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MATERIALS MANAGEMENT AND ITS EFFECT ON COST OF SUPPLIES
CASE STUDY OF
COCOA PROCESSING COMPANY OF GHANA



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PREFACE

First and foremost, the authors' will like to express their thanks to our supervisor Sigvard Herber for his support and guidelines throughout this research work.

Our other thanks go to all friends and loved ones, who helped to make this work possible. Finally, the authors' will like to thank the respondents and the management of Cocoa processing Company of Ghana for their support.

ABSTRACT

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Title: Materials Management and its Effect on Cost of Supplies

Background: In most organizations within the country (Ghana), materials management has been relegated to the background without any proper control. This means that companies are investing heavily in materials than is necessary.

Problem: How can materials management minimize the cost of supplies in Cocoa Processing Company of Ghana?

Purpose: The aim of this research is to illustrate how the application of materials management concept can minimize the cost of supplies in Cocoa Processing Company of Ghana.

Methods: With regards to primary data, interviews (face-to-face, telephone) and questionnaire were used. Secondary data has been sourced through literature from the university library and internet sources, qualitative design method was chosen over others because of the nature of the research work.

Conclusion: Financially, materials (inventories) are very important to manufacturing companies and on the balance sheet they usually represent from twenty to sixty percent of total assets. Therefore, if the application of the concept of materials management is accepted with well qualified personnel, it could lead to the minimization of cost. The function of a materials manager is to promote coordination and integration within the supply chain and the major benefits are assumed to be; reduction in interdepartmental conflicts, reduction of inventory levels, increased knowledge of total corporate operations and reduction of materials handling costs among others.

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1. INTRODUCTION

1.1 Introduction

In this chapter, the authors will introduce the chosen topic as well as the statement of the problem, the problem discussion, aim, scope of the research, target group; the research approach and the company background will be presented.

A close “analogy” exists between materials management and marketing. With the later, the aim is to co-ordinate effectively a number of related activities, i.e. market research, product research, sales analysis, forecasting, promotion and selling, under one executive, Lysons (1992:35).

According to Lysons (1992:36-37), materials management “is a management process which integrates the flow of supplies through in and out of an organisation to achieve a level of service which ensures that the right materials are available at the right place, at the right time, of the right quantity and quality and at the right cost. It includes the functions of procurement, materials handling and storage, production and inventory control, packaging, transport, associated information systems and their application throughout the supply chain, manufacturing, and service and distribution sectors within the organization”.

Materials management is essential to all manufacturing firms because time and economic delivery is necessary to maintain efficient continuous production. The cost of supplies, that is raw materials and purchase parts, partially completed goods, (work-in-process), finished goods, inventories (manufacturing firms), constitute the highest single expenditure of firms engaged in basic manufacturing or production, Dobler et al (1996:8).

Therefore, extreme care is required to ensure that the materials and parts purchased meet quality specification at the lowest possible total cost of procurement, Jones et al (2004:95). The fundamental objective is to provide the correct assortment of materials and parts at the desired location when needed and in an economic manner, Carter et al (1993:23).

According to Arnold (1998:221), further argued that, financially, materials (inventories) are very important to manufacturing companies and on the balance sheet for example, they usually represent from 20 percent to 60 percent of total assets. Therefore improvement in materials management throughout the supply chain with well qualified personnel will enhance cost effectiveness in the organisation, Zenz (1994:15), Also, Stevenson (2006:484), argued that, a typical manufacturing firm probably has about thirty percent of its current assets and perhaps as much as ninety percent of its working capital invested in inventory.

In this sense, materials management have a very great role to play in the profitability of the organisation either public or private. However, it is rather unfortunate that many organisations do not attached importance to the department.

1.2 History of cocoa production in Ghana

Cocoa is Ghana's most important agricultural export crop, which normally accounts for 30-40 percent of total exports. Most cocoa is produced by 1.6 million small farmers on plots of less than three hectares in the forest areas of the Ashanti, Brong-Ahafo, Central, Eastern, Western, and Volta regions. In the 1960s Ghana was the world's largest producer of cocoa but it has since been overtaken by neighboring Côte d'Ivoire, (Nations encyclopedia webpage).

Cocoa is indeed Ghana; Cocoa first arrived in Ghana in the early years of the nineteenth century. History has it that cocoa was first brought to Ghana by the Dutch missionaries but it was not until Tetteh Quarshie, a native of Osu in Accra, who had traveled to Fernando Po and worked there as a blacksmith, returned with Amelonado cocoa pods in 1879 that it began to spread. Currently, there are six cocoa growing areas namely: Ashanti, Brong Ahafo, Eastern, Volta, Central and Western regions.

Although, fruits mature throughout the year, usually there are two harvests periods in a year. The crop year begins in October, while the light crop season starts in June. Harvesting cocoa consists of cutting the ripe pods from trees, breaking them open and extracting the seeds from the pods. These seeds are then allowed to ferment for six or seven days with two turnings before drying in the sun. Beans are then bagged and shipped.

In recognition of the contribution of cocoa to the development of Ghana, the government in 1947 established the Ghana Cocoa Board (COCOBOD), as the main government agency responsible for the development of the industry (MOFEP webpage).

According to Francois Ruf, a researcher for the French CIRAD tropical agriculture Institute, the supply of cocoa seems very dependent on the clearance of tropical forests and seems to change within countries and continents. Cocoa farmers slash and burn forest themselves or move on to land which has been commercially logged, (American edu.webpage).

But at the urging of the World Bank and other aid donors, Ghana's government has carried out major reforms in the cocoa sector, improving efficiency and channeling more money to farmers. At the same time, world market prices have recovered from historic lows. (Cgi.cnn.com webpage)

1.2.1 The background of the company

Cocoa Processing Company (CPC) of Ghana was constructed between 1963 and 1972 for the processing of raw cocoa beans and for the manufacturing of chocolate and confectionary products in Ghana. The company brands of chocolate, which are distinguished by the trade mark golden tree, are as follows:

- Portem Nut
- Akuaffo Bar
- Oranko

It also includes, Instant drinking chocolate like All-Time, Vita co and pebbles among others

The company purchases its raw materials from the Produce Buying Company which is one of the subsidiaries of the Ghana Cocoa Board, which also purchases the cocoa beans from farmers within the country and resells them to Cocoa Processing Company at export rate to produce their products.

1.3 Problem discussion

Most organizations especially in manufacturing and in production does not have materials management department. Management in those organizations are of the view that any department within could be a materials or purchasing manager. They assume that, it is a matter of making sure materials comes into the organization and are issued to production as and when it's needed. Cocoa Processing Company of Ghana is therefore of no exception. But, according to Zenz (1996:14), 'the materials management concept, which incorporates all functions involved in obtaining and bringing materials into the plant, is now being viewed as the answer to many coordination and control problems'.

Since there is an absence of materials management concept in these organizations, the departments that are in charge of materials handling report directly to accounts department. According to Carter et al (1993:271), "the materials management concept has often been neglected when it comes to involvement in forward planning discussions and meetings, and many companies have found to their cost the error of leaving out a major part of the organization so directly involved with operations".

Zenz (1996:15-16), explained that, management expect to find purchasing and materials personnel who have the expertise necessary to organize and administer all the activities involved in the materials management functions. He went on to state that but some may lack the in-depth knowledge of specific techniques, particularly in areas of inventory and production control". According to Carter et al (1996:28) "many organizations training is not seen in its invested light, rather as another cost which reduces profits ". The training must therefore be seen as investments in terms of time, money and energy on the part of the organizational and its management. Carter et al (1996:28) further explained that, this harmful mind-set is very common in relation to a material which is an indication of neglect by managers of materials as an important factor of the total operations.

1.4 Statement of the research problem

In most organizations within the country (Ghana), materials management has been relegated to the background without any proper control. This means that companies are investing heavily in materials than they need to. The research question is how can materials management minimize the cost of supplies in Cocoa Processing Company of Ghana?

1.5 Aim of the research work

The aim of this research is to illustrate how the application of materials management concept can minimize the cost of supplies in Cocoa Processing Company of Ghana.

1.6 Limitation of the research

This research is limited to the concept of materials management, and one company, (Cocoa Processing Company of Ghana) has been used for the study.

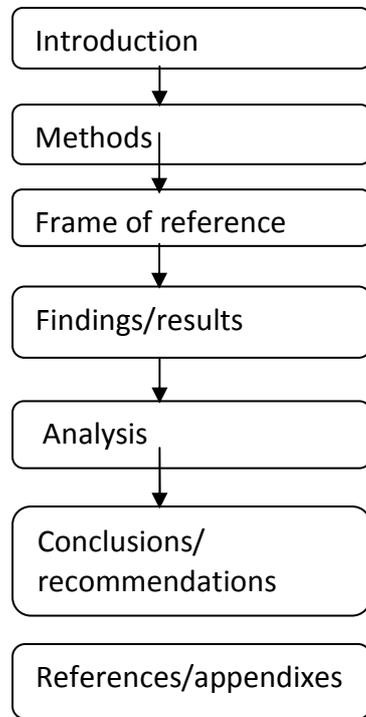
1.7 Target group

This research is targeted at the Management of Cocoa Processing Company of Ghana, as a suggestion towards the implementation of materials management concept, in order to minimize the cost of supplies.

1.8 Research approach

Our research is going to be structured as seen in the diagram below. Our work would be divided into seven chapters. The second chapter presents the research method; the third chapter covers the frame of reference. The fourth chapter depicts our Findings/results. The fifth covers the analysis. The sixth chapter will include the conclusions and recommendations, and the seventh contains the list of references and appendixes.

Figure 1. Work Process



Source: (Own design)

