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Maximizing Profitability through Material Management

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Abstract: **One of the problems facing Manufacturing Company is the growing trend towards the higher cost of materials and services and constant shut down of factory, which erode business profit. The paper focuses on how business firm can attain profitability through effective management of materials. The objective of this paper is to identity problems of material management, which if corrected can result in profitability. The paper also examines and outlines the roles and benefits of materials management. Secondary data and primary data were utilized in this study. The finding shows that there is need to recognize the materials management function and it has been suggested that for a firm to achieve profitability, the goal of materials management outlined in this paper should be properly carried out**.

Key words: **Management, production, profit, materials, prudent.**

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1. INTRODUCTION

Profit is the entrepreneur's reward and in fact, a major motive for doing business. Most often too, it is used as an index for measuring performance. This paper is under- taken to outline how profitability can be achieved through effective management of raw materials. It focuses on cost reductions, adequate supply of materials and proper storage.

Materials management is that aspect of business activity that deals with planning for purchasing, receiving, handling, storing, and releasing of materials for use in production with effective control measures. Materials are industrial goods that will become part of another physical product. Rumelt (1981) has classified materials for use in manufacture under three headings:

- Raw materials primarily from agriculture and the various extractive industries e.g. mineral resources, fruits, and vegetables sold to processor.
- Semi finished goods and processed materials to which some work has been applied or value added e.g. rods, wires, paper, chemicals, etc.
- Component parts and assemblies that are completely finished products of one manufacture, which can be used as part of more complex product by another manufactures.

Consequently, it is the managing of these materials that we refer to as materials management. Thus, materials management has been defined by Lee and Dobler (1997:47) as the total of all those tasks, functions and routines which are concerned with the transfer of external materials and services into the organization and the ad- ministration of same until they are consumed or used up in the process of production, operation or sales. Materials management includes all the activities relating to the acquisition, handling and control, and movement of mate- rials and supplies used in the production for a firm's final product.

Materials management is a tool that can be used effec- tively in promoting profit maximization in a company. The objective of materials management is to maximize the use of the firms' resources by ensuring adequate supply of materials for production process and also minimizing cost of holding excessive inventories. This objective when achieved, leads to cost reduction and improve profitability. The researcher, therefore, intend to study profitability through effective management of materials, with Benue Brewery Ltd, Makurdi, Nigeria as a case study.

Statement of the problem

In recent years Rairu Distilleries, Gwalior has suffered from inefficient and imprudent management of resources and product scarcity, which has resulted in invaluable economic and social losses to the society. On the surface, this scarcity has been attributed to shut downs and breakdown at the brewery due largely to a lack of smooth maintenance activities in the plant, which is brought about by the unavailability of replacement of parts, which should have been provided by the materials management department.

The function of the materials management department is very important especially in view of the difficulties associated with the purchase of equipment spares, which in most cases are foreign-sourced. Frequently, the materials management department has been accused for the frequent breakdown and shut downs as a result of its inability to provide the necessary spares as at when they are need.

The researcher postulated this null hypothesis:
There is no significant relationship between materials management problems and the frequent breakdown and shut down of the plant.

Profitability

Profit is usually what is left after all the costs have been removed from the accrued revenue from sales. Therefore, profit 1S a controllable factor to the extent that management can control his revenue through price on one hand and through costs on the other hand.

Low level of marketing profitability in Nigeria would not be unexpected given the rates at which costs rise. Profit, of course, represents the balance from revenue after all costs has been deducted. Evidently, there has been a rise in the cost of raw materials labour, capital and in the general overhead costs. For instance, transportation cost has risen significantly in the recent past with the fuel price increasing to about N75/L as compared to the N17/L it sold last before the democratic governance. Rise in costs are threats to profits especially where the marginal increase in cost are not easily passed to on the consumer and where cost minimization strategies are not delibe- rately pursued as means of reducing total cost, which will in turn improve profitability (Weinberg, 1969).

However, the focus of this paper is achieving profit- ability through effective management of materials with em-phasis on procurement, receipt of materials, holding and carrying costs, inventory control, traffic and management of spare parts.

Objectives and roles of materials management

The classical definition of the objectives of materials ma- nagement is the acquisition of materials and services of the right quality, in the right quantity, at the right price, from the right source and at the right time. Apart from these general objectives, the following under listed points also constitute some of the objectives of materials management:

- To support the company operations with an uninterrup- ted flow of materials and services. This can be achieved through detailed planning of the supply of materials, parts and components so that they are brought together at the right time and in the right work location.

- To keep inventory investment losses (due to deteriora- tion, obsolescence and theft) under control. Also making the most economical use of plant and equipment by smoothing out production processes and scheduling to the best of utilization.

