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Comparative Study Between Conventional Techniques and Software analysis Of effective material management and inventory control

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***Abstract*:-** 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, 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 material can reduce these costs and contribute significantly to the success of the project.

The concept of inventory management has been one of the many analytical aspects of management. It involves optimization of resources available for holding stock of various materials. Lack of inventory can lead to stock-outs, causing stoppage of production, but a very high inventory on the other hand can result in increased cost of production due to high cost of carrying inventory Primavera software is useful in top level planning and it ideal for managing the complicated details. This a and providing appropriate material of right quality allows planner, project managers, planning controllers and many other experts to have access to the project information in just touch of one button and the software ultimately reduces the time and cost of the project.

Keywords:- material management, stock outs, optimization of resources, inventory management, primavera software

1.INTRODUCTION

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 success of the project. Poor planning and control of materials, lack of materials when needed, poor identification of materials, re-handling and inadequate storage cause losses in labour productivity and overall delays that can indirectly increase total project costs. Effective management of materials can reduce these costs and contribute significantly to the success of the project.

According to zenz (2003) effective material management as a concept which brings together under one manager responsibility for determining the manufacturing requirement scheduling the manufacturing process and procuring storing and dispensing materials. As that, it is concerned with the control activities involved in the acquisition and use of material employed in the production of the finished project.

1.1 Importance of material management

1. The efficient management of materials plays a key role in the successful completion of a project.
2. Management of materials is important for reducing the overall costs of materials.
3. Management of materials is important for Improvements in project schedule.
4. Material management practices could increase efficiency in operations and reduce overall cost of the project.
5. Materials will be available on site when needed and in the adequate quantities required
6. Material management helps to improve the labour productivity
7. The control of materials is a very important and vital subject for every company and should be handled effectively for the successful completion of a project with the help of material planning.
8. Material management helps the companies to increase their efficiency of activities in order to remain competitive and secure future work.
9. Better field material control material management reduce storage of materials on site.
10. Better planning of material helps to reduce wastage of material

1.2 Process of effective material management

In the process of material management material which is needed generated from site. After that indent is generated then whether the material is available or not is checked by supervisors. The vendor who will give the effective cost and quality material is selected from the approved list. Material is ordered from the store after that material is received and inspected. The inspected material is then issued to the department.

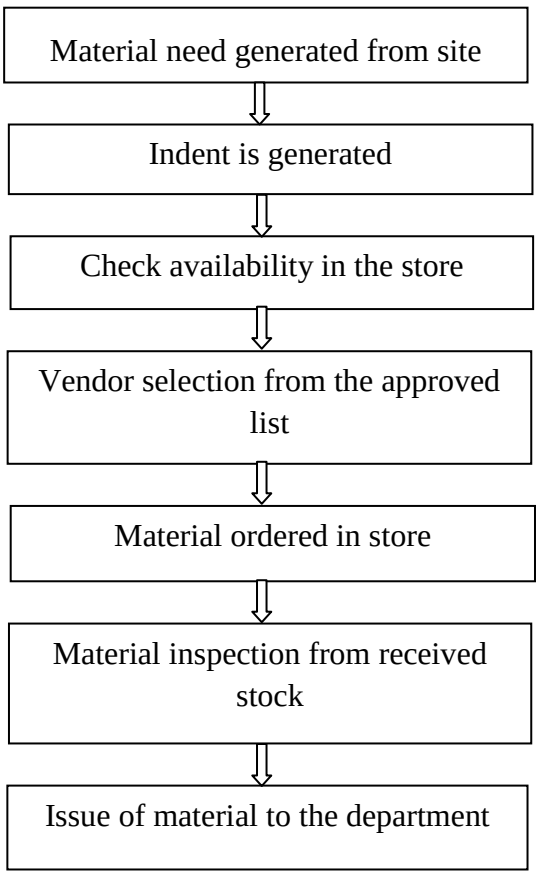

Fig. No.1 Process of Material Management

1.3Inventory control

'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 control can be defined as providing right material at right time in right quantity and at right place so as to avoid disturbance in production of any project. 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 becomes almost necessary. Thus inventories could be visualized as 'necessary evil'.

1.4 Inventory control techniques

i. ABC Analysis
ii. Efficient order quantity (EOQ)
iii. Vital Essential Desirable (VED)
iv. Just In Time (JIT)

C. Primavera software

Primavera is a computer based software used for planning, scheduling, project creation, activity codes, resource analysis and leveling, reporting performance etc. this software is established by Primavera Systems In which provides project and program management software for the Architecture, Engineering and Construction industry.

Primavera software is used to Plan, schedule, and manage the right strategic mix of projects. It is also used in organization to make informed project, cost and resource and in management decisions.

