



## Finance Management

Elixir Fin. Mgmt. 73 (2014) 25920-25924

Elixir  
ISSN: 2229-712X

# The role of materials management on organizational performance: A case of new Kenya cooperative creameries limited, Eldoret Kenya

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## ARTICLE INFO

### Article history:

Received: 27 March 2014;

Received in revised form:

20 July 2014;

Accepted: 29 July 2014;

### Keywords

Materials Management,  
Inventory Control Systems,  
Organizational Performance,  
Production Costs,  
Profitability.

## ABSTRACT

Materials management is a tool to optimize performance in meeting customer service requirements at the same time adding to profitability by minimizing costs and making the best use of available resources. The main objective of the study was to assess the role of materials management on organizational performance. Specifically, the study intended to assess how inventory control systems and lead time affect organizational performance. The empirical analysis of the study focused mainly on the New Kenya Cooperative Creameries, Eldoret, Kenya, being one of the largest and the oldest dairy company in East and Central Africa. The target population of the study was 56 employees of New KCC Ltd. Eldoret. A sample of 49 respondents was selected from this population using the stratified random sampling technique, where 7 departments, which directly deal with materials, were selected which include: production, Purchasing, quality Control, Warehouse/store, Human Resource Development, Finance and audit and physical Distribution departments. Data was collected through a structured questionnaire, consisting mainly of closed ended and open-ended questions. The data was analyzed through descriptive statistics such as mean, standard deviation, median and percentages. Results showed that there was significant increase in organizational performance as a result of inventory control system involvement. Further, results showed that lead time was highly significant to organizational performance through acquiring and delivering the needed materials within the shortest time possible. The study advocated that a lot of emphasis need to be directed to materials management in dairy companies in order to achieve significant cost savings, reduction in wastes and production costs and to achieve increase in profitability and product quality, consequently improving the organizational performance. The study recommended that dairy companies adopt the use of Information Communication Technology (ICT), use of proper codes in all materials, and the employees be trained on the use of inventory control systems.

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## Introduction

In the earlier years, materials management was treated as a cost centre since purchasing department was spending money on materials, while store was holding huge inventory of materials, blocking money and space (Ramakrishna, 2005). However, with the process of liberalization and opening up of global economy, there has been a drastic change in the business environment, resulting in manufacturing organizations exposed to intense competition in marketplace. In Kenya for instance, materials constitute a major cost component for any industry. Sturkhart (2007), states that the total cost of installed materials or value of materials may be 60% or more. In many cases, the cost of materials exceeds 50% of the total cost of goods produced. Such a large investment requires considerable planning and control so as to minimize wastage which invariably affects the performance of the organization (Ramakrishna, 2005).

Majority of the companies attain significant savings from effective materials management, which amounts between 50%-60% of total costs (Song *et al.*, 2006). Effective management of materials can lead to a reduction in cost, resulting in a significant saving. A potential 6% saving on total cost through effective material management is achievable (Bell & Sturkhart, 1987),

The various types of materials to be managed in any organization include purchased materials, work-in-progress (WIP), materials and finished goods (Banjoko, 2009). Ogbadu (2009), identified basic price, purchasing cost, marketing cost, obsolescence and wastages as the various costs involved in these materials. Thus, the management of these materials so as to reduce the costs associated is what it is referred to as material management. Previous researches (Whyback & William, 1986; Evanet *et al.*, 1987; Ramakrishna, 2005; Ogbadu, 2009; Ondiek, 2009) have shown that materials account for more than 50% percent of the annual turnover in manufacturing firms. This shows clearly that priority should be given to management of materials in organizations to avoid unnecessary costs.

Kenyan production and manufacturing firms, and specifically businesses in the dairy sector are facing competition in the current markets which has led to the need for coming up with better ways and strategies of managing material resources hence eliminating wastage in the value chain and thus enhancing organizational performance. Kenya Cooperative Creameries was mismanaged until it collapsed in the 1990s.