2. METHODS

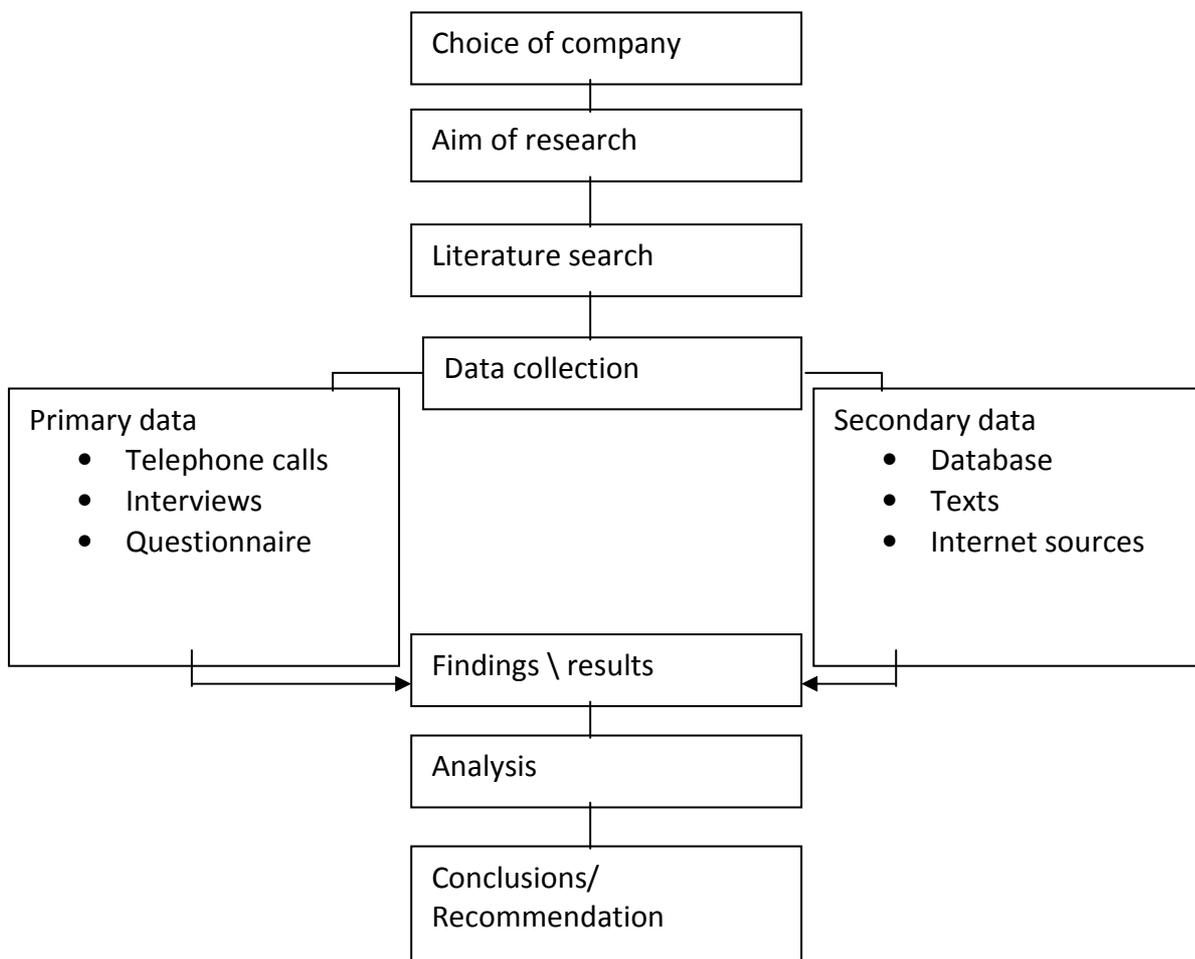
2.1 Introduction

In this chapter, the process of the research will be described. The choice of company and the aim of the research will be discussed. The choice of the method used will also be justified.

The design of the study and the methods of data collection will be clearly described. The criticism to the method will also be shown, illustrating the advantages and disadvantages of the methods used.

The test of the chosen methods in the area of validity, and reliability will also be discussed in order to justify the approach taken. The diagram below will further illustrate it.

Figure 2. Research Method (own diagram)



Source: (own diagram)

2.1.1 Research strategy

Research strategy, according to Yin (2003:13), “is an empirical inquiry that investigates a contemporary phenomenon within its real life context especially when the boundaries between phenomenon and concept are not clearly evident”.

The authors' have chosen to make a single case study on a particular phenomenon in an organization. Yin (2003:1-7), further explained that, a case study as a research strategy is used in many situations to contribute to the knowledge of an individual, group, organizational, social, political, and related phenomena. Case studies are one of several ways of doing social science research; other ways include experiments, surveys, histories and the analysis of archival information.

He again argued that, the first and most important strategy for differentiating among the various research strategies is to identify the type of research question being asked and suggest that in general “how and why” questions are likely to favor the use of case studies, experiments or histories. However, the case study is preferred in examining contemporary events but when the relevant behaviors cannot be manipulated.

Our research strategy starts with the choice of the research topic and the aim of the research. Next is the method used for data collection and the type of data collected (primary and secondary; qualitative and quantitative data), is described. Relevant literature which forms the basis, motivation and the foundation of this research will be discuss in relation to the method used in collecting empirical data from the organization.

Based on the findings of the primary and the secondary data obtained, the authors would proceed to make our analysis and conclusions in support of the theory used. The last step will be our recommendations based on the research.

2.1.2 Qualitative and Quantitative research

Qualitative research is a research strategy that usually emphasizes words rather than quantification in the collection and analysis of data. It is inductive, constructionist and interpretive (Bryman 2004:266).

It is based on methods of analysis and explanation building which involve understanding of complexity, detail and context. It is also aims to produce rounded understandings on the basis of rich, contextual and detailed data. There is more emphasis on ‘holistic’ forms of analysis and explanation, in this sense, than on charting surface patterns, trends and correlations (Mason 1996:5).

Mason (1996:5-6), pointed out that, qualitative research has the following characteristics:

- Qualitative research should be systematically and rigorously conducted
- Qualitative research should involve critical self-scrutiny
- The research should produce social explanation which are general in some way or which have wider resonance.
- The research should produce social explanation to intellectual puzzles.

On the other hand, quantitative research is a distinctive research strategy. In very broad terms, it is described as entailing the collection of numerical data as exhibiting a view of the relationship between theory and research as deductive, a predilection for a natural science approach (and of positivism in particular) and as having an objectivist conception of social reality. This research can be characterized as linear series of steps moving from theory to conclusions, and its measurement process entails the search for indicators, Bryman (2004:62-81).

Due to the aim of this research work, that is, materials management and its effects on cost of supplies, a qualitative design method was chosen in order to achieve the desired results for this research. The authors chose this approach since it will enable them look into all areas of the topic at hand and also give a thorough understanding and analysis.

2.4 Choice of company

The authors were motivated to write this research work on Cocoa Processing Company of Ghana as a result of the company being one of the subsidiaries of Ghana Cocoa Board and the sole company in the processing of raw Cocoa beans for the manufacturing of Chocolate and Confectionary products in Ghana. However, after a careful initial search, the authors found out that the company does not have a materials management department in spite of earlier studies which shows that a typical manufacturing firm has about thirty percent of its current assets and as much as ninety percent of its working capital invested in inventory. This discovery led the authors to carry out this research in order to illustrate to the company ‘How materials management can minimize the cost of supplies’.

2.5 Data collection

According to Saunders et al (2007:322), “there are two main approaches to data collection, namely, primary and the secondary data”. He further explained that, primary data is collected basically when a particular purpose arises while secondary data are already collected data which has been published and for which new researchers can rely on as a source of information.

2.5.1 Primary data

Burns (2000: 485) argued that, primary data are firsthand information gotten for a research. This could be in the form of an interview, records written and kept by people involved in, or who bear witness to an event. A conversational strategy can be adopted within an interview guide approach or combination of a guide approach with a standardized format by specifying certain key questions exactly as they must be asked while leaving other items as topics to be explored at the interviewer’s discretion, Patton (2002:347).

The rationale for collecting primary data for this research work is to have an in dept knowledge of the activities within the Cocoa Processing Company of Ghana and how it conforms to materials management and its effects on cost of supplies. According to Yin (2003:83) “evidence from case studies can come from six sources, namely documents, archival records, interviews, direct observations, participant observations and physical artifacts”. The authors however, used the following in collecting primary data i.e. (Telephone and Personal interviews and Questionnaire).

2.5.1.1 Face-to face Interview

In qualitative interviewing, there is much greater interest in the interviewee's point of view but in quantitative research, the interview reflects the researcher's concerns. Qualitative interviewing tends to be flexible, responding to the direction in which interviewees take the interview and perhaps adjusting the emphases in the research as a result of significant issues that emerge in the course of interviews Bryman (2004:319-320). Furthermore, Saunders et al (2007:310) pointed out that structured interviews use questionnaire based on predetermined set of questions. Semi-structured interview is where the researcher has a list of themes to be covered while the unstructured are informal.

In line with the above stated one of the researchers was in Ghana and conducted a face to face interview with the human resource and quality assurance managers of the company (Mr. Peter Kwadwo Sintim and Mr. Nathaniel Owusu Quao) on 8th and 10th January 2008 respectively, in the premises of the company on two different occasions which can be regarded as a structured interview. This was made possible because the authors had prepared questions a forehand. The aim of the interview was to obtain from the managerial perspective, firsthand information on how the company deals with its materials.

2.5.1.2 Telephone interview

A telephone interview was conducted from the Mälardalen University campus, Vasteras Sweden on 15th, 16th, 23rd, 25th January 2008 with procurement officer (Mr. A Lamptey), chief accountant (Mr. Timothy Godfrey Essandoh), marketing manageress (Mrs. Genevieve Dahlia Pawar) and security officer respectively. These were unstructured questions which had already been prepared by the authors that made it easier for the interviewer to follow. The purpose of the interview was to get a clear picture on how the company deals with issues concerning the management of materials and to get a clarification to certain questions which the respondents could not respond to in the questionnaire.

2.5.1.3 Questionnaire

As a major source of obtaining data, a set of clear questions were designed to reflect the problems and objectives of the research. The questions consisted of close-ended and open-ended as well as multiple choices to make it easier for respondent who could not follow a particular sequence of answers to make easy analysis of questions posed.

As part of the primary data, the authors handed out a questionnaire to fourteen workers from the marketing, accounting and purchasing departments of the company within two working days. The aim was to get an insight into their views, side by side to what the managers have said earlier on.

However, the disadvantage is that, a large number of employees within the organization were not considered because; the authors aim is not to make a generalization on population but to make an analytical generalization. Refer to the appendix for the attached questionnaire.

2.6 Secondary data

Secondary data is mainly from already existing information's made up of publications such as books, journals, articles, the internet sources and many other already established facts.

According to Saunders et al (2003:201-202), the advantages of using this source of data is to that resource are saved, in particular, time and money. Secondly, the researcher is able to analyse far and larger data sets. More so, one has the opportunity to think about theoretical aspirations and substantiate issues as there is more time to analyse and interpret data.

According to Saunders et al (2007:74), a literature search "is a systematic search of one or more databases for material on a specific subject". It gives the researcher an insight to see clearly how the research at hand relates to previous researches. The main sources of journals and articles which were in consistent with the topic were from Mälardalen University online databases. Google scholar database was also contacted to give the authors broader access to scholarly literature on the topic. In search for journals and articles, the search words used were Materials, Materials management, inventory management, Sourcing, Purchasing etc. were used to give precise information.

Secondary data was collected through official records, books or even electronically stored materials, articles from subject-related journals, databases and from Company's own webpage.

2.7 Reliability

Burns (2000: 417) argued that, reliability is based on two assumptions. The first is that the study can be repeated. This means that other researchers should be able to follow the steps of the original research, using the same categories of the study, the same procedures, the same criteria of correctness and the same perspectives. However due to the nature of ethnographic research that is how it is usually conducted, it is said to be vulnerable to replication difficulties.

The second assumption is that two or more people should be able to have the same results by using these categories and procedures. However, in ethnographic research this is difficult to achieve since mostly in this case the flow of information is dependent on social role held within the group studied and deemed appropriate.

Because of the authors' desire for a reliable research work, much scrutiny was done to obtain the right materials and information which the authors think are reliable and valid. Data was collected from a number of scientific researchers in support of the frame of reference. The interviews and questionnaire collected from the Cocoa Processing Company of Ghana were done with key people responsible for corporate decision making. The authors believe therefore that, the information obtained was true and accurate.

2.8 Credibility of research

According to Patton (2002:553) the credibility of qualitative inquiry depends on three distinct but related inquiry elements:

- Rigorous methods for doing fieldwork that yield high-quality data that are systematically analyzed with attention to issues of credibility ;
- The credibility of the researcher, which is dependent on training, experience track record ,status, and presentation of self; and
- Philosophical belief in the value of qualitative inquiry, that is, a fundamental appreciation of naturalistic inquiry, qualitative methods, inductive analysis, purposeful sampling, and holistic thinking.