A. Use of primavera software

1. Project Structure
2. Project Creation
3. Work Breakdown Structure
4. Relationship And Constraints
5. Activity Codes
6. Resource Analysis And Levelling
7. Tracking The Project Progress
8. Reporting Performance
9. Precedence Diagramming
10. Representing Project Schedules
11. Resources Optimization Techniques
12. Schedule Compression Techniques
13. Check in & Check out
14. Reflection

B. Methods in Primavera

1. EPS (Enterprise Project Structure)
2. OBS (Organization Breakdown Structure)
3. WBS (Work Breakdown Structure)

2. METHODOLOGY

Finding out the current status of the inventory management in the construction project for getting the basic concept of inventory as well current status regarding the optimization of investment in inventories by using various ways. Study of Application of Inventory Control technique. Analysis is carried out using Primavera software for analyzing planned and actual material consumption through various inventory control techniques. This analysis is carried for comparison of planned and actual cost for material.

From the current status review of literature actual study of inventory management and analysis to give the suggestions and recommendation for the improvement of inventory management. Cost of the project is the factor that usual may lead of the project delayed or uncompleted without the proper planning the construction company may lost a lot of profit from the project and this situation may cause the project cannot finished on the time. The time scheduling also is the major factor that lead to the delayed non completed of the project. Construction company is facing a tough challenge in the time planning of the project because without the proper planning the time factor will cause the loss of the profit to the company.

In our project we are going to collect the estimated data of a constructed building and then by using inventory control

techniques we will go to check whether the estimated cost can be lesser for the structure or building and if yes then how much it will be reduced.

2.1 Scope of the work

Primavera is miraculous tool of project management software. It helps you to plan, supervise, observe and track the product of your company. It is used in all sectors such as IT, Mechanical, Civil, or any type of projects. Primavera is destined for you by planning engineers, planners, and schedulers; it is equally helpful for managers and stakeholders involved in the project. Primavera software tool has helped every sector such as aerospace, manufacturing, transport, engineering, IT, Telecom, Civil and many more.

Primavera software is useful in top level planning and it ideal for managing the complicated details. This allows planner, project managers, planning controllers and many other experts to have access to the project information in just one touch of the button.

1. It involves optimization of resources available for holding stock of various materials.
2. Lack of inventory can lead to stock-outs, causing stoppage of production, but a very high inventory on the other hand can result in increased cost of production due to high cost of carrying inventory.
3. Thus optimization of inventory should ensure that stocks are neither too low nor too high. Inventories like finished products, work-in-progress, components, raw materials, stores, spares, etc. account for 80% or more of working capital in some of the representative industries studied in the past.
4. It would appear that any effort put in towards rationalization of inventories can bring about an appreciable saving. For example, a scientific system of control can reduce investment in inventories considerably, sometimes by as much as 50% or even more.
5. Then the same process will be carried out using the software. Then the results came out will be compared. After comparison we will find out whether the software is effective than the manual techniques. If the software is effective then it can be used for the ongoing project structures and future proposed structures so as to reduce their estimated cost and time.

2.2 Parameters of the software

1. Reduces the jeopardy of slippage of projects.
2. Diminish the menace of project price overrun.
3. It helps to plan and manage the activities of the project.
4. It helps to optimize the project plan, expenses and resource consumption.
5. It gives clear visibility about of what is happening in the plan.
6. You can easily predict costs and other things related to project.
7. It gives you an idea of assignment schedule and information of cost discrepancy.
8. You can keep track of performance of project and can view past performances.
9. Use of Primavera allows enhanced communication between companies. Moreover creating, managing, and understanding of assignment becomes simpler.
10. It helps you breakdown projects and activities without difficulty.

3. CASE STUDY DETAILS

3.1DETAILS OF STUDY AREA

Name of site: Residential Building
Site Location: Karve nagar, near warje bridge, Pune
Site Owner : Mr. Prashant Bhosale
Built up area of site : 2000 sq.ft
Estimated Cost: 78,50,740/-
Parking: No Parking area
Project Duration : - 15 feb started not yet completed

4. RESULTS

Description	Without Material management	With Material management
Total cost of the Project	7850740/-	
Total Cost of Materials(Rs)	3694597/-	3400134/-
% Cost Consumption By Materials.	47.06%	43.30%
Total Cost Of A Project Without Materials(Rs)	4156143/-	
Difference In The Cost(Rs)	385750/-	
% Cost Saved of Materials	3.76%	
Actual construction period of project	Still not completed	
Actual construction duration project by software	203 days	

5. DISCUSSIONS

- From collected data the estimation is studied to find the cost variation. From study it is observed that there is difference between the actual consumed and estimated quantities of materials.
- As the objective of study was to control the cost by implementing ABC analysis has been done by using collected data. For ABC analysis distribution of A,B,C type materials has been done and the actual cost consumed by them is calculated. After calculations the results are interpreted in tabular formats for ABC analysis.

- From the above observations by using software and ABC analysis we have reduced cost of the project by 385750/- Rs and duration of the project not calculated because building is not completed yet. And 3.76 % cost of materials have been saved which ultimately avoids wastage of materials.

6. CONCLUSION

- From the above results and discussions we have concluded that with using the conventional techniques and primavera software there is a reduction in consumption of materials, time period and cost of the project.
- The project which should be completed within the 6 months of period still not completed due to lack of management and planning.
- The total cost of the materials can be saved 3.76% of the estimated cost of the