- To buy wisely and competitively which include two dis- tinct considerations: keeping abreast the forces of supply and elements that regulate prices and availability of materials; and a constant search for better values that yield the best combination of competitive buying and wise buying that contributes most to maximizing a company's profit.

- To reduce transportation cost of moving materials by making decisions on route to follow, the means of transportation and the vehicle to use.

- To provide information service for controlling the distri- bution of products, production management, instruction, manufacturing, routes and other background production information.

- To have better control of quality of company's product and to provide required level of customer services. This can be done by maintaining favorable relationship with suppliers' consistency of quality.

The major role of materials manager is for the materials flow of the manufacturing company that includes the pro- duction planning, procurement, storage, production control and distribution;

Planning

This involves preparation of materials budget (what is needed, how much, where and when to fulfill the objec- tive of the organization), product research and develop- ment, value engineering, analysis and standardization of specification.

Procurement

Procurement has to do with determining order quantity, work processing, store requisitions, issue of enquiries, evaluation of quotations, supplier appraisal, negotiations, placing of contracts, progressing of deliveries and clarifying payments.

Storage

Materials manager is responsible for storage location, layout and equipment, mechanical handling, stores clas- sification, coding and cataloguing, receipts of purchased items, inspection of materials, protection of stores, issue of production, provision of cost data, stock records and disposal of obsolete goods.

Production control

This involves forward ordering, arrangement of materials for production, preparation of production schedules and sequences, issue of order to production emergency action to meet material shortages, make or buy deci- sions, quality and reliability, feedback, and adjustment of supplies flow to production lines or sales trends.

Distribution

It includes distribution of the finished goods, warehous- ing, packaging, and assembly, palletizing and shopping to customers.

Transport control

The routing standards, carrier selections, commodity rates consolidation and dispatching shipments. Some- times other non-related areas such as operation of the company store (which sells finished products to the employees at special prices), order entry, and perhaps communication activities are grouped under the jurisdiction of materials management function.

Relationship between materials management department and other departments

Materials Management Department plays a vital role in an organization and it has relationship with other departments. These relationships vary from department to department (Lemu, 2007). The departments that are mostly involved are: Production, Engineering design, Quality control, Marketing, Finance and Personnel department (Zanto, 2008).

Materials management and production department

Materials Management is responsible for the purchase of all materials needed by the production department, and the storage and issuance of these materials. Production department makes requisition to materials management department of the materials needed. Materials manage- ment department raises a local purchase order for such materials (Rihinde, 2005).

Materials management and engineering design department

In order to achieve the major objective of the organization, these two departments should cooperate on matter concerning production design, preparation of spe- cification for the materials, parts and components. They should equally cooperate in the area of value analysis/ engineering and standardization of materials. Materials management may make useful suggestions of substitute materials that may cost less to the engineering department at the production design stage.

Materials management and quality control department

In assurance of product quality, it is very important that the two departments cooperate and relay useful infor- mation to each other. According to Marta (2008) quality control department usually inform materials management on the best method to be applied to incoming materials and also the criteria for acceptance and rejection of mate- rials that are substandard. Quality control can equally advise materials management on condition under which some items should be stored to avoid deterioration in quality.

Materials management and marketing department

Materials management and marketing department should cooperate in ensuring the profitability of the organization. Materials management ability to obtain the right quality materials at the lowest possible cost, will enable marketing maintain competitive advantage. Consequently there will be increased sales and profit. Marketing department is in position to report back to the materials management department on the customers’ reaction to the quality of the product.

Materials management and finance department

Usually, finance department release fund to materials management (if there is no purchasing department or the purchasing unit is under materials management depart- ment) department for purchase of raw materials. Alterna- tively,

payments are made directly to suppliers by the finance department they have been cleared by materials management department. It is the responsibility of the finance department to audit all the necessary documents for purchase made to avoid fraud before payment is made.

Material management and personnel department

Both departments cooperate on matters relating to recruitment, training, motivation, promotion and develop- ment of staff in the materials management department. Personnel department advises materials management department on the company’s personnel policies, wages and fringe benefits. On the other hand, materials management is responsible for the procurement of stationery and office needs of the personnel department.

Achieving profitability through materials management

Effective management of materials contributes a great

deal to achieving business profit. This is done through effecting acquisition, control, handling and movement of materials. The major contributions of materials management to profitability are discussed below:

The decision to make or buy

A manufacturing company should be able to make prudent decision between buying raw materials and pro- ducing them. If this decision is done very well, it can contribute to cost reduction and profitability will increase. According to Ogbadu (2003), many factors have to be considered when arriving at make or buy decision. Factors in favour of buying raw materials include:

- When it is cheaper to do so.
- Quantities required are too small for economic production.
- Spread of financial risk between customers and suppliers.
- When source of supply can no longer be guaranteed.