The outcome of this research work is credible to the best of the authors' knowledge because care was taken to systematically analyze all data collected, and also made sure that all data used are from credible sources and can therefore be used for future research work.

2.9 Method critique

According to Bryman (2004:284), research works can be too subjective. By this, it means that findings rely too much on the researcher's often unsystematic views about what is significant and important and also upon the close personal relationships that the researcher strikes up with the people studied.

The authors think that this research work carried out on Cocoa Processing Company of Ghana cannot be used to generalize an assumption that all manufacturing industries in Ghana does not use materials management concept.

3. FRAME OF REFERENCE

3.1 Introduction

This is where the authors would use theories which have been developed by other researchers. According to Strauss et al (1998:19-21) theory refers to a set of well-developed concepts related through statements of relationship, which together constitute an integrated framework that can be used to explain or predict phenomena. The theories developed therefore would be used as a frame of reference for this research.

3.2 Meaning of materials and materials management

According to Jessop et al (1994:42), the term materials can be said to be any physical substance used by a manufacturing industry to process or manufacture its products or goods for sale. It includes raw materials, spare parts, components, factory supplies, packaging etc. Materials Management has to do with production planning and control, purchasing, storage, inventory, and control of external transports, internal transport and material handling.

Materials management as defined by Schaafsma et al (1984:12) 'is a control of the flow of materials to and through a factory, the materials flow itself being regarded as a unit'. Schaafsma, went on to state that, 'materials management is built up from a number of identifiable activities (production control, procurement, stock control and goods handling); these activities are concentrated into a consistent organization'. Thus, the materials management function is a control function.

Materials management is the management process which integrates the flow of supplies into, through and out of an organization to achieve a level of service which ensures that the right materials are available at the right place at the right time, of the right quantity and quality and at the right cost". He further explained that, it includes the function of procurement, materials handling and storage, and inventory control, packaging, transport and associated information systems and their application throughout the supply, manufacturing, service and distribution sectors, Lysons (1992:36-37).

Also, Carter et al (1993:23-24), argued that, 'materials management brings together under one manager, the responsibility for determining the manufacturing requirements, scheduling the manufacturing process, purchasing, storing and distribution of materials'. As such it is concerned with, controls activities involved in the acquisition and use of all materials employed in the production of finished goods.

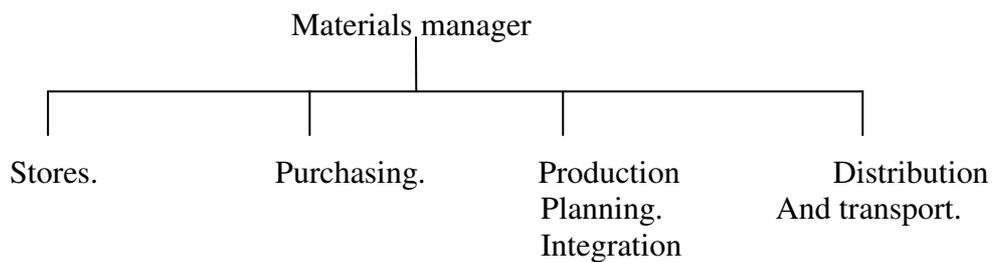
As can be deduced in the above definitions of Materials Management by various authors, the similarities observed from their definitions (procurement, materials handling, logistics, inventory control) etc. would form the basis of the authors frame of reference and motivation which would be further explained in the subsequent readings in relation to how they affect the cost of supplies.

3.3 Materials management organization

According to Carter et al (1993:24-25) “the Harvard Business Review survey revealed four major types of materials management organizations” and these are;

1. **Integrated structure.** This shows that the classical integrated materials management structure which accounted for 31 per cent of the companies in which a materials manager is said to exist. The diagram below shows an example of an integrated structure.

Figure 3 Integrated structure (own revision)



Source: R.J Carter et al (1993:24)

2. **Distribution orientated.** These are partially integrated organizations in which the distribution and traffic function, the production planning and inventory control function report together. The authors argued that, companies with such structures accounted for 23 per cent of the companies with materials managers, tended to integrate those materials functions that were closer to markets than to sources of supply in integration.
3. **Supply orientated.** These are partially integrated organizations in which the purchasing function and the production planning and inventory control functions report together. The authors discussed that, in such companies the two materials functions that reports to the same manger are closer to the supply end of the materials pipeline. This type of materials management organization accounted for 18 per cent of the cases in which the materials manager or the equivalent existed.
4. **Manufacturing oriented.** This type of structure is organized around manufacturing which is in the middle of the materials flow. The authors explained that this accounted for 28 per cent of the materials managers in the Harvard Business Review survey.

3.4 Functions of Materials management

According to Carter et al (1993:25) materials management works with all departments, the main objective being to provide the materials to right operating point, at the right time, in a usable condition and at a minimum cost. He stated further that, the basic functions of materials management are as follows:

- **Production and materials planning:** To ensure efficient use of personnel, materials facilities and capacity. This also covers assistance in both long and short term planning with control over the materials used and issued.
- **Materials handling:** The responsibility for accepting, handling and physically moving materials to production.
- **Procurement of goods:** The right time, the right quality and quantity and of course, the right price taking into account storage, delivery, handling cost and the maintenance of supplier relations are all the responsibility of materials management.
- **Distribution:** This deals with covering receipt, storage, dispatch of packaged finished goods and registration of all transactions.
- **Control of materials cost:** Where costs arise materials management must organize reduction programs for planning, stocks, purchasing, materials handling as well as providing an effective means of monitoring the effects of the programs.
- **Communication:** It is the responsibility of materials management department to ensure that a well balanced and efficient communication exists among the various departments.

The model below forms the main foundation of the authors' research work on materials management.

As previously stated by Lysons (1992:36-37) that, the concept of materials management is a process which integrates the flow of supplies through in and out of an organization, also includes the functions of procurement, materials handling and storage, production and inventory control, packaging and transport.

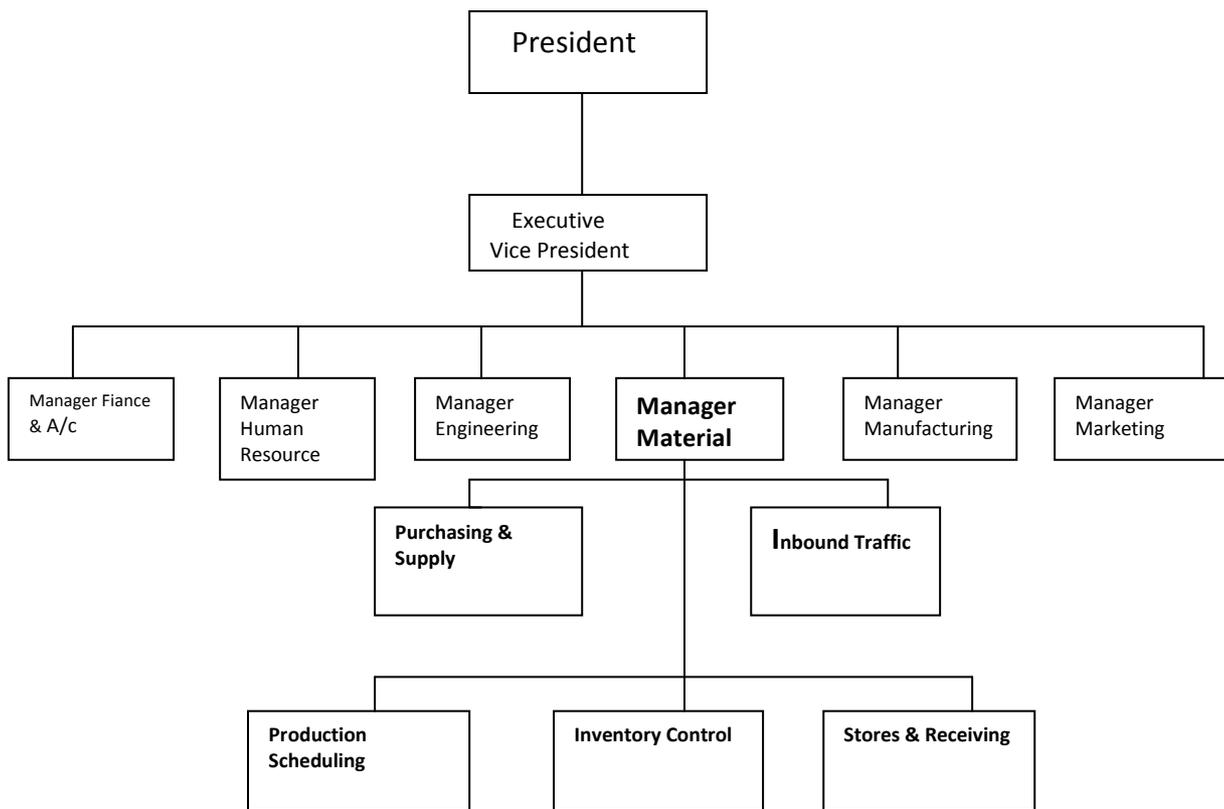


Figure 4 . structure of materials management concept (own revision)

Source: Dobler et al (1996:132)

According to Dobler et al (1996:131) over the past twenty years, the organizational structure below has become the classical model of materials management. He further explained that, a study was conducted by the Harvard Business School which covered two hundred and six firms of various sizes in a cross section of manufacturing industries. The study found out that with respect to the reporting level, fifty three per cent of the firms materials manager reports to a general manager, or executive vice president.

On the other hand, in forty three per cent of the firms, the materials manager reports to the manager of manufacturing and four per cent of the materials managers reports to the controller or the manager of finance. In these firms, the materials function is a second-level activity.

There are therefore two basic differences from the classical materials management model which are; (1) the level to which and the executive whom the materials management reports (2) the specific functions included in the materials department.

3.5 Materials management and forward planning

Carter et al (1993:271), defined forward planning as ‘the process of looking at trends and expectations and producing some kind of picture of what will happen in the future regarding the operations of the organizations and its effects upon management’. He further explained that, the materials system has often been neglected when it comes to involvement in forward planning discussions and meetings and many companies have found to their cost the error of leaving out a major part of the organization so directly involved with operations.

3.6 Materials management and corporate planning

According to Carter et al (1993:271-272), corporate planning is ‘a systematic and comprehensive process of long-range planning’. They also explained that, corporate planning process within an organization is the responsibility of senior management which is strategic in nature rather than functional because the process involves evaluating the organizational strength and weakness. From the opinion of Carter et al (1993:271), materials management should be involved in the process of corporate planning in the organization so as to ensure that data from the materials aspect of the business is considered when corporate plans are devised.

3.6.1 Sourcing

Zenz (1990:161) defined sourcing as a strategic philosophy of selecting vendors in a manner that makes them an integral part of the buying organization for the particular components they are to supply. The author argued that the most important purchasing decisions are concern with selecting the right sources of supply. That is, if the correct source decision is made in a particular instance, the buying company needs should be met perfectly. In such circumstances, it would receive the right goods in the right condition in the right quantity at the right time and at the right price.

