



## Assessment of Materials Management in Kenyan Manufacturing Firms

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### Abstract

*This study examined the recognition Kenyan manufacturing firms are giving to materials management and the benefits of adopting good materials management practices since long-term success and survival of any firm depends on how well their costs are managed. The study surveyed medium and large manufacturing firms based in Nairobi, Kenya. A stratified random sampling technique was used to select 55 firms while the data was collected using a structured questionnaire consisting mainly of both close-ended and open-ended questions. The data was analysed through descriptive statistics such as proportions, percentages, median and mean. 23 percent of the firms were found to recognize materials management as they had an in-charge reporting directly to the chief executive officer. However, generally Kenyan firms were not practicing professionalism in materials management and owing to the huge amount of resources they were committing on materials related activities; a lot of emphasis need to be directed towards materials management and it should be recognized as a top management function.*

**Keywords:** Materials management, manufacturing, Kenya.

### Introduction

According to Wild (1995), materials management is a concept which brings together the responsibility for determining the manufacturing requirement; scheduling the manufacturing processes and procuring; storing and dispensing materials. As such it is concerned with and controls all activities involved in the acquisition and use of all materials employed in the production of finished goods. Materials management concepts enhance communication and coordination by bringing together all functions which are interrelated. Bose (2007) explained that supply chain coordination improves all stages of the chain taking actions that together increase total supply chain profits. Supply chain coordination requires each stage of the supply chain to take into account the impact its actions have on other stages. Lack of coordination occurs either because different stages of the supply chain have objectives that conflict or because information moving between stages is delayed and distorted.

Ramakrishna (2005) noted that previously materials management was treated as a cost centre, since the Purchasing Department was spending resources on materials while Stores Department were holding huge inventories, thereby blocking money and space. However, with the process of liberation and the opening up of global economy, there has been a drastic change in the business environment, resulting in manufacturing organizations exposed to intense competition in the market place. Manufacturing firms all over the world have been working out various strategies to face the challenges and to cut down manufacturing costs to remain competitive. Ramakrishna (2005) noted that progressive management has since recognized that materials management can provide opportunities to reduce manufacturing costs and can be treated as a profit centre.

Kenyan manufacturing firms are facing competition in the current markets which has led to the need for coming up with better methods of managing and measuring how resources are utilized by various jobs or products, and therefore eliminate any wastage in the value chain. The new cost management methods require having the right professionals doing the right job. In this case, the major concern is how materials functions are organized and who is responsible over these functions in the Kenyan manufacturing firms.

## **Theoretical Background**

Waters (2006) observed that the traditional approaches to materials management uses planned operations where managers design a detailed schedule for each distinct activity within the chain. By coordinating these schedules, managers control the flow of materials. The problem with the traditional approach is that it is based on a paper system and even when firms move to automation, they often automate the same procedures. This has fundamental weaknesses of taking too long, being expensive, relying on paperwork, and physically moving paperwork between locations, having many people doing the administration, being unreliable, introducing errors, having more people supervising and controlling administration. These problems can be overcome when firms move electronic purchasing and hence adopting materials management approach.

Dobler and Burt (1996) postulates that materials management provides an integrated system approach to the coordination of materials activities and the total material costs. They view it as something that advocates assigning to a single operating department all major activities, which contribute to the cost of materials. The objective is to optimize performance of materials systems, as opposed to sub-optimizing the performance of individual operating units that are part of the material system. Chase et al. (2009) contend that the objective of materials management is to ensure that the right item is at the right place, at the right time and at a reasonable cost. The intention of having materials management system in place is for solving materials problems from a total company view point (optimize) by coordinating performance of the various materials flow. Fearon et al. (1989) suggested that the introduction of computers was a great boost to the adoption of materials management, as materials function has many common databases.

According to Chary (2008) material inventory is kept in operations for three reasons; transactions, precautions and speculation. While speculative inventory cannot be encouraged particularly in a developing countries, there is need for transaction or “regular” inventory due to the lack of perfect synchronization of inflow and outflow of material and for precautionary or “safety” inventory to provide cover of any inability to predict demand supply of material.

Thomas et al. (1989) indicated that formal materials management have the potential to yield significant constructions cost savings, yet small and medium-sized commercial contractors may not feel that a integrated materials management program is cost effective.