According to a survey carried out by Mutwol (2013), on the impact of the collapse of KCC, it was found that the sector have

suffered so much over the past years due to lack of adequate commitment to timely funding of materials procurement, poor material planning, poor inventory control, purchasing problems, quality control problems; stores control problems, material movement and even surplus disposal problems. Therefore, this study became inevitable in view of the developing and changing nature of the Kenyan economy given the nature of the environment: Economic, Political, changes in technological environment, government regulations, multiple taxation, environmental degradation and reduction in quality of raw materials as a result of re-cycling and stiffer competition. Thus materials management should no longer be viewed as a drain-pipe, but as a serious stabilizing and economic growth potential factor. Unfortunately, few studies exist yet on the role of Materials Management on Organizational Performance and therefore the study attempts to fill this knowledge gap.

### Literature Review

Theoretical Background Barker (1989), identified five key functional areas that materials management cuts across which include purchasing, production and inventory control, quality control, storage and warehousing and physical distribution. Other literatures (Donald, 1975; Why bark & William, 1986; Linton *et al.*, 2007) expanded the areas to include forecasting demand and quantity materials requirements, good supplier and customer relationship, indigenous source of supply for foreign materials, developing skills of workers in material management, improved departmental efficiency and research and development (R&D) in material management. These activities are managed by the material management department. Selection of personnel for marketing, purchasing, inventory control, stores management and materials handling and their training and placement is also to be seen by the materials management department.

Materials are the lifeblood and heart of any manufacturing system and no organization can operate without them. They must be made available at the right price, at the right quantity, in the right quality in the right place and at the right time in order to co-ordinate and schedule the production activity in an integrative way for an industrial undertaking. A manufacturing firm will remain shaky if materials are under stocked, overstocked, or in any way poorly managed (Banjoko, 2000).

According to Navon & Berkovich (2006), the main logistic responsibility in any organization is to formulate master programme for the timely provision of materials, components and work-in-progress. Stevenson (2001), explained that logistics, including materials and goods flowing in and out of a production facility as well as its internal handling has become very important to an organization to acquire competitive advantages, as the company's struggle to deliver the right product at the correct place and time. The main aim is to actually promote, with low cost, a flow whose velocity allows the execution of manufacturing process with expected satisfaction level.

Bowersox & Closs (2002), articulated that improvement in continuity of supplies with reduced lead times, will lead to improvement in cooperation and will also enhance cooperation's and communications with reduced duplication of efforts, reduction in material costs and improvement in quality control, which are the main benefits of materials management

### Concept of Materials Management

Materials Management is a tool to optimize performance in meeting customer service requirements at the same time adding to profitability by minimizing costs and making the best use of available resources. The basic objective of Materials Management as explained by Banjoko (2000) and Jacobs *et*

*al.* (2009), is to ensure that the right item is bought and made available to the manufacturing operations at the right time, at the right place and at the lowest possible cost.

According to Wild (1995), materials management is a concept which brings together the responsibility for determining the manufacturing requirement that is scheduling the manufacturing processes and procuring, storing and dispensing materials (Wild, 1995; Ondiek, 2009). An integrated approach to material management defines it as the function responsible for the coordination of planning, sourcing, purchasing, moving, storing and controlling materials in an optimum manner so as to provide a predetermined service to the customer at a minimum cost (Ramakrishna, 2005; Gopalakrishna & Sundaresan, 2006). These definitions provide the scope of materials management which includes materials requirements planning (MRP), decision on purchasing, procurement of materials, inventory management, staffing, stores and warehouse management, production and distribution of finished goods at minimum cost at due time (Osotimehin, 2006; Monday 2008; Ogbadu, 2009).

Chase *et al.* (2009), explained the concept of materials management 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 user/customer. The study further confirmed that a firm's success depends on how they manage their materials effectively. They indicate that it is important to monitor inventory at each stage because it ties up resources. Therefore, effective materials management is fundamental to the survival of business, industry and economy.

### Methodology

The study relied on primary data, collected through structured questionnaire from a case study of New KCC Ltd. Eldoret. A Case study approach was adopted since it successfully enhances the understanding of complex issues and can further anchor what has been previously known, while overemphasizing detailed contextual analyses of limited conditions and their relationships (Dooley, 2002).