3.6.2 Negotiation

According to Palman (1994:87), “Negotiation is a processing of planning, receiving and analyzing all data used by seller and buy to reach all acceptable agreement for the purchase order which include all aspect of the business transaction not just price”. Also, Lyson (1992:208) argued that “Negotiation is any form of verbal communication in which the participant seek to exploit relative competitive advantage and needs to achieve explicit or implicit objectives within the overall purpose of seeking to resolve problems which are barriers to agreement”. Negotiation is therefore the finest opportunity for the buyer to improve his company’s profits and obtain recognition.

3.6.3 Purchasing

Purchasing has been defined by Lyson (1992:1), as “that function responsible for obtaining by purchase, lease or other legal means, equipment, materials, supplies and services required by an undertaking for use in production”. In the above definition, the author argued that the term production has been used in an economic sense of creating utilities, i.e. goods and

services that satisfy wants and does not therefore only confined to manufacturing output but also applies to servicing, distributing, etc. organizations.

Carter (1993:249), also explain that purchasing is the department within materials management which is concerned with the process of ascertaining the organization's material and service needs, selecting suppliers, agreeing terms, placing orders and receiving goods and services. The author also state that, it is by nature a 'service' function, orientated to providing a complete supply-function service for users within the organization.

3.7 Materials management and logistics management

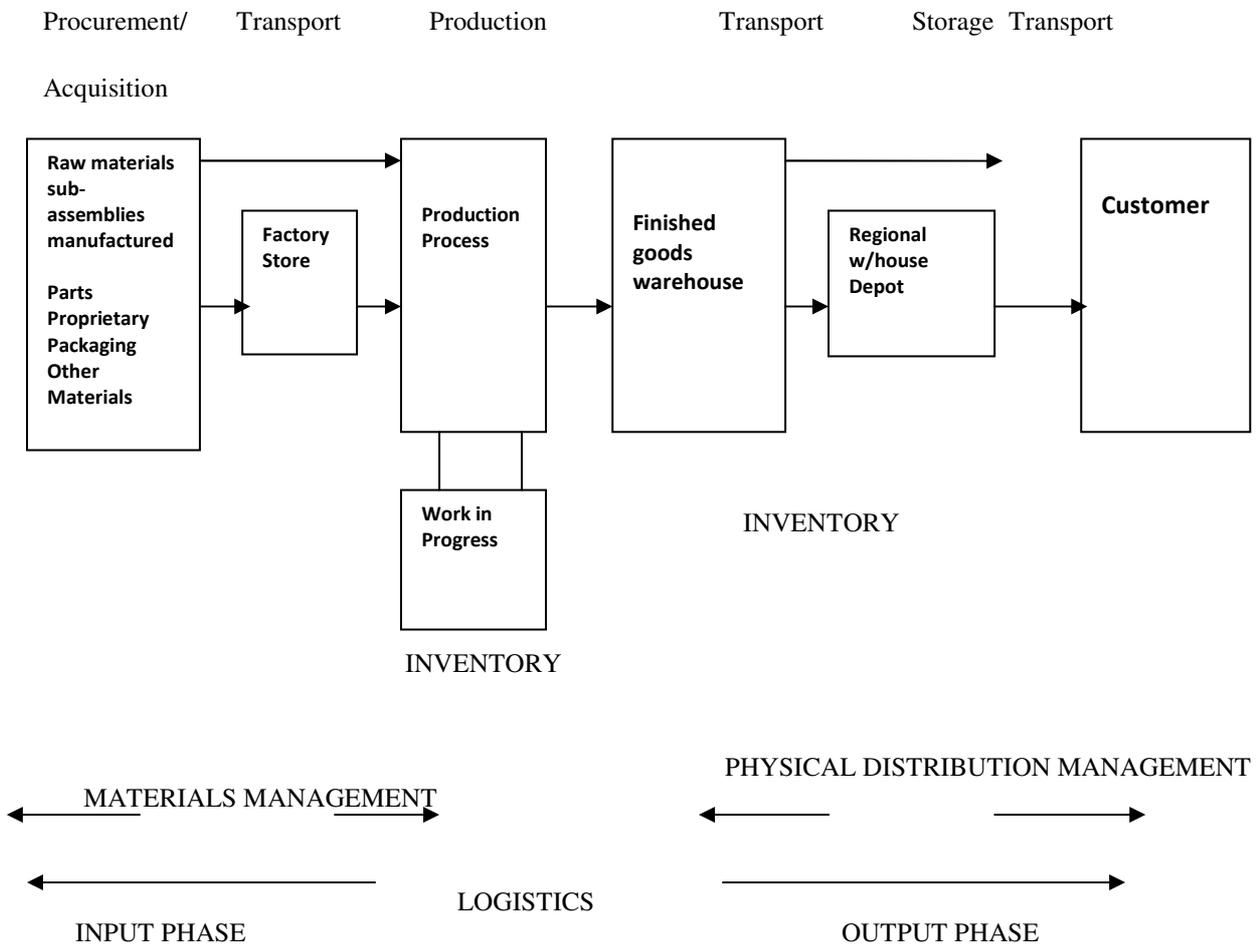
According to Lyons (1992:39), logistics management is 'the process of strategically managing the acquisition, movement and storage of materials, parts and finished inventory (and the related information flows) through the organization and its marketing channels in such a way that current and future profitability is maximized through the cost-effective fulfillment of orders'. Stevenson (2006:697), however, views logistics as the movement of materials and information in a supply chain. He further explained that, materials included all of the physical items used in a production process.

Logistics therefore is about competent and effectual use of the physical facilities of the distribution infrastructure and its role are technical and operational with a focus on developing tools and procedures for transportation, handling, and storing of large volumes of physical products, Håkansson et al (2006:10).

Lysons (1992:40) explained further that, several definitions of both materials management and logistics management make it complicated to tell between the activities that may be assigned to each field. It is therefore constructive to distinguish between Materials Management (MM) and Physical Distribution Management (PDM).

Materials management deals with bought-out items such as raw materials and components from suppliers to production, while the Physical distribution management relates to the output phase of moving finished goods from the factory through the appropriate channels of distribution to the final customer as showed in the diagram below. He further states that, 'activities such as storage, transportation and inventory management are common to both the input (MM) and the output phases (PDM) and that logistics management subsumes both'.

Figure 5: Materials management and Physical distribution management (own revision)



Source: C.K Lysons (1992:41)

3.8 Materials management and transportation

Transportation according to Carter et al (1993:336-338), “is the process of transporting goods and materials either within a network of internal location (i.e. depots) or the customer”. The author went on to state that, industrial society rest on trade, that is the movement of materials from where they are found, to a processing point and then the finished product to the market.

Langling et al (1992:269-270) , was of the view that, transportation systems is the physical link connecting a company customers, raw materials, suppliers, plant, warehouses, and channel members right to the node.

As the supply chain becomes increasingly longer in our global economy, the transportation function is connecting buyers and sellers that may be tens of thousands of miles apart. This increase spatial gap result in greater transportation cost. The total dollars spent in the US for example to move freight reveal the importance of transportation in any organization. In 1989 for example, the US spent an estimated \$327.5 billion to move freight which accounted for 6.26 per cent of the GNP. This total expenditure included shipment cost of \$3.6 billion for loading and unloading materials, freight cars and for operating and also controlling the transportation function Langley et al (1992:269-270).

3.9 Materials handling

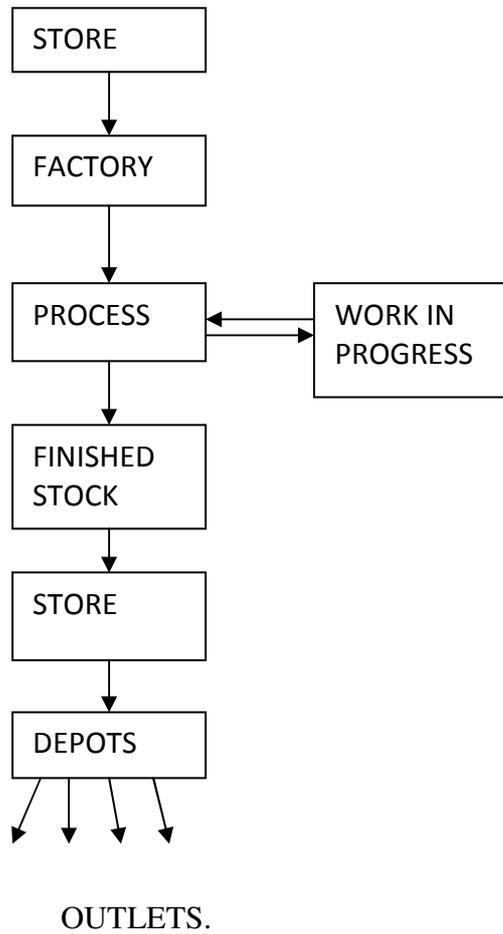
According to Jessop et al (1994:116), the British Standard Institute defines materials handling as “techniques employed to move, transport, store or distribute materials with or without the aid of mechanical appliances”. Carter et al (1993:191-192), also argued that one of the most basic prerequisite of any organization is to be able to transport materials, equipment, spares and plant from one designated point to another, as efficiently as possible. Carter et al (1993:191-192), pointed out the importance of materials handling and said that it is indicated by range and, in some cases, high cost of equipment that has been designed and developed to tackle the numerous problems materials handling that each organization has.

According to Carter et al (1993:191), materials handling is of vital importance to every organization in operational terms for the following reasons:

- Materials flow has to be maintained if output and distribution are to be maintained. Materials must be transported from the point of storage to the point of production, moved through the production process, returned to the stores and finally, transported in, and often through, the distribution system. The diagram below illustrates it.
- The health and safety of many members of the staff depend a great deal upon the type of materials handling system employed, the equipment operated and the level of training among the operators.
- The cost factor is vital in terms of operational costs, profits and overall costs of production. Handling materials is very expensive in terms of materials handling equipment, plant, time and labor. Therefore, the more efficiently and quickly materials can be moved, the more the cost per unit moved will be reduced.

- Materials damage can be a very expensive business and will certainly reduce the stock-life of many materials. Poor materials handling can produce all the problems of premature stock deterioration and cost that go with it.

Figure 6 Materials handling (own revision)



Source: Carter et al (1993:192)

3.10 Inventory management

An inventory according to Stevenson (2006:483) 'is a stock or store of goods'. As the production planning function has become more sophisticated in recent years, so too has its operating twin, inventory management, Dobler et al (1996:517). Lyson (1992:113) explained that inventory is an American accounting term for the value or quality of raw materials, components, work-in-progress and finished products that are kept or stored for use as the need arises.

Inventory management refers to the techniques needed to ensure that stock of raw materials or other supplies, work-in-progress and finished goods are kept at levels which provide maximum service levels of minimum costs.

Stevenson (2006:483), further argued that some organizations have excellent inventory management and many have satisfactory inventory management and that, too many also have unsatisfactory inventory management, which give credence to the fact that management does not recognize the importance of inventories, though, the recognition is there.