On the other hand, the decision to produce raw materials can increase profitability when carried out under these circumstances:

- Chance to use up idle capacity and resources.
- Possibility of scrap utilization.
- Greater purchasing power with large orders of a particular material.
- Ability to manage resources

Materials acquisition

Economic buying is the arm of any firm but the cheapest materials may not necessary be qualitative. Therefore, a material manager will strive for the cheapest and qua- litative raw material. Materials acquisition function starts with the receipt of the purchase requisition from the store. The purchase order is therefore prepared based on the contents of the requisition.

The most important thing to bear in mind while planning for profit is to procure the right quality at the right price. Procurement in highly technical areas required skill and experience on the part of the buying manager. Cost improvement is simply the result of learning effect among workers, reflecting the development of skill and dexterity
that occurs when a task is performed repeatedly. According to Ayoade (1986) acquisition circle consists of recognizing defining and describing the need; transmit- ting the need, investigating and selecting the supplier, order, receipt and inspection of good supplied, auditing the invoicing and closing the order.

Consequently, cost of raw materials can be reduced by buying from the right suppliers at the right price without compromising quality.

Receipt of materials

One important aspect of receipt of materials is to check the good supplied and to ensure they conform to speci- fication as contained in the purchasing order. Damaged and sub-standard materials are rejected thereby preven- ting the firm from incurring unnecessary cost and thus promoting profitability. The effect of inferior materials to both the machine and the profitability of the firm must be borne in mind as they cause production held up which may result into substantial losses to the firm.

Material storage

This involves a careful handling of the stock and maintaining of an accurate control over them. Handling of material is one of the activities perform by materials management and can be an effective tool for saving cost and holding up profit. Storage of materials depends on the nature and how they are used in the manufacturing process. Coal and iron ore are usually stored on e ground Liquids. Such as chemicals, paints and oils are kept in tanks. Profits can be achieve if managers effectively manage issues relating to stores location, layout and

equipment inspection, protection of stores, issues to production, stock records and disposal of obsolete (Johnston, 1993).

Storage goes hand in hand with store recording. Good record keeping can detect theft and pilfering early enough. It shows how much materials are in the store and when to place order. The issue of materials from store to production department must be properly authorized and recorded.

Inventory control

Lysons (1996) posits that inventory control enhances profitability by reducing costs associated with storage and handling of materials. Inventory control is means by which materials of the right quality and quantity are made available as when required with due regards to the economy of shortages, ordering cost, purchase price and working capital.

Inventory control determines the extent of stock holding of materials. It equally makes it possible for material manager to carryout accurate and efficient operation of the manufacturing organization through decoupling of individual segment of the total operation and it entails the process of assessing of stock into the store house and the issue of stock.

Materials control has to do with standard control on the ordering size, ordering time, and the quantities of raw materials left in the store at a given time. For pro- fitability and cost reduction, manager must therefore, maintain an optimum level of stock at all time. Too much stock and too little stock must be avoided. According to Buffa and Salin (1987: 100) there are several reasons for keeping inventory. These include protection against variations in demand, maintaining smooth flow of production by providing a decoupling function between stages of production and lowering total material cost by taking advantage of quantity dis- counts. In the same vein, too much stock could result in funds tied down increase in holding cost and the materials suffer deterioration, obsolescence and theft.

On the other hand, shortage of materials can lead to interruption of products for sales; customer relations are hurt, while machines and equipment becomes under utilized. Therefore, a company can only realize substantial savings by using a rational procedure for inventory contro1.

Scrap and surplus disposal

Disposal of scrap and surplus are very important aspect of material management function, and if effec- tively done can contribute to the profitability of the firm. Scrap according to Carter (1982) is the residue of process materials left behind during production while surplus is the materials from purchases which were not wholly consumed in the production. To achieve profitability in disposal of scrap and surplus, it involves decisions in the following areas: return to suppliers, selling to suppliers, selling to other firms, selling to dealers, etc.

Transportation

The traffic section, which is involved in the physical movement of materials throughout the entire production stages, is important for profitability and cost reduction. Materials movement could be in - house or external. The in-house are determined by the nature of the materials by the layout of the factory and by the type of product made. It makes use of such devices as cranes, pipelines, trucks, forklift, etc. one plant to another or from stores at the head office to a plant as well as moving finished goods from suppliers. It involves waterways, pipelines, railroads, trucks, airplane, etc. For profitability it involves decisions ill the following areas. The route, the carrier, methods of shipments and rates schedule.

