring, and review of process outlined in the quality plan as shown by a mean of 4.3 and a standard deviation of 0.6 and that personnel are employed on consultancy basis with the purpose of steering the technical specifications in quality management program as shown by a mean of 4.1 and a standard deviation of 0.9

The study found that respondents some suppliers find the ambiguous targets frustrating and prefer more straight forward targets as shown by a mean of 4.4; and a standard deviation of 0.5; firms provide ranges in the specifications and then narrows it down rationally as shown by a mean of 4.2 and a standard deviation of 0.7; that firm work with an excessive number of inexpensive prototypes including digital/virtual prototypes to ensure that the wrong decisions are not taken; as shown by a mean of 3.1 and a standard deviation of 0.9; Firms delay decisions and provide hard functional specifications very late in the process in order to ensure that the wrong decisions are not taken as shown by a mean of 3 and a standard deviation of 1.4

The study also found that payment for a shortfall in overall performance is paid in lieu of future expenses that will be experienced due to less than optimal performance of the unit as shown by a mean of 4.5 and a standard deviation of 0.8; that designers who utilize prescriptive specifications inherently understand that the use of supplementary materials results in a prescriptively specified

product as shown by a mean of 4.5 and a standard deviation of 0.6; that requirement, criterion and test must exist in a performance specification as shown by a mean of 4.1 and a standard deviation of 1 and that measures to assure quality are quality are standard practice and equipment are often purchased through the use of a performance warranty as shown by a mean of 4 and a standard deviation of 0.9.

In regard to the level of agreement on statements relating to composition specifications, the study found that the respondents agreed that any improvement that is made in the component will help to improve the total quality of the organization and the quality of the final product as shown by the mean of 4.7, quality cannot be an afterthought. It must be consistently measured and quantified in composition specifications as shown by the mean of 4.1, quality cannot be an afterthought. It must be consistently measured and quantified in composition specifications as shown by the mean of 4.1, and that relying on product inspection implies that errors will definitely be made as shown by the mean of 3.3.

## **Conclusions**

From the findings the study concluded that the top management oversees the quality control system and quality assurance of the company and that the company policy is to ensure quality assured that comply with and exceed the detail contractual requirements-not exceeding financial commitment but with regard to quality standard and technical specifications.

The study also concludes that firms provide ranges in the specifications and then narrows it down rationally and that firms work with an excessive number of inexpensive prototypes including digital/virtual prototypes to ensure that the wrong decisions are not taken.

The study further concludes that payment for a shortfall in overall performance is paid in lieu of future expenses that will be experienced due to less than optimal performance of the unit and that designers who utilize prescriptive specifications inherently understand that the use of supplementary materials results in a prescriptively specified product.

Finally, based on the findings, the research concludes that quality cannot be an afterthought. It must be consistently measured and quantified in composition specifications, quality cannot be an afterthought and that relying on product inspection implies that errors will definitely be made.

## **Recommendations**

This study recommends the top management to ensure that they oversee the quality control system and quality assurance of the company; ensure personnel are employed on a consultancy basis.

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