The New KCC is an integral part of the Kenyan Manufacturing sector with an outstanding reputation as the largest dairy company in Africa and the oldest in East and Central Africa, having been founded in 1925 by European farmers. The company sells fresh milk products and its products are used by the whole family for meals, snacks and calcium-filled drinks. The products range is targeted at market segments across the board, from the upper and middle to the lower income markets. New KCC has also developed export channels for its products especially in the East African Community (EAC) and Common Market for Eastern and Southern Africa (COMESA). Over the years, its production capacity has grown and it presently has 9 creameries, over 9 cooling and collection centres and 6 sales depots. New KCC's vision is to be the preferred dairy of international standing, providing high quality products. New KCC's focus has always been on quality. Consumers have become more health conscious and more educated about what they consume, which has led to the introduction of low fat and standard milk variants. New KCC strives to make its brands more attractive through packaging designs and convenience. It has various small stock keeping units (SKUs) for each brand to give consumers a choice to suit each pocket. The company's distribution system ensures that its products are available in small shops all over the country.

The study employed stratified random sampling technique and Production, Purchasing, quality Control, Warehouse/store, Human Resource Development, Finance and audit and physical

Distribution departments were selected since they deal directly with materials. The population of these 7 departments was 56. The sample size was determined using Yamane (1967) Formula:

$$n = \frac{N}{1 + N \cdot e^2}$$

Where N is the Population size, n is the Sample size and e is the Level of precision. Applying 5% error margin, the sample size for the study was 49 members of staff.

The study employed descriptive and inferential statistics to show the relationship between inventory control systems and lead time on organizational performance in the company. The descriptive statistics include percentages, mean and standard deviation, while inferential statistics was correlation analysis.

### Results and Discussions

Out of a total of fifty six (56) copies of the questionnaire that were administered to the staff of the materials related departments as stipulated in the methodology, 49 copies were correctly filled and returned resulting in a high response rate of 88%. The analysis of this study was based on the retrieved copies of the questionnaire.

#### Inventory Control System- Degree of Involvement

The study sought to assess the following: the degree of involvement of different inventory control systems; the effects of inventory control systems on organizational performance and effects of lead time on organizational performance. Inventory control systems are the most important function of materials management and it forms the nerve centre in any organization (Ramakrishna, 2005). An inventory control system is a system that encompasses all aspects of managing a company's inventories; purchasing, shipping, receiving, tracking, warehousing and storage, turnover, and reordering. Using that definition, the respondents were required to respond to the statements as it implied to the organization.

The respondents were to assess the degree of involvement in inventory control systems on a likert scale of very high involvement, high involvement, indifferent, low involvement and very low involvement. Based on the interview, the company operates Just-In-Time, Lot-for-Lot, Buffer Stock, Material Requirement Planning(MRP), Electronic Data Interchange (EDI), Enterprise Resource Planning (ERP), ABC Analysis and Intelligence Resource Planning as shown in Table 1.

The analysis of the study showed that there was high involvement of JIT in materials management (1.65) and ERP (1.91). Mean responses also showed that there was high involvement of MRP (2.16), IRP (2.06), EDI (2.30) and Lot for Lot (2.39). The degree of involvement of inventory control systems on organizational performance with means lower than 2.5 implies that the respondents highly involve inventory control systems in their organization. This trend is in agreement with those found in the literature. Further, and by a way of average, the research findings showed that inventory control system ratings were a strong tool to support organizational performance. To boost the performance of organizations, there is need for inventory control systems. Inventory control systems with the highest standard deviation were: ABC Analysis (1.38), Buffer Stock (1.29) and Electronic Data Interchange (1.21). All these responses showed that they were far from the mean thus implying that there was low involvement of these systems in the organization. However, the responses with low standard deviation included Just-In-Time (0.87), Intelligence Resource Planning (1.07) and Enterprise Resource Planning (ERP) (1.09). These responses were close to the mean, implying that the responses were not varied hence these inventory control system were highly involved in the organization.