Ramakrishna (2005) identified that half of sales income in a firm is spent on materials. Suppose a firm is spending 50% of its volume on material and the profits are say 10% of sales volume. A 2% reduction in materials cost will boost the profits to 11% of sales or the profits will be increased by 10%. To achieve the increase in profit through sales efforts, a 10% increase in sales volumes will be necessary.

Barnes (2008) defined a supply network as the set of interconnected relationships between all the parties that supply inputs to, and receive outputs from an operation. The focus is on a holistic approach which means the entire chain from internal to external customers. The success of any supply network depends on its ability to satisfy the needs of the ultimate customer, the end consumer of its products and services. Therefore, the network as a whole needs to be designed and managed in a way that enables it to do so effectively and efficiently as possible. It is not just the firm's own operations that need to be managed strategically to meet customer needs, but all the elements of the supply chain, individually and collectively. A key facet of the supply network is the nature of relationship between purchaser and supplier.

Chase et al. (2009) explained the concept of supply chain brings in the total systems approach to managing the entire flow of information, materials and services from raw materials suppliers through factories and warehouses to the end customer. They further emphasize that companies that face diverse sourcing, production and distribution decisions need to weigh the costs associated with materials, transportation, production, warehousing and distribution to develop a comprehensive network designed to minimize costs. Chase et al. (2009) confirmed that a firm's success depends on how they manage supply chain. They indicate that it is important to monitor inventory at each stage because it ties up resources. The efficiency of the supply chain can be measured based on the size of inventory investment in the supply chain and that the inventory investment is measured relative to the total cost of the goods that are provided through the supply chain.

According to Chopra et al. (2007) the main drivers of supply chain performance are; facilities, inventory, transportation, information, sourcing and pricing. Information Technology plays a much more vital role among the drivers. Electronic data interchange (EDI) for example allows firm's to place instantaneous, paperless purchase orders with suppliers. EDI has allowed automated procurement since the 1980s, but its use is still growing quickly (Waters, 2006). Chopra et al. (2007) reported that EDI is not only efficient, but it decreases the time needed to get products to customers because transactions are faster and more accurate than when they are paper based. An organization that want to excel and guarantee its future, must design its systems with customer in mind. Levi et al. (2009) proposed that thinking in terms of customer value promotes a broader look at a company's offerings and its customers. It requires learning why customers purchase, continue to purchase, or defect from a firm. Supply chain management can impact the important customer value of price by significantly reducing costs (Levi et al., 2009). Customer value drives changes and improvements in the supply chain; some forced by customers and competitors and others undertaken to achieve competitiveness.

## Methodology

The study was carried out in Nairobi, Kenya where the population of interest consisted of large and medium manufacturing firms. The population was considered appropriate because of the level of activity and resource employed in materials. In determining the size of the firm, several different measures are used such as the number of employees in the firm (Kirkpatrick, 1994); capital employed (Sawyer, 1985); volume of sales turnover (Crossan, 2005) and level and type of technology used (Kukalis, 1991). Aosa (1992) combines sales turnover and number of employees to determine the size of a firm.

The study used the number of employees and the criterion was adopted due to the availability of a list of names of the firms constituting the population of the study and categorization obtained from Kenya Industrial Research and Development Institute (KIRDI, 1997) directory of manufacturing industries as follows:

**Table 1: Size of firms**

Size of class code	Number of employees
A	5-19
B	20-49
C	50-99
D	100-199
E	200-499
F	Over 500

Source: Kenya Directory of manufactures industries (1997).

Firms with employees between 50-99 and 100 -199 were considered as medium (Size class code C and D), whereas firms with employees over 200 are considered large. Ownership and type of product manufactured were also considered in constructing the sampling frame for the study. A population of 178 firms was within this category. The study adopted a descriptive sample survey design and stratified random sampling was used to select 55 firms on the basis of medium or large firms and whether local or foreign. Data was collected using a structured questionnaire consisting both closed-ended and open-ended questions. The analysis was conducted by means of descriptive statistics such as proportions, percentages; median and mean to summarize the data. Content analysis was applied in open ended questions for data that could not be quantified or with inexhaustive answers thereby assisting in extracting all the different factors (Mentzer and Cox, 1984; Wheelwright and Clarke, 1976).

## Results

Out of a total of 75 firms visited, 73% accepted to be interviewed with the respondents being the CEOs, purchasing managers, management accountants, materials managers and logistic managers. Data analysed contained 54.5% local firms, 18.2% foreign firms and 27.3% joint ownership. Further, 63.6% of the firms were from medium category and the rest from large firm's category. Further analysis showed that 32.7% of firms were listed in Nairobi stock exchange and the sample selected considered the populations existing in each category and accessibility of the relevant information required for the research.