3.10.1 Functions of inventory

According to Dobler et al (1996:517), several statistics clearly point up the significance functions of inventories and that, in most manufacturing firms today, inventories constitute the second-largest category of assets shown on the balance sheet, exceeded only by physical facilities and equipment. Palman (1994:240-242), therefore is of the view that inventory management has two broad functions;

- **Inventory accounting:** Inventory accounting is concern with book keeping aspect of inventory management. This function deals with the entering, processing and distribution of inventory stock which intend to provide a history for all inventory transactions. The inventory accounting will also among others things provide information which could be use to compare 'book' inventory to actual physical count of inventory stock. In-accurate, incomplete or delays inventory transaction cannot be the basis for correct inventory planning. Unless strict control is established and maintained, the entire inventory management system will be of no value.
- **Inventory control:** This consists of planning, ordering, scheduling and the discharge of materials used in manufacturing process. The inventory manager is concern with all types of inventories in the company.

3.10.2 Need for inventory management

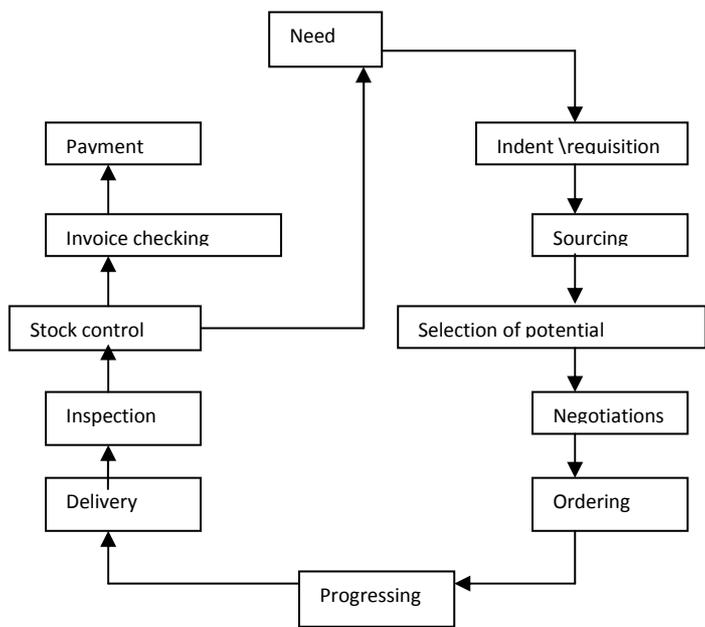
According to Dobler et al (1996:517), "Generally speaking, inventories make possible smooth and efficient operation of a manufacturing organization by decoupling individual segments of the total operation". However, Stevenson (2006:484), is of the opinion that a typical firm probably has about 30 per cent of its current assets and perhaps as much as 90 per cent of its working capital invested in inventory.

Organization responsibility varies from industry to industry, even within the industry and more particularly with the size of the company. Responsibility for inventory management was usually a multi-share function among most of the operating departments. Palman (1994:235) stated that, with the growing trend towards the materials management concept, top management has been the wisdom of delegating full authority and responsibility for handling of materials for one person- the materials manager.

Also, Carter et al (1993:142), argued out that ‘one of the reasons why the need for inventory has become important is too reduced the purchasing cycle’. He further explained that the purchasing cycle is the sequence of events that has to be gone through before an item is finally delivered to stock. When an organization holds a high stock, the number of times this cycle has to be gone through is reduced. This cut down the use of management and administrative resources and thus reduces the cost of ordering (i.e. typing of orders, postage, negotiations, telephone calls, progressing, invoice checking, and payments).

The diagram below illustrates the cycle.

Figure 7 Purchasing Cycle (own revision)



Source: Carter et al (1993:142)

3.10.3 Purpose of inventory management

Palman (1994:236-237) stated that, inventory was created for two main purpose and these are; Protection and Economy.

- Protection – To have adequate supplies of materials available to meet requirement for continuous operation. This would ensure that the inventory of finished product are obtainable to meet a demand, thus permitting marketing and sales to function with the knowledge that their order can be delivered as requested.
- Economy – To effect the product cost through the best economical order quantity purchase at a given time savings, thereby permitting large quantities to be purchased at one time.

3.11 The scope of materials control

According to Carter et al (1993:139), “ materials control is the process of ensuring that the stock held by the organization is supplied to those parts of the operation that require items (i.e. production, distribution, sales, engineering, etc.), bearing in mind the factors of time, location, quantity, quality and cost”. He further explained that, ‘ in these days of high interest rates, technological change, and vigorous competition and shifting market bases, the cost of inventory mismanagement has become prohibitive’.

In modern supply management, materials control is the real control function. In Carter et al (1993:139), opinion, the basic concept of materials control is simply the right material, in the right quantity, of the right quality, at the right time and place.

3.11.1 Cost involved in holding stocks

According to Carter et al (1993:139-140), there are several basic costs incurred by any organization which holds stocks of materials

- Interest on capital tied up.** When an organization builds up stock it has, first, to purchase that stock from suppliers. In many cases the goods will have to be paid for before those goods are processed by the organization, sold, and profit earned. Therefore there is a gap between the organization paying for the stock and the final selling of the finished item. This has the effect of committing a great deal of the organization’s money which will not earn any interest and cannot be used for any other purpose, until the goods are actually sold. If the period is of time is a long one, it can be very costly and can lead to cash flow problems for the organization.
- Materials handling cost.** When stocks are held by an organization they have to be stored and handled by the stores staff. This will include the use of expensive materials handling equipment, storage facilities and labor time.
- Stock maintenance.** Stock have to be stored in a certain conditions, depending on the items involved (e.g. warm, dry, cool, etc.). Such ‘environmental’ needs have to be met if deterioration of the stock is to be avoided. This can result in the building of

special storehouses, or the introduction of heating, ventilation and lighting systems, all of which are very expensive.

- d. **Obsolescence cost.** Materials held in stock may become obsolete and thus will add to the total costs of storage.
- e. **Insurance of stock.** Because of the amount of money tied up when stock are held, it is vital that the organization has adequate insurance cover, so that in the event of a fire, flood, or accident, the company will be able to claim from its insurers sufficient funds to replace the stock lost. Therefore the more stock is kept, the more money is tied up and so the insurance premiums will rise accordingly.
- f. **Administration of stores.** When goods are held in stock there is a great deal of administrative cost involved, including control of stock receipt, issues, stock records cards, bin cards, etc. All these duties take up resources in the form of space, labor, skills and time.
- g. **Security of stock.** Materials are cash and need to be stored in secure conditions, but security systems such as CCTV are expensive to buy and install. Stock losses to theft are added to the total cost of storage.

4. FINDINGS

4.1 Introduction

In this chapter, the authors will present the empirical data collected from Cocoa Processing Company of Ghana, showing how the aim of the research will be accomplished.

In an effort to obtain empirical information from the company, one of the authors had a face to face interview with the human resource and quality assurance managers. In addition to this was a telephone interview to four heads of departments and a questionnaire sent to fourteen employees. This process was to enable the authors elicit their opinions on how the Cocoa Processing Company manages its materials.

Adding to our sources of information for the empirical data are the company's homepage, some printed materials related to the company, given to us by the human resource manager and the head of procurement department on request to complement the research work.

4.2 Results

The findings are presented in a methodical manner to serve as guide to the structured questions of the interview and questionnaire in the light of the concept of materials management and its effects on cost of supplies. the operations of Cocoa Processing Company in order to give an understanding of the analysis and conclusions using the frame of reference in the final phase of the work.

4.3 Face-to-face Interview

4.3.1 Respondent: Human Resource Manager (Mr. Kwadwo Sintim)

Purchasing System in Cocoa Processing Company

According to the human resource manager, purchasing systems within cocoa processing company covers the various stages from the requisition and inquiry, through quotation analysis, placing the order and receipt of order acknowledgement. The inter-departmental liaison necessary is exemplified in considering the distribution of copies of these documents; he mentioned the following as the procedures:

The Requisition

From the interview, the authors learnt that, purchasing procedures in Cocoa Processing Company is unusually set in motion by a receipt of requisition. A need may originate in production department, technical stores department, marketing department, finance department etc.

The authority of purchase is usually given in a purchase requisition. This is normally signed by an authorized person. The requisition is carefully checked by purchasing to ensure, amongst other things that specifications are adequately described and requirements ordered in economic quantities for delivery to specific dates and rates.

Enquiry procedures

According to him, enquiries are presented to the appropriate offices by means of filling an enquiry forms, particularly, if there are a number of special features. These are addressed to a suitable number of suppliers, usually not less than three of sometimes not more than twelve. The company preliminary information is unusually obtained from, purchasing officer records of existing and previous suppliers, purchasing department library of catalogues, price lists, Cocoa purchasing clerks or salesmen etc.

Quotation analysis stage

He further stated that, upon receipt, quotation is scrutinized to ensure conformity with the inquiry, and then tabulated for comparison and analysis. According to him, the main advantage is that, it becomes comparatively easy for them to compare total potential costs and also terms of payment can easily be compared.

The factors to be considered in selecting a supplier from a number of quotations are:

- Price
- Quality of product offered
- Delivery
- Reliability and financial stability of the company quotation

Placing the order contract

He went on to state that, as soon as the supplier has been selected and the price to be paid for materials or items to be bought has been fixed, the next step is the preparation and issue of purchase order or contract.

The purchase order is essentially a legal document which provides an authority to the vendor firm to supply the materials or articles on the condition named and at the prices specified. Cocoa Processing Company then accepts and pays for the items when the order has been properly executed.

Acknowledgement

The company always secures an acknowledgement from the supplier to prove receipt of order and to establish the terms in which the contract is based on. The details of the acknowledgement are then compared with orders to check accuracy of all suppliers or to know what the delivery offered will be.

After the purchasing department has checked with the suppliers and indications made on any discrepancies on the acknowledgement (price change), the account department pays invoices on any changes that occurred. The acknowledgement copy can be directed to accounts approving any price changes, so reducing queries when the eventual invoices arrive.

