

MATERIAL MANAGEMNET USING VARIOUS TECHNIQUES OF INDUSTRIAL BUILDING: Case Study (INDUSTRIAL BUILDING)

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Abstract -The average material cost is 55-60 % of total project cost. Hence, efforts should be done taken to reduce material cost. In actual practice most efforts are done to reduce labor cost. Furthermore, effective material management can be instrumental in cost reduction to further extent. The cost, quality & time are important objective of material management. There are various functions of material management. These are the identification with estimation of material requirement, Procurement, Inventory control, storage, disposal of surplus material and scrap. Advance material procurement or delayed both can affect cost, quality and time. So it is very important to get material at right cost, at right quality & right time. This can be achieved by using material management techniques. The A.B.C analysis, VED analysis and SDE analysis are different techniques of material management. These techniques can lead to effective material management in construction projects. A.B.C analysis is based on inventory value of material. VED analysis gives Priority to utility of material whereas SDE analysis gives availability of material in market.

Keywords: Materials Management, VED, ABC, project cost, project management, Inventory management, management techniques, scheduling process.

1. INTRODUCTION

Construction management is a **procurement route** in which the works are constructed by a number of different trade contractors. These trade contractors are contracted to the client but managed by a construction manager. The construction manager acts as an agent for the client, administering and coordinating the works contracts.

Materials constitute a major cost component for any Industry. The total cost of installed material may be 50% or more of the total cost. "Material management is defined as the process to provide right material at right place at right time in right quantity so as to minimize the cost of project". Materials Management is related to planning, procuring, storing and providing the appropriate material of right quality, right quantity at right place in right time so as to co-ordinate and

schedule the production activity in an integrative way for an industrial undertaking. Effective management of materials can reduce these costs and contribute significantly to the success of the project. Inventory' may be defined as usable but idle resource'. If resource is some physical and tangible object such as materials, then it is generally termed as stock. Thus stock or inventory is synonymous terms though inventory has wider implications.

Inventory management deals with the determination of optimal policies and procedures for procurement of commodities. Since it is quite difficult to imagine a real work situation in which the required material will be made available at the point of use instantaneously, hence maintaining, inventories become almost necessary. Thus inventories could be visualized as 'necessary evil'.

Material inventory control and management is simply the process by which an organization is supplied with the goods and services that it needs to achieve its objectives of buying, storing and moving materials. There are usually plenty of materials in a **construction** site.

There are mainly 5 types of inventory control.

1. VED Analysis
2. ABC Analysis
3. FSN Analysis
4. XYZ Analysis
5. SDE Analysis

VED Analysis: -

It attempts to classify the items used into 3 broad categories, namely vital, essential and desirable.

The analysis classifies items on the basis of their criticalities for the industry or company.

Vital: -Vital categories items are those items without which the production activities or any other activity of the company, would come to a halt or at least be drastically affected.

Essential: -Essential items are those items whose stock- out cost is very high for the company.

Desirable:-Desirable items are those items whose stock- out cost or shortage causes only a minor

disruption for a short duration in the production schedule. The cost incurred is very nominal.

ABC Analysis: -

One of the widely used techniques of inventory control is the ABC (Always Better Control) analysis. This analysis is based on the annual consumption of inventory items in a year.

a. Only a small number of inventory items consume a very large share of inventory consumption during the year.

b. A little larger number of inventory items covers a moderate share of annual inventory consumption.

c. A very large number of items just cover a very small share of annual inventory consumption.

These facts gave birth to the concept of ABC analysis. The ABC approach is a means of categorizing inventory items into three classes 'A', 'B' and 'C'.

a. Class A items:

10% of items have 70% of the annual inventory consumption.

b. Class B items:

20% of the items have 20% of annual inventory consumption.

c. Class C items:

70% of the items have only 10% of the annual inventory consumption.

SDE Analysis: -

a. Scarce (S):

Items which are imported and those items which require more than 6 months' lead time.

b. Difficult (D):

Items which require more than a fortnight but less than 6 months' lead time.

c. Easily Available (E):

Items which are easily available; mostly local items, i.e. less than a fortnights' lead time.

This classification helps in reducing the lead time required at least in case of vital items. Ultimately, this will reduce stock-out costs in case of stock-outs.

HML Analysis: -

a. High Cost items (H):

Items whose unit value is very high

b. Medium Cost items (M):

Items whose unit value is of medium value.

c. Low Cost items (L):

Items whose unit value is low.

JIT Analysis: -

Just in Time (JIT) is a production and inventory control system in which materials are purchased and units are

produced only as needed to meet actual customer demand. In just in time manufacturing system inventories are reduced to the minimum and in some cases are zero.

JIT is a philosophy of continuous improvement in which non-value-adding activities (or wastes) are identified and removed for the purposes of reducing cost, improving quality, improving performance, improving delivery and adding flexibility.

1.1 Objectives

1. To determine effective material cost from total project.
2. Quality Assurance
3. Improves efficiency
4. Efficient material planning
5. It ensures continuity of supply
6. Forecast future budget
7. Reduces overall cost of production
8. To apply inventory control technique.

1.2 Scope of the study:

To study material management and its various techniques to figure out the best inventory control system and the suitable and economical material management technique.