### Effects of Inventory Control System on Organizational Performance

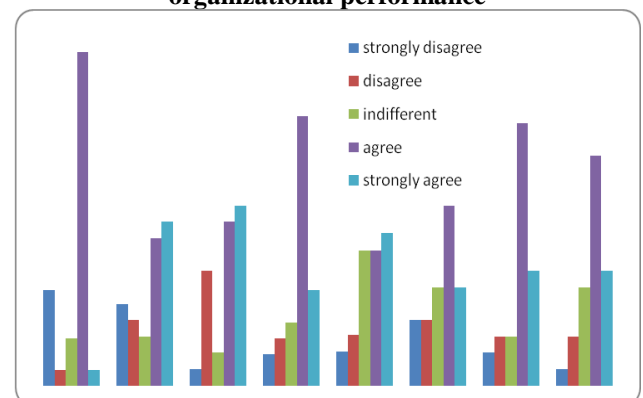
Inventory control system can also have a profound effect on organizational performance. From the findings, the results showed that the mean average of the Likert Scale 1-5 used, 1 being strongly disagree and 5 being strongly agree, the respondents pointed out that inventory control systems were an important factor of organizational performance.

From the descriptive statistics performed, mean responses with the highest effects included: increased product quality, decreased production cycle times and system flexibility (3.74), timely deliveries (3.69) and increased profitability (3.63). The effects of inventory control system with means higher than 3.5 implies that the respondents "Agree" that inventory control systems will lead to a high organizational performance. This trend is in agreement with those found in the available literature. Majority of the respondents admitted that inventory control systems are a highly significant factor to the organizational performance at New KCC Ltd. Eldoret.

Further, responses with means of approximately 3 meant that the respondents were "indifferent" of the said effects. These included: Reduction of wastes (3.31), reduced stock levels (3.35), and reduction of production costs (3.48). This can be attributed partly to the challenges facing materials management and to the lack of appropriate inventory control systems in the organization. The highest standard deviation was reduction in production costs (1.48), Reduced stock levels (1.31), Increased product quality (1.26) and Reduction in wastes (1.23) implying that these responses were far away from the mean hence not significant. The lowest standard deviation was from system flexibility (1.03) and Timely deliveries (1.09) implying that the responses were close to the mean hence was regarded significant because the respondents were in agreement with those effects.

This can further be elaborated in Figure 1:

**Figure 1: Inventory Control systems- Effects on organizational performance**



From the Figure 1, the analysis further showed that majority of the respondents agreed that inventory control systems can lead to a reduction of waste (65.6%), timely deliveries (53.1), decreased production cycle times (51.6), which in turn affects the organizational performance.

Further, the results showed that the coefficient correlation between inventory control systems and organizational performance is 0.884. This meant that there was a strong positive relationship between inventory control systems and organizational performance of New KCC Ltd. Eldoret hence has contributed to the growth and performance of the company.

### Effects of Lead Time on Organizational Performance

Lead time is an important activity in effective materials management aimed at obtaining timely provision of materials,

components and work-in progress. The main purpose of lead time is to actually enable the organization to acquire competitive advantages while delivering the right product at the correct place and at the right time hence satisfying the ultimate customer (Stevenson, 2001).

From the descriptive statistics performed using the data collected relating to the effects of lead time of raw materials on organizational performance, the effects with the highest means included: customer satisfaction (4.03), shorter production schedules (3.83) and reduced obsolescence and surplus (3.67). These responses had means above 3.5 implying that the respondents “Agreed” with those propositions. Further, the results showed that the correlation coefficient between lead time and organizational performance is 0.451. Hence it can be deduced that there was a positive relationship between lead time and organizational performance.

Bowersox&Closs (2002), articulated that improvement in continuity of supplies with reduced lead times, will lead to improvement in cooperation and will also enhance cooperation’s and communications with reduced duplication of efforts, reduction in material costs and improvement in quality control, which are the main benefits of materials management.