Receipt of Goods

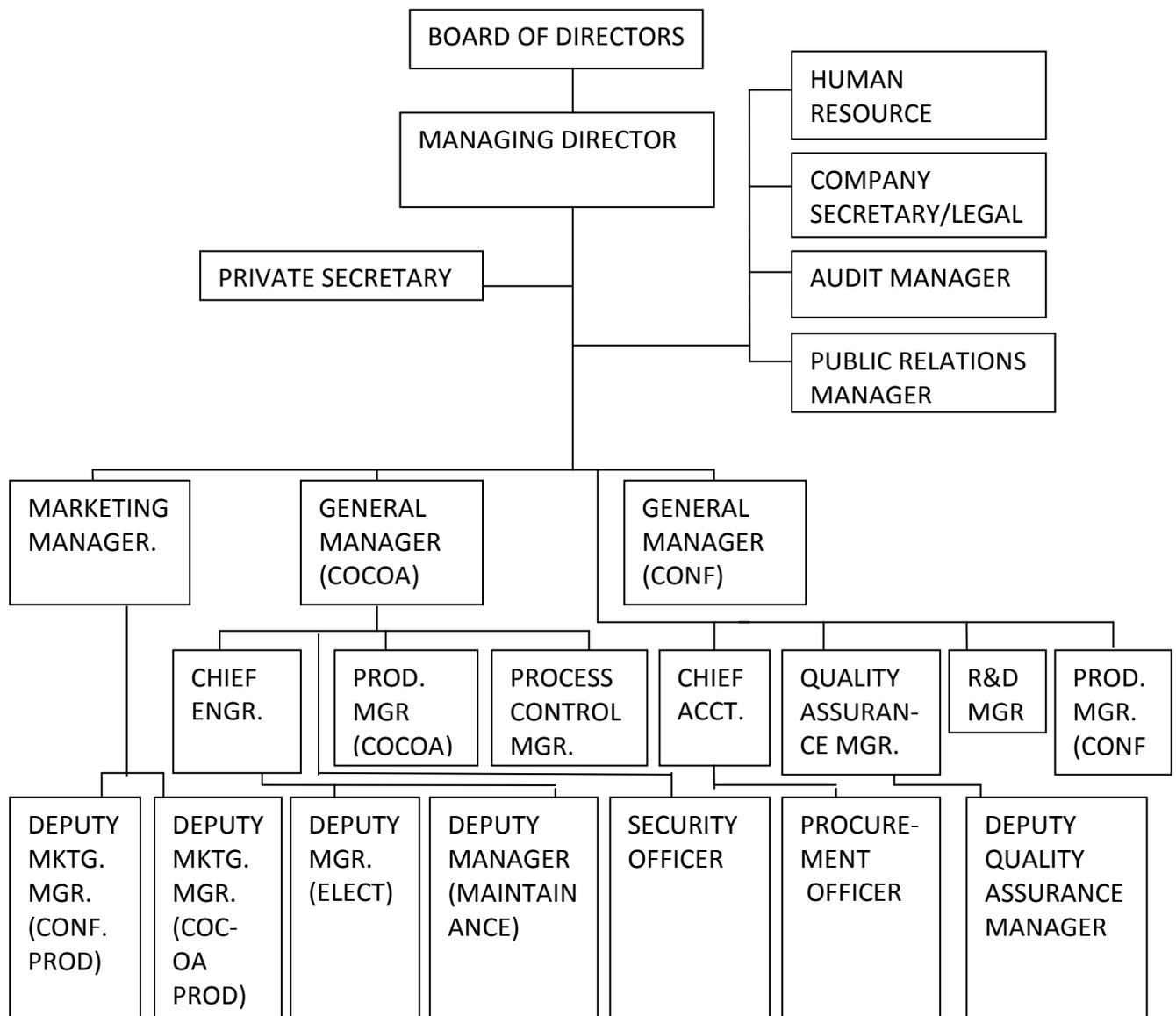
Incoming goods are delivered to the purchasing department team of inspectors on arrival to verify its right content and specification as stated on the quotation form. Inspection in this context means the examination of incoming commodities for the right quality and quantity.

Issue and Dispatch

This is the process of receiving demands, selecting the items required and handing them over to users. It also includes where necessary the packaging of issues, loading of vehicles with goods for delivery. In an effort to achieve cost reduction, the authors found out that, Cocoa Processing Company depends on short term measures to achieve reduction.

Organizational Structure of Cocoa Processing Company of Ghana

Figure 8 Company's organizational chart



Source: Cocoa Processing Company of Ghana.

Looking at the above organizational structure, Mr. Kwadwo Sintim explained that the structure is vertical; the main reason behind the vertical nature of the organization is the advantage for control and power. This is because, according to him, Cocoa Processing Company of Ghana was established by the government for the processing of raw cocoa beans and the manufacturing of chocolate and confectionary products in Ghana. He further explained that, the appointment of the board of directors and top managerial positions are politically motivated, as such initiation and formulation of policies are mostly in line with the government in power.

According to Mr. Kwadwo Sintim, it is the purchasing department that handles stocks in the organization and the current work force stands at two hundred and sixty eight after major changes were made to ensure efficiency in production levels. Furthermore, the authors were informed that, the raw materials and finished goods stores has been integrated into purchasing department.

4.3.2 Respondent: Quality Assurance Manager (Mr. Nathaniel Owusu Quao)

Processing methods of the company

According to the quality assurance manager, the company comprises of two factories, the cocoa factory which produces semi-finished products, and confectionary factory, which produces finished products.

The cocoa beans delivered to the cocoa factory are passed through the beans cleaner to remove foreign materials (dust twigs etc). The cleaned beans then undergo pre-treatment by the micronized and are broken to remove the shells. The cocoa nibs are roasted, then ground and further refined into a fine paste called cocoa liquor (cocoa masse).

He further explained that, the cocoa masse is heat-treated, tempered and packed, which is then pressed to extract cocoa butter to obtain natural cocoa cake. The cake (natural and alkalized) is pulverized into cocoa powder. The butter obtained after pressing is filtered, tempered and packed.

He also said that, the company uses hydraulic press method in extracting cocoa butter. In addition to cocoa butter and cocoa cake/ powder, the factory produces cocoa liquor, which is mainly used in the manufacturing of chocolate and confectionary products.

According to Mr. Nathaniel Owusu Quao, the essence of the quality assurance department within the organization is concerned with defect prevention which in one way or the other leads to the minimization of cost.

Confectionary Factory

The confectionary factory is one of the two factories of the company. According to Mr. Nathaniel Owusu Quao, the objectives of this factory are to produce high quality chocolate bars of various types to meet the changing needs of the market.

4.4 Telephone interview

4.4.1 Respondent: Procurement Officer (Mr. A Lamptey)

According to the procurement officer, although the concept of materials management makes an impact on manufacturing industries towards the minimization of cost, Cocoa Processing Company of Ghana has no materials management department. He said that, instead, the organization has purchasing department which manages the company's materials, and that before any purchase is made, the accounts department is consulted to give the final approval and the quantity to be purchased.

He further went on to explain that, this is the company's management policy, "and thus it clearly shows that, the purchasing department has no autonomy when it comes to matters concerning decision making on procurement". The stores in most organization is a temporal reception for materials or an area in which all kind of materials needed for production, distribution, maintenance etc are stored, received and issued. But from the interview, it was made mentioned by the procurement officer that, the stores department has been integrated into the purchasing department. He also explained that most of the stores personnel lack the required professional skills because they were appointed based on how long they have served the organization.

When the question was posed to Mr. A Lamptey as to which department is responsible for sourcing, he stated that, the purchasing department is responsible for that. But when it comes to sourcing for spare parts especially in the production department, it is done by the chief engineer without the assistance of the purchasing department. According to him, the purchasing of spare parts is a highly technical area and it requires high degree of specialized skills and knowledge on the part of the procurement officer which the department lacks.

However, according to him, the purchasing department also practices multiple sourcing especially where the intended order is a prompting item. From his view, the purchasing department is manned by qualified personnel but not professionals in the field of procurement.

He stated that, the departments as a whole does not practice a decentralized purchasing system, because items required at each plant are largely homogenous, and as such orders are placed centrally and deliveries made against the contract as required by local plant. But in cases of sourcing and procuring of spare parts, the engineering department does it.

Mr. A Lamptey explained that, "he has knowledge on world class concept such as Just in Time, total quality management and benchmarking but because of management policy; there is no room for him to come out with initiatives". He stated further that, the stores department has been integrated into the purchasing department as a result of a directive which came from top management. On issues concerning suppliers, he explained that the company's main supplier of raw cocoa beans is the Produce Buying Company, but on the other hand, other materials are sourced by the purchasing department.

4.4.2 Respondent: Chief Accountant (Mr. Timothy Godfrey Essandoh)

According to the chief accountant, the relationship between the purchasing department and accounts covers vital areas. It is the responsibility of the purchasing department to report to the accounts department concerning what quantity to purchase and at what price. The accounts depends on purchasing department for information concerning stocks held by the organization, and about items damaged so that it could be written off the asset list.

He further stated that, purchasing department provides information's on receipt and confirmation of goods into the organization so that payment could be effected. The purchasing department provides continues data on stocks used in operations which aids the accounts departments in its cost allocation functions. Mr. Timothy Godfrey Essandoh again explained that, the accounts department is responsible for internal auditing of all departments.

4.4.3 Respondent: Marketing manageress (Mrs. Genevieve Dahlia Pawar)

According to the marketing manageress, her department performs the role of marketing research and development, planning and executing of the marketing activities within the organization which includes pricing, promotion and distribution of the finish products.

Her department also relies on the purchasing department to ensure that all stock held for sale are stored, issued and controlled as efficiently as possible. The sales staffs continuously depend on the purchasing department; to ensure that finish stock is available as and when required.

When the question of how the organization ensures quicker distribution to the various depots for easy access to consumers was posed, she replied that, after the right packaging has been done and right inventories taken by officers, goods are transported to the various company depots depending on request with company trucks far ahead of time before the various depots run out of stock.

With issue of materials management, she confirmed that the organization does not have materials management department.

4.4.4 Respondent: Security Officer

According to the security officer, the security department is responsible for the security of the purchasing department. He further stated that, the security department is responsible for ensuring that all in-coming and outgoing materials are under his control, his department also ensures that employee's follows safety precautions to avoid dangers such as fire outbreaks and theft that can cause severe losses for organization.

5. ANALYSIS

5.1 Introduction

In this chapter, the authors would present the results of their findings and analyze them in accordance to the frame of reference used. Also, the answer to the problem statement would be provided and the aim of the research would be fulfilled based on the frame of reference.

5.2 The concept of materials management

Materials management is essential to all manufacturing firms because time and economic delivery is necessary to maintain efficient continuous production. In the authors' findings, it was discovered that even though Cocoa Processing Company of Ghana is a manufacturing company that engages in the manufacturing of raw cocoa beans and the processing of confectionary products, the company lacks materials management department.

In the authors' opinion, based on the theories used in the frame of reference and the findings, the purchasing department within Cocoa Processing Company of Ghana should not be performing the functions that they are currently engaged in because according to Carter et al (1993:249), purchasing is a service function oriented to providing a complete supply-function service for users within the organization.

To further support the authors' opinion, Carter et al (1993:249) again explained that, purchasing is that department within 'materials management' which is concerned (with the process of ascertaining) the organization's materials and service needs, selecting suppliers, agreeing terms, placing orders, and receiving goods and services.

Materials management as argued by Cartel et al (1993:23-24), brings together under one manager, the responsibility for determining the manufacturing requirement, scheduling the manufacturing process, purchasing, storing and distribution of materials. This gives credence to the fact that, the concept of materials management does not limit itself to purchasing but involves in the storing, production planning and distribution of goods to the final consumer as seen in the integrated structure. (See fig 3).

In the authors' findings, it was found out that the company has chosen to replace materials management with purchasing. Thus, the department is engaged in sourcing, selection of potential suppliers, negotiation, and ordering and storage activities. The above mentioned are the responsibilities of the purchasing department with the exception of the storage of materials.

In the authors' opinion, if the organization has chosen to replace materials management with the purchasing department as seen in the diagram in (fig 8), then the purchasing functions should end after the materials have arrived at the organization's premises.

The materials therefore should be accepted by the store's manager since the stores functions are concerned with receiving, storing and issuing of materials for manufacturing and other users within the organization. The stores function in addition includes issuing of finish goods

to the external market. However, following the response from the procurement officer, the authors' found out that, the company has integrated the stores department into the purchasing department. The integration has overburden the purchasing department performing activities outside the purchasing function, this means that, the personnel performing the store functions are not qualified, and therefore could lead to mal-administration of the stores function leading to high organizational cost.

In the authors' opinion, if the concept of materials management is accepted and implemented in Cocoa Processing Company of Ghana, it could lead to cost minimization. In support of this statement, Stevenson (2006:484), argued that, a typical manufacturing firm probably has about thirty percent of its current assets and perhaps as much as ninety percent of its working capital invested in inventory. Therefore, the application of the materials management concept with well qualified personnel will minimize the cost of supply in Cocoa Processing Company of Ghana.