2. STUDY OF MATERIAL MANAGEMENT TECHNIQUES

2.1 Introduction

This study considers the importance of material management in building construction site. This study shows the procurement practices and factors affecting material management with respect to time, cost and quality. The reduction of wastage, handling of material, on time material delivery, and tracking technologies are sorted out effectively in a systematic manner. For determining, each of its aspects in detail causes for damage, poor security, preplanning in procurement before facing force majeure. The problems relating to material management are discussed in order to achieve effectiveness in all types of construction projects. The results in this study helps in reducing overall cost and smooth running of the project activities

2.1 Concept of Material Management Techniques

The cost, time & quality are the important objective of material management. Cost is an important parameter of any project. The material availability at right cost is key for economy of project. If material is purchased too early, capital gets tied up as well as interest charges incurred on excess inventory of material. On other hand if material availability at site is delayed it will affect scheduling of activities Time is important parameter of

any project. Material should be available in hand at right time for successful completion of project. Men & machinery become ideal if material is not available on time. Quality is an important factor for any project. An effective material management system can bring following benefits

- Reducing the overall costs of material
- Better handling of material
- Reduction in duplicated orders
- Material is on site when needed and in the quantities required
- Improvements in labor productivity
- Improvements in project schedule
- Quality control
- Better field material control
- Better relations with suppliers

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3. LITERATURE REVIEW

T. Subramantatil (2017)

Authors state that, Inventory management system involves procurement, storage, identification, retrieval, transport and construction methods. Each is indelibly linked to safety, productivity and schedule performance. The main objective of our study is to analyze the inventory management control adopted and the effective utilization of inventory at the construction site. ABC analysis is one of the conventionally used approaches to classify the inventories and the case study of a company is collected. The tracking and locating of materials in construction jobsites has increased a great concern among construction entities. The improper handling and storage of materials in construction site has made it difficult to track and locate materials when the time they are needed. These findings may reflect the main factors that will affect the inventory management system which is able to achieve the improved efficiency of project management and to reduce the waste of materials in the respective region of construction industries. [1]

Prof. Anup Wilfred (2015)

Author describes, If the material management is not properly managed it will create a project cost variance. Project cost can be controlled by taking corrective actions towards the cost variance. Material management deals with principles and practices which effectively optimize cost of materials used in the project. Material management is the line of responsibility which begins with the selection of suppliers and ends when the material is delivered to its point. ABC analysis helps in rationalizing the number of orders and reduces the overall inventory even though overall purchase orders are the same, the average inventory can be reduced substantially.

The Cost Variance values for the Class A materials is a tool to measure the profit and it has a positive value. It indicates the project has a cost under run i.e. the cost incurred is less than the planned or budgeted cost. This S Curve analysis recognizes that there is too much increase in material cost during actual execution. [2]

Prof. Sayali Shet (2016)

The author studied that the average material cost is 55-60 % of total project cost. Hence, efforts should be done to reduce material cost. In actual practice most efforts are done to reduce labor cost. Furthermore, effective material management can be instrumental in cost reduction to further extent. The cost, quality & time are important objectives of material management. There are various functions of material management. These are the identification with estimation of material requirement, Procurement, Inventory control, storage, disposal of surplus material and scrap. Advance material procurement or delayed both can affect cost, quality and time. So it is very important to get material at right cost, at right quality & right time. This can be achieved by using material management techniques. The A.B.C analysis, VED analysis and SDE analysis are different techniques of material management. These techniques can lead to effective material management in construction projects. A.B.C analysis is based on inventory value of material. VED analysis gives Priority to utility of material whereas SDE analysis gives availability of material in market. [3]

T. Phani Madhavi (2013)

The objective of the present study is to understand about all the problems occurring in the company because of improper application of material management. In construction project operation, often there is a project cost variance in terms of the material, equipment's, manpower, subcontractor, overhead cost, and general condition. Material is the main component in construction projects. Therefore, if

the material management is not properly managed it will create a project cost variance. Project cost can be controlled by taking corrective actions towards the cost variance. Therefore, a methodology is used to diagnose and evaluate the procurement process involved in material management and launch a continuous improvement was developed and applied. A thorough study was carried out along with study of cases, surveys and interviews to professionals involved in this area. As a result, a methodology for diagnosis and improvement was proposed and tested in selected projects. The results obtained show that the main problem of procurement is related to schedule delays and lack of specified quality for the project. To prevent this situation, it is often necessary to dedicate important resources like money, personnel, time, etc. To monitor and control the process. A great potential for improvement was detected if state of the art technologies such as, electronic mail, electronic data interchange (EDI), and analysis were applied to the procurement process. These helped to eliminate the root causes for many types of problems that were detected. [4]

Sachin S. Pal (2016)

Materials management is a critical component of the construction industry. As such, organizations need to understand the effects of proper materials management techniques on the effectiveness of project execution. A properly implemented materials management program can achieve the timely flow of materials and equipment to the jobsite, and thus facilitate improved work face planning, increased labor productivity, better schedules, and lower project costs. Materials management is an important function in order to improve productivity in construction projects. It is defined materials management functions which include planning and material take off, vendor evaluation and selection, purchasing, expenditure, shipping, material receiving, warehousing and inventory, and material distribution. In this project we have prepare scheme of material management in The construction industry for building project. Also conducting survey of industry and determine the various format for construction material management also discussing the tracking system of material management in the industry and also discuss the software technology developed for proper management are discuss. [5]

4. Conclusion

This study is expected to have the results of most efficient and economic method of material management. Due detail study of material management and planning the cost of total construction can be reduced and the wastage of material is avoided.

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