### Conclusion

The objective of the study was geared to provide useful insight to the future prospects of the Kenyan dairy companies if at all materials management is given priority as a total concept. The study established that there was a positive and significant relationship between inventory control system and lead time on organizational performance. This implies that through inventory control systems and lead time in materials management, an organization can achieve the benefits of effective use of labour, providing system flexibility, increasing productivity, decreasing lead times, reduction in wastes, reduction in production costs, increased product quality are achieved. The ratings showed that inventory control systems played a vital role in organizational performance, and as such, organizations must ensure that inventory control system be highly involved in material management activities hence achieving higher organizational performance. The results also showed that the coefficient correlation between inventory control systems and organizational performance is 0.884. This meant that there was a strong positive relationship between inventory control systems

and organizational performance of New KCC Ltd. Eldoret hence has contributed to the growth and performance of the company. It was also evident from the findings of the study that lead time contributes to organizational performance. Lead time showed how the organization acquires competitive advantages as it delivers the right product at the correct place and within the shortest time possible. Further, the results showed that the correlation coefficient between lead time and organizational performance is 0.451. Hence it can be deduced that there was a positive relationship between lead time and organizational performance. More significantly was the fact that there was a strong positive correlation between lead time and inventory control systems of 0.940, hence it can be deduced that there was a strong positive relationship between inventory control systems and lead time on organizational performance.

### Recommendation

Based on the findings, it is inevitable to provide recommendations to the management of New KCC Ltd. Eldoret, and other dairy companies on how to boost Materials Management in Kenyan Dairy Companies.

The study recommends that there is need to enormously employ inventory control systems and information and communication technology especially in MRP so as to excel and guarantee its future, hence improving organizational performance. Further, the study recommends that the Dairy Companies in Kenya should increase their resource commitment to staff training and Research and Development in materials management so as to develop the necessary skills, update their knowledge, and enhance New Product Development.

Finally, the study recommends that there is need for organizations to adopt the use of information technology, that will not only help in information sharing, but also will help in hastening orders from suppliers hence shortening the lead time. Further, the study recommends that the organization form an expediting committee that will help in following up of orders with the suppliers hence delivering the products at the right time. Materials Management Department therefore should to support the management of an organization in the production activities. It should help in marketing, selling, promotion and even control of all types of materials for its quantity, quality and cost.

**Table 1: Inventory Control System- Degree of Involvement**

Degree of Involvement	N	Mean	Std. Deviation
Just-In-Time	49	1.65	.87
Lot-for-Lot	49	2.39	1.11
Buffer Stock	49	2.50	1.29
Material Requirement Planning(MRP)	49	2.16	1.15
Electronic Data Interchange (EDI)	49	2.30	1.21
Enterprise Resource Planning (ERP)	49	1.91	1.09
ABC Analysis	49	2.63	1.38
Intelligence Resource Planning	49	2.06	1.07

**Table 2: Effects of Inventory Control Systems on Organizational Performance**

Effect	N	Mean	Std. Deviation
Reduction in wastes	49	3.31	1.23
Reduction in production costs	49	3.48	1.48
Increased product quality	49	3.74	1.26
Timely deliveries	49	3.69	1.09
Increased profitability	49	3.63	1.22
Reduced stock levels	49	3.35	1.31
Decreased production cycle times	49	3.74	1.12
System flexibility	49	3.74	1.03

**Table 3: Effects of Lead Time on Organizational Performance**

Effect	N	Mean	Std. Deviation
Reduction in inventories	49	3.26	1.34
Shorter production cycle times	49	3.83	1.34
Reduced obsolescence and surplus	49	3.67	0.99
Reduction in materials cost	49	3.42	1.41
Improvement in product quality	49	3.47	1.36
Increased sales	49	3.37	1.35
Increased profitability	49	3.45	1.23
Increased customer satisfaction	49	4.03	1.08

**Table 4: Correlation Analysis of the Variables Studied**

		Inventory control system	Lead time	Organizational level of performance
Inventory control system	Pearson Correlation	1	.940*	.884*
	Sig. (2-tailed)		.000	.000
	N	49	49	49
Lead time	Pearson Correlation	.940*	1	.451
	Sig. (2-tailed)	.000		.782
	N	49	49	49
Organizational level of performance	Pearson Correlation	.884*	.451	1
	Sig. (2-tailed)	.000	.782	
	N	49	49	49
*. Correlation is significant at the 0.05 level(2-tailed).				

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