5.3 Functions of materials management in an organization

The implementation of materials management concept in Cocoa Processing Company of Ghana can generate a number of valuable advantages in terms of cost minimization. Carter et al (1993:25) explains that, materials management works with all departments, the main objective being to provide the materials to right operating point, at the right time, in a usable condition and at a minimum cost. The functions of materials management are as follows:

- ***Production and materials planning:*** If Cocoa Processing Company of Ghana should implement the materials management concept, then tactical planning which includes practical implementation of corporate strategy in relation to production, distribution and stocks could be effectively utilized, but in the authors' findings, it was found out that, the purchasing department performs materials planning and scheduling which is not in line with the purchasing function, hence leading to cost increase to the organization.
- ***Materials handling:*** If the concept of materials management is in place, it will not only be the responsibility of that department to accept, handle and move materials to production, but also distribute finish goods to the depots. (*see fig, 7*). As stated earlier on, the cost factor is vital in terms of operational cost, and materials handling is very expensive in terms of equipment, plant, time and labor, therefore, the more efficiently and quickly materials can be moved, the more the cost per unit moved will be reduced, Carter et al (1993:191), but with reference to the authors findings, it was discovered that in Cocoa Processing Company of Ghana, the function of distributing finished goods to depots is done by the marketing department.
- ***Procurement of goods:*** If the material management concept is accepted and implemented in Cocoa Processing Company of Ghana, the purchasing function which includes procuring materials at the right time, the right quantity, the right quality and at the right price, maintenance of supplier relations would be performed by the materials management department, in addition to provision of storage which is not the responsibility of purchasing, (*see fig 4*).

- ***Distribution:*** The function of the materials management department covers the physical distribution of goods and it includes the receipt, storage and dispatch packaged finished goods and registration of all transactions (*see fig 5*).

From the findings, Cocoa Processing Company of Ghana's physical distribution processes of goods is handled by the purchasing department and the marketing department from procuring of raw materials to the distribution of finished products to the company's depots respectively. These divided activities by both departments can create gaps in the supply chain and cause an increase in cost to the organization.

The authors discovered that, there are at times that the company runs out of stock of raw materials and this causes breaks in the production process thus customers demands may not be met on time. This practice can cause customer loyalty to break down, and in situations where there are close substitute of the product by competitors, loyal customers may move to purchase goods from other competitors and this customer defections goes a long way to affect profit levels.

- ***Control of materials cost:*** Material management also involves the planning of innovative programs aimed at reducing cost when it arises on stocks held, purchasing and materials handling, and also monitors these programs to ensure its success in organizations which practices it.

The absence of materials management practice within Cocoa Processing Company of Ghana may not benefit from these innovative strategies to reduce cost when it arises. From the findings, the purchasing department does not draw any initiative programs on its own, but rather decision are made at the top management level for onward implementation at the purchasing level because of the central system of administration which the company practices.

When cost arises, in terms of stocks held which does occur from time to time, it was found out that, because of poor storage facilities in the company premises, raw materials do sometimes go bad because of this poor storage conditions which increases cost to the company.

- ***Communication:*** Materials management department also ensures that there exist efficient communication systems amongst all departments for free flow of information which create an effective production network in an organization to increase output (*see fig 4*). This is because, in a typical manufacturing organization which practices centralized and vertical administrative structure, the materials manager is an integral part of decision making process and relates with other departmental heads production effectiveness, the manager also serves as a linkage between top management and other team members.

The findings show that, within Cocoa processing company of Ghana which is a typical manufacturing organization, it is the purchasing department that is responsible for procurement of raw materials into the organization for production process, yet the procuring officer does not form part of management decision making, and does not take decisions on procurement and reports to the chief accountant because of the organizational structure.

5. 4 Materials management practice in an organization

The importance of organizational structure cannot be undermined because it promotes greater productivity of working systems, clear assignment of responsibility to personnel and a clear definition of authority which improves the use of management time and also establishes a chain of promotion among employees within the organization. When the assignment of responsibilities is unclear, work may not get done and efforts may be duplicated.

In Cocoa Processing Company of Ghana, the authors' found out that, the organizational structure is vertical (see fig.8) with the purchasing department which controls the organization's raw materials at the bottom. The procurement officer therefore reports to the chief accountant. Following the interview with the human resource manager and also the response from the questionnaire, the authors also discovered that, the company practices a centralized purchasing system.

In the authors' opinion, since the purchasing department holds a central role in moving materials into and through the organization, the procurement officer should be playing a management role within the organization. This means that, he should be reporting to the general manager (cocoa) and not the chief accountant. He should therefore be at the same level as the chief accountant.

This is one of the reasons why the authors' are advocating for the concept of materials management which should be practiced in a typical manufacturing organization like Cocoa Processing Company of Ghana. According to authors' frame of reference, a study conducted by the Harvard Business School which covered two hundred and six firms of various sizes, in a cross section of manufacturing industries discovered that with respect to reporting level, fifty three percent of the firm's materials manager reports to a general manager, or executive vice president, (see fig. 4).

However, in the authors' findings, it was discovered that the responsibility of the various materials activities is divided between two functional departments, (purchasing and engineering departments). This division of responsibility makes it difficult to coordinate unified activities of the materials oriented department within Cocoa Processing Company of Ghana. This conflicting interest between the purchasing department and the engineering department makes it difficult to identify the organization's total materials cost.

Another reason why the authors' are advocating for the concept of materials management is that, all activities relating to materials which forms about ninety percent of the working capital invested in inventory would be assigned to a single operating department. This would make it easier for total materials cost identification.

In the authors' opinion based on the frame of reference and the argument above, if Cocoa Processing Company of Ghana can accept and implement the concept of materials management, then the conflict of interest existing between the purchasing department and the engineering department will be solved. This means that, the materials manager would be coordinating and performing activities such as purchasing, production scheduling, inventory control, inbound traffic, and stores and receiving functions, (see fig. 4). The materials manager would therefore be reporting to the general manager cocoa.

5.5 Materials management and corporate planning

The process of corporate planning within an organization is the responsibility of management which is strategic in nature as stated in the authors' frame of reference. In Cocoa Processing Company of Ghana, although the purchasing department is responsible for managing the materials of the organization with the exception of spare parts, the department is not involved in corporate planning regarding the acquisition of raw materials for manufacturing.

Following the interview with procurement officer, and also response from the questionnaire, the authors found out that the management within the Cocoa Processing Company of Ghana does not recognized the purchasing department as an autonomous body on its own. In the authors' opinion, since the purchasing department is part of the centralized structure of the entire organization, it should be involved in the decision-making processing concerning procurement of all raw materials for manufacturing.

If the management of Cocoa Processing Company of Ghana accept and implement the concept of materials management, then the department will be autonomous to coordinate the purchasing function, production scheduling, inventory control, stores & receiving function and inbound traffic function. (See fig. 3).

Carter et al (1993:271) argue that, materials management should be involved in the process of corporate planning in the organization so as to ensure that data from the materials aspect of the business is considered when corporate plans are devised.

5.6 Forward Planning within a Manufacturing Organization

A recap of our frame of reference indicates that forward planning as explained by Carter et al (1993:271) is a materials management process of looking at trends and expectations and producing some kind of picture of what will happen in the future regarding the operations of the organization and its effect upon management.

Following the authors findings, it was found out that the purchasing department within the Cocoa Processing Company of Ghana which directly deals with materials is not effectively involved in planning for unforeseen contingencies. From the findings, the human resource manager stated that as part of management policy, the purchasing department has no autonomy when it comes to procurement decisions.

Furthermore, the authors also found out that the organization purchases materials in the short term for manufacturing, however, they are of the opinion that, to effectively deal with shortages which affect production process and cause an overall increase cost levels in the long-run, the organization needs to forecast through research to find out the needs of customers both home and abroad, the quantities they need, at what price and quality and features, when the goods are needed so that it can be factored into the amount of raw materials to be purchased from suppliers far in advance to produce goods and service regularly to meet the needs of customers on the market.

To keep up with demand trends of customers, the organization should find ways of improving and increasing storage systems to accommodate goods. This in a way will help in the flow of materials needed for production and to store finish goods before dispatch is made to final destinations.

5.7 Materials management and logistics management

Improvement in materials management and logistics management can both change and enhance the role of procurement and also distribution for an organization, because it reduces conflict and promote co-operation and coordination between materials management and physical distribution, based on the recognition that their activities are somehow interrelated and interdependent. This gives evidence to the fact that logistics management bridges the gap between materials management and physical distribution management (see fig.5).

Following the interview with the procurement officer and also response from the questionnaire, the authors found out that, Cocoa Processing Company of Ghana experience shortages. As stated by Lysons (1992:40) that materials management deals with bought-out items such as raw materials and components from suppliers to production, while the physical distribution management relates to the output phase of moving finished goods from the factory through the appropriate channels of distribution to the final customer (see fig. 5).

From the above explanation by Lysons, it could be deduce that logistics management or the logistics manager calculate the initial input factor, on both sides of the production process which terminate when the customer pays for the product and received them . The longer the time at each stage of the supply chain, the higher the cost incurred by the organization. A reduction in the time at each stage will provide an opportunity of cost minimization which can, in turn, lead to a reduction in price.

It is therefore the opinion of the authors that, in order to prevent the outcome of shortages which Cocoa Processing Company of Ghana normally experiences, the concept of materials management should be adopted because physical distribution of stock throughout the company's storage system or warehouse can greatly affect the level of sales and profits. A lack of stock in a given area (factory store, finished goods warehouse, and regional warehouse or depot) could lead to a loss of revenue in the short term and a loss of reputation in the long term to the organization.

Logistics management can therefore contribute to materials management and physical distribution management by linking the external supply network with production, transportation and marketing. It can also ensure the highest possible level of customer service and satisfaction by achieving the right combination of product availability and dependability.

5.8 Materials management and transportation

The transportation function forms an integral part of materials management according to Carter et al (1993:24-25), and accounted for 23 percent of all companies which materials management exist in practice. (*see* fig 3).

From the interview, the authors found out that, it is the purchasing department that procures and transport raw materials (inbound) needed for production within the organization with the exception of spare parts which are done by the engineering department because of the specialized knowledge required. The purchasing department is also responsible for the internal distribution of materials to various departments for production. Transportation of finished goods to depots and external markets shift entirely from purchasing department to marketing department.

With reference to the above situation, cost can be incurred; in the sense that, given the duty to the marketing department can create delays when goods are transported within the supply chain.

However, under the materials management concept, the transportation activities from inbound to outbound of finished goods are controlled under one manager. This includes procurement, transporting, distribution within operational point and delivery of goods to its final point is controlled through planning and coordination to reduce cost (*see fig 3*).

5.9 Inventory management

This refers to the techniques needed to ensure that stock of raw materials or other supplies, work-in-progress and finished goods are kept at levels which provide maximum service levels of minimum costs. Stevenson (2006:483), he further argued that, some organizations have excellent inventory management and many have satisfactory inventory management and that, too many also have unsatisfactory inventory management, which give credence to the fact that management does not recognize the importance of inventories, though, the recognition is there.

From the findings, the authors' found out that, the only inventories that are held in the organization are the raw materials and other items used in production in the short term due to the absence of storage facilities.