**Table 2. Annual Turnover**

Levels of Annual turnover	Number	Percentage	Cumulative percentage
Upto Ksh 50 million	10	18.2	18.2
Ksh 51 million to Ksh 500 million	15	27.3	45.5
Ksh 501 million to Ksh 1 billion	14	25.5	71
Ksh 1.1 billion to Ksh 5 billion	9	16.3	87.3
Ksh 5.1 billion and above	7	12.7	100
Total	55	100	

Source: Research data

The result showed that 27.3% of the firms had an annual turnover of between Ksh 51 million to Ksh 500 million, followed by 25.5% of the firms with annual turnover of Ksh 501 to 1 billion, 18.2% had annual turnover of upto Ksh 50 million, 16.3% had Ksh 1.1 billion to 5 billion and lastly 12.7% had Ksh 5.1 billion and above.

**Table 3: Proportion of the annual turnover spend on material and materials related costs**

Proportion	Number	Percentage	Cumulative percent
0-20	0	0	0
21-40	9	16.4	16.4
41-60	21	38.2	54.6
61-80	25	45.4	100
81-100	0	0	100
Total	55	100	

Source: Research data

45.4% of the firms spent between 61-80% of annual turnover on materials and materials related costs, 38.2% of the firms spend between 41-60% while only 16.4% had expenditure of between 21% -40%.

**Table 4: Computation of annual turnover on materials and materials related costs**

Class interval	X (Mid -point)	Frequencies	X F
21-40	30	9	270
41-60	50	21	1050
61-80	70	25	1750
		$\sum f$ 55	$\sum xf$ 3070

Source: Research data

$$X = \frac{\sum xf}{\sum f} = \frac{3070}{55} = 55.8$$

Kenyan manufacturing firms were found to spend an average of 56% of their annual turnover on materials and materials related cost.

**Table 5: Company's Growth Position**

Growth stage	Number	Percentages	Cumulative percentage
Initial stage	0	0	0
Growing	27	49.1	49.1
Maturing	23	41.8	90.9
Declining	5	9.1	100
Total	55	100	

Source: Research data

The results indicate that 49.1% of the firms were in growing stages and 41.8% were on the maturing stages and 9.1% were on the declining stage with no firm in the initial stage. This enabled data analysis on the information provided by the firms concerning the structures existing or expected to exist.

Reporting and relations with other departments is an important function for effective and efficient running of the system. For example the executive to whom the purchasing manager reports to indicates of the status of purchasing and the degree to of emphasis within the organization.

**Table 6: The in-charge of materials function reports (to whom)**

Direct Report	Percentage
CEO	23
General manager	18
Financial controller	19
Management accountant	8
Operation/Production Manager	21
Logistics Manager	3
Others	100

Source: Research data

23% of the firms had an in-charge of materials reporting directly to the CEO indicating recognition of material functions based on its impact on the organizational cash flow. Some firms had the in-charge of materials reporting to the production or operations manager with reasons that most materials functions fell within their department.

For other firms, the financial controller or management accountant controlled the materials and functions suggesting that this helps them monitor the expenditures and cost controls. According to Bose (2007) organizational structure should be in line with the functions being performed and objectives to be achieved. The output of an undertaking depends on successful implementation of innumerable activities which follow the process of building an effective structure.

**Table 7: The existence of a specific department for materials functions, by organizations size (sales in Ksh.)**

	Up to Ksh. 50 million		Ksh. 51 million to 500 million		Ksh. 501 million to 1 billion		Ksh. 1.1 billion to 5 billion		Ksh. 5.1 billion and above		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
with specific department	3	30	6	40	8	57	5	56	5	71	27	49
without specific department	7	70	9	60	6	43	4	44	2	29	28	51
<b>Total</b>	10	100	15	100	14	100	9	100	7	100	55	100

Source: Research Data

Interestingly enough, 49% of the firms had specific departments that performed materials functions while 71% of the organizations with sales turnover of Ksh 5.1 billion and above had specific departments dealing with material functions. Activities performed were mainly;

purchasing, receiving materials, inventory control; materials and purchasing research; materials planning and control.