2. METHODOLOGY

The researcher made use of survey research design. In carrying out this study, the researcher used two sources of data collection methods, namely primary data and secondary data. The target population of this study consists staff of the Benue Brewery Limited. Because of the difficulty in studying the entire accessible population, the researcher used the random sampling technique. The rationality of using this technique was based on equal chance of being selected approach. The sample size from the population was determined using the Yaro Yamen's formular (Kelechi, 2008) as shown below:

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

n = 94

The research questions were analyzed using simple percentages. The hypotheses of the study were stated using chi-square test statistics.

$$X^2 = \frac{(Fo\text{-}Fe)^2}{Fe}$$

3. RESULTS AND DISCUSSION

As stated under methodology, a total of ninety four (94) copies of questionnaires were distributed, out of which eighty-six (86) copies retrieved as correctly filled. The analyses that follow are base don al the retrieved copies of answered questionnaires. Below are the responses to a question: what are the materials management problems in Benue Breweries? (Table 1).

All the respondents agreed that pilfering, sub-standard raw materials, out of stocks, lack of spare parts in the factory and poor relationship with vendors are the major materials management problems in Benue Breweries Limited. On pilfering, the break down of 86 who all agreed shows that 40 out of 86 representing 47% admit- ted that the problem is very significant, 23% agreed that it is moderate, 23% admitted the problem to be of slight extent, and 7% say the problem is not significant at all.

All eighty-six respondents agreed that the receipt of substandard raw materials is a problem of materials management, though they vary in degree attached to this problem. None of the respondents stated it as a very serious problem. 13% stated this moderately significant,
35% stated it is only slightly significant as a problem,
52% stated it is not sufficient at all.

All eighty-six respondents unanimously agreed that, out of stock (finished product) and lack of spare parts are very significant problems in Benue Breweries Limited.

On poor relationship with supplier of spare parts, 93% said it is very significant, 7% stated it is moderately signi- ficant. No percent stated it is slightly significant, the same for no significant.

For the analysis of the research hypothesis, an alpha level of 0.1 will be assumed. We will use chi-square (x2). The degree of freedom (df) is given (r-1) (c-1) where r is the number of rows and c is the number of columns.
Let us consider our null hypothesis:

There is no significant relationship between materials management problems and frequent breakdown of the plant.

This question from the research questionnaire will be used to test the hypothesis. To what extent do materials management problems affect the efficiency of the plant?

Table 1. Materials management problems in Rairu Distilleries.

Response	No. of response	Very significant	%	Moderate	%	Slight extent	%	Not at all	%	Total
Pilfering	86	40	47	20	23	20	23	6	7	100
Sub-standard raw materials	86	0	0	11	13	30	35	45	52	100
Out of Stocks	86	86	100	0	0	0	0	0	0	100
Spare parts	86	86	100	0	0	0	0	0	0	100
Poor Relationship with Vendors	86	80	93	6	7	0	0	0	0	100

Source: Research Data, 2008.

Table 2. Extent of materials management problems on plant efficiency.

Response	Respondents	Percentage
60% and above	50	58
59 - 35%	20	23
35% and below	16	19
Total	86	100

Source: Research Data, 2008.

Table 3. Chi-square computation.

Response	Fo	Fe	Fo - Fe	$(Fo - Fe)^2$	$\frac{(Fo - Fe)^2}{Fe}$
60% and above	50	29	21	441	15.21
59 - 35%	20	29	-9	81	2.79
35% and below	16	29	-13	169	5.83
					23.83

Source: Research Data, 2008.

the efficiency of the plant? (Tables 2 and 3).

Since the computed ×2 (23.83) is higher than the critical value (9.21), we reject the null hypothesis and agree that materials management problem is significantly related to plant breakdown in Benue Breweries Limited.

We identified some of the problems of materials management in Benue Breweries to include pilfering, receipt of substandard raw materials, out of stocks, lack of spare parts, and poor relationships with supplier of spare parts. Ninety-three percent of the respondents say that pilfering is a problem of materials management.

Forty-eight percent of the respondents say that the receipt of substandard materials is a problem of materials management. One hundred percent of the respondents say out of stock and lack of spare parts are problems of materials management.

Our finding shows that the most significant factors for frequent shut down of Benue Breweries Limited is lack of spare parts as a result of poor relationships with suppliers. Consequently, the company is often out of stock. This is affecting probability negatively.

4. CONCLUSION

This paper found out that there is a positive and significant relationship between materials management problems and the frequent breakdown of the plant. This can be expected since the existence of materials management problems result in the breakdown of the plant. Out-of-stock and lack of spare parts hinder profitability.

This paper has shown how profitability can be achieved through effective management of materials with particular attention on sourcing, receiving, storing and issuing materials. Prudent management of materials reduces depreciation, pilferage and wastages while ensuring availability of the materials as at when required. The writer would like to re-emphasize that for a firm to achieve profitability the goal of materials management should be properly carried out. In technical management activities, this goes a long way to affect the profitability of the firm. Given the problem that arises as a result of the inefficiencies, breakdown and shut down of the plant, it becomes very necessary to re-organize the materials management department, establish good relationship with suppliers of spare parts in order to minimize losses arising from frequent breakdown and improve profitability.

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