From the authors' findings, the company purchases in the short term and does not practice the just-in time concept which shows that there is a tendency of cost to be incurred.

Stevenson (2006:484), argues that, in a typical manufacturing organization, 30 percent of its current assets and perhaps as much as 90 percent of its working capital invested in inventory. Costs associated with the existence of inventories are due to a number of causes: property taxes, storage and handling, insurance, spoilage, obsolescence and pilferage, and all these component changes as the level of inventories change.

6. CONCLUSIONS/RECOMMENDATIONS

6.1 Introduction

In this chapter, the authors would make their conclusions, and give a recommendation based on the research work.

6.2 Conclusions

The materials management concept which brings together under one manager, the responsibility for determining the manufacturing requirements, scheduling the manufacturing process, purchasing, storing, and distribution of materials is seen as essential to all manufacturing firms of which Cocoa Processing Company of Ghana is of no exception.

Financially, materials (inventories) are very important to manufacturing companies and on the balance sheet for example, they usually represent from twenty to sixty percent of total assets. Therefore, if the application of the concept of materials management is accepted with well qualified personnel, it could lead to the minimization of cost. The interrelationship of activities of purchasing, inventory control and traffic, and production control were mentioned as activities within the materials management concept.

However, the authors' pointed out that the function of a materials manager is to promote coordination and integration within the supply chain and the major benefits are assumed to be; reduction in interdepartmental conflicts, reduction of inventory levels, reduction of materials handling costs and increased knowledge of total corporate operations among others.

In trying to illustrate how the concept of materials management can minimize the cost of supplies in Cocoa Processing Company of Ghana, the authors' were able to base their argument on the theories used in the frame of reference in connection to the research findings obtained from the organization. This helped the authors to establish the relationship between the purchasing function existing in Cocoa Processing Company of Ghana and that of the materials management concept which the authors, in their opinion deem fit for the organization.

Though corporate planning within a manufacturing organization is responsibility of management, and is strategic in nature, in Cocoa Processing Company of Ghana was the purchasing function is centralized, the department is not involved in the decision-making process in the acquisition of materials for manufacturing activities.

It is for these reasons that the authors' are advocating for the concept of materials management in Cocoa Processing Company of Ghana which in their opinion could minimize the cost of materials.

6.3 Recommendations

On the basis of the above findings, the following recommendation has been made. The concept of materials management is essential to all manufacturing firms. Since it has been established through the authors' research that, a typical manufacturing firm probably has about thirty percent of its current assets and perhaps as much as ninety percent of its working capital invested in inventory, it is therefore the authors' opinion that, a company like Cocoa Processing Company of Ghana, which uses an enormous quantity of raw materials for manufacturing, should not lack a materials management department.

The concept which if accepted and implemented, would generate a number of valuable advantages to Cocoa Processing Company of Ghana, in terms of total organizational control and materials control. It would lead to identification of cost of materials flow through the organization, enabling the materials manager to pinpoint rising cost areas in order to take appropriate action. The close coordination between the materials based department would allow efficient use of transport service, leading to the minimization of transportation cost.

It is therefore the authors' suggestion that, the materials management department should be included on the organizations' structure and at a level that can make it easy for the department head (materials manager) to communicate its intentions directly to the general manager cocoa or general manager confectionaries and not the chief accountant.

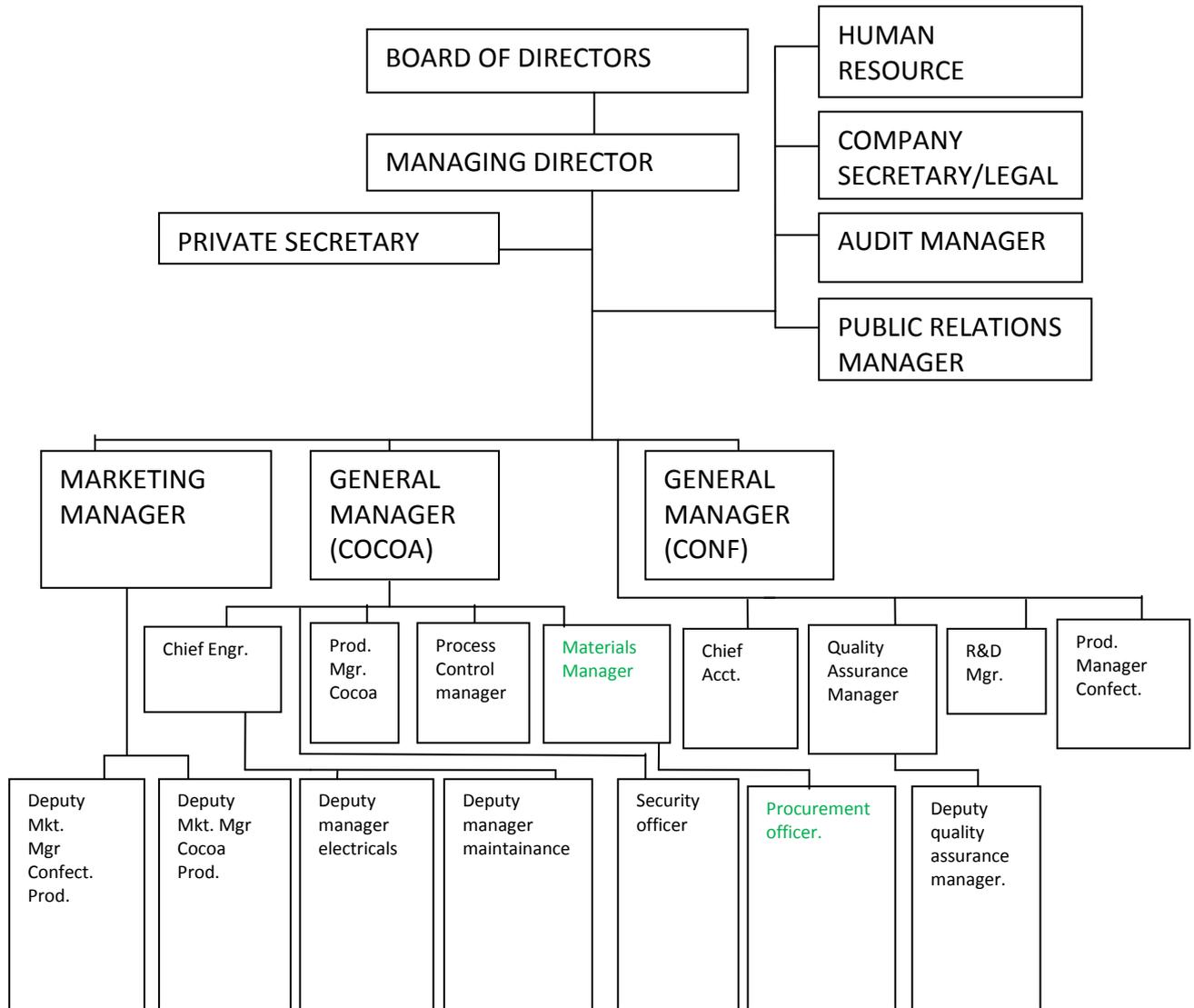
The appointment of a materials manager responsible for all aspect of materials would not only pinpoint total responsibility for the materials part of the business but create a link between the materials and non-materials based parts of organization.

Finally, it is the authors' suggestion that, the management of Cocoa Processing Company of Ghana should employ qualified staff with the professional skills in the area of materials management, purchasing and supply management, and logistics and transport management to man the department.

In-service training of the above mentioned professionals should be organized annually by management. This training should be seen by the management of the organization as an investment since the reward would lead to the minimization of cost to the organization. The training of the above mentioned staff would help promote motivation, organizational loyalty, and continue development of staff which would improve staff competency in the area of materials management and therefore lead to cost minimization in the long run.

The diagram below represents the revised organizational chart for the proposed concept:

Figure 9: Revised organizational chart



Source: own diagram.

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7B. APPENDIXES

Interview Questions

- Does your company have materials management department?
- Why does Cocoa Processing Company prefer purchasing department to Materials management department?
- In your opinion, do you think the concept of materials management could be beneficial to your company in terms of cost reduction?
- In your opinion, has the purchasing department contributed to cost reduction looking at the fact that your company has poor storage facilities?
- What is the current workforce of the organization?
- How does the company source for materials from suppliers?
- Why has the organization integrated stores into purchasing department?
- Do you adopt quality control measures?
- Do you inspect materials before accepting them into the stores or warehouse?
- Do you put measures in place to prevent cases of stock out?

- What strategic measures does management take to ensure that finish goods leave company's premises to its customers on time?
- How do you ensure that bulk goods from supplies reach the company's premises in time for production since you experience shortages?
- What channels do you use to distribute goods to your customers both home and abroad?
- What role does the security department play in the organization?

27th December 2007

Questionnaire for workers

Questionnaires for the research

This questionnaire has been designed to enable the students to carry out a research on Materials Management and its effects on cost of Supplies. The study is purely an academic work. It is in partial fulfillment for the award of Master of Science in Business Administration at the Mälardalen University, Vasteras-Sweden.

Your assistance is therefore needed and also your comments will be taken in confident

Note: Respondents should please tick () in the box which corresponds to the statement, which in your opinion is the best answerer for the relevant question or explain further if necessary.

Respondent Department.....

Name of Company.....

Status/ Title.....

Number of years Served.....

1. Does your company have a Materials Management department?

Yes () or No ()

2. Which department is responsible for Materials Planning and Scheduling?

Purchasing department (), Stores department (), Materials Management department

3. Who or which department purchase Materials into the organization?

Account department (), Purchasing department (), the department that needs it ()

4. What is the qualification of those responsible for materials and parts in the company?

Long service workers (), Purchasing qualification (), Accounting qualification

5. Which department does sourcing of materials or parts needed by the company?

Purchasing department (), Accounts department (), Department that needs it ()

6. Do you put measures in place to prevent cases of stock out?

Yes () or No ()

7. How does the company source for materials from suppliers?
Negotiating () Invitation to tender () any other (specify) ()
8. If yes what are the most important criteria does the company considers
Price () Quality () Delivery period ()
9. Do you inspect materials before accepting them into the stores or warehouse?
Yes () or No ()
10. Do you have any idea on World Class Concept like Just in Time, Total Quality Management, and Benchmarking etc?
Yes () or No ()
11. Do you adopt quality control measures?
Yes () or No () Do you practice them...
12. What method of materials handling system do you adopt?
Mechanical (), Manual (), Both ()
13. How do you dispose off your obsolete and scrap items?
Selling to other firm (), Donation (), Burning ()
14. Do purchasing take their own decision concerning acquisition and management of materials?
Yes () or No ()
15. Do management recognized purchasing as a body on it own and indicate as such on the organizational structure?
Yes () or No ()
16. Who does purchasing managers' reports to?
Accountant (), Managing director (), other specify
17. Do the organization experience shortage?
Yes () No ()
18. Do you have a decentralized purchasing function?
Yes () or No ()
19. Is purchasing responsible for all acquisitions of materials into the organization?
Yes () No ()
20. Does top management like the Managing director, Financial Controller etc. insist on what to purchase concerning quantity, quality, and price?
Yes () No ()
21. Which of the following do you practice?
Single Sourcing () Multiple Sourcing () Partnership Sourcing ()