### Application of materials management concepts

Any firm with least three of the following functions practice the materials management concept; purchasing, inventory control, production scheduling and control, incoming quality control, warehousing and stores, materials and Technical stores.

**Table 8: Application of Material Management Concepts**

	up to Ksh 50 million		Ksh 51 million to 500 million		Ksh 501 million to 1 billion		Ksh 1.1 billion to 5 billion		Ksh 5.1 billion and above		<b>Total</b>	
	No	%	No	%	No	%	No	%	No	%	No	%
Organization does use materials management	6	60	8	53	9	64	6	67	6	68	35	64
Organization does not use materials management	4	40	7	47	5	36	3	33	1	14	20	36
<b>Total</b>	10	100	15	100	14	100	9	100	7	100	55	100

Source: Research data

The results indicate that 64% of the firms were using materials management concept. The titles given to the in-charge of materials functions were varying from one organization to another such as purchasing manager, logistics manager, general manager, supply chain manager, raw material manager, management accountant, operation manager, storekeeper, works manager and production manager. 40% of the firms had problems with the concept such as: it is bureaucratic; it entrust a lot of activities to one department and that it required a very efficient data system. Among the improvements to the materials management concept mentioned were; computerization of most departments so as to generate accurate and timely information, wastage analysis and cutting down of costs.

### Discussions

The study sought to determine the following: the level of emphasis Kenyan manufacturing firms were giving to materials management; the proportion of annual turnover firms spend on material and materials related cost; the firm's structures existing for materials management; the material management concepts adopted by Kenyan manufacturing firms and what benefits and challenges they have encountered.

The results show that Kenyan manufacturing firms spend an average of 56% of their annual sales turnover on materials and materials related cost. 23% of the firms had an individual in-charge of material functions reporting directly to the Chief Executive Officer (CEO) and the rest were reporting to other management position. Thus, the majority of the firms had not given due recognition to material functions. When the in-charge of material function reports directly to the CEO, is an indication that the position is recognized as a top management function indicating it is critical to the firm.

Generally factors which influence the level that material functions is placed in the organization structure covers a broad spectrum. Among the major ones are: the amount of purchased material and other related costs as a percentage of either total costs or total income of organization; the nature of the products or services acquired and the acquisition of complex components or extensive use of subcontracting represents difficult purchasing problems; Kenyan firms with international influence outsourcing some of their purchasing services; the conditions in the market place for those products and services of vital importance to the organization; the talent available for the assignment, an area where Kenyan firms have failed because very few professionals are trained in purchasing and supplies management and the challenges and opportunities present in the purchasing and supply area in relation to the firms objectives.

The study indicated that more large firms had departments dealing with most of their material functions as compared to medium firms and as the firm increases in size the more likely it recognizes the need for such departments. The need for such departments depended on the amount of materials used in a firm, computerization of the firm and the difficulty of sourcing materials.

64% of the firms were found to be applying materials management concept, though most were doing so unknowingly. Majority of the firms had material functions performed by general managers and production managers. The titles given to the person performing materials functions varied from one organization to another. The benefits expected in using materials management concept were; improvement in quality of inputs, reduction in conflict regarding material functions, quick response to demands, better co-ordination, optimal stock level, stable manufacturing schedules, effective and efficient information flow among others.

The problems encountered by the materials management concept were; lack of flexibility; entrusting sensitive activities with one office; lack of well integrated database system to support information flow and bureaucratic in nature. Subsequently, most Kenyan manufacturing firms have yet to recognize professionalism in materials management as most sensitive positions like purchasing and supplies are undertaken by non-professionals. This is a great undoing in this globally competitive market. Not all firms can adopt the materials management concept as it is most suited with large firms who have lot of resources employed in materials with a well managed database system. Otherwise small organization sees it a very expensive. With the tremendous improvements in information technology and communication, the increasing emphasis on the competitiveness has led to new attention on competitive advantage through effective utilization of firms resources. It is essential to address competitiveness through cost reduction; competitive buying; buying wisely; effective and reliable sources of supply; inventory investment and inventory costs at a practical minimum. The majority of the Kenyan manufacturing firms were not practicing professionalism in materials management which was found to be more suited for large firms. Lack of trained personnel in materials management locally has contributed to lack of recognition of the function. Owing to the huge resources companies spend on materials; much emphasis and attention should be given to materials management to enable firms achieve the best optimal cost structures and as such firms need to create departments dealing with materials function to enable easy control and monitoring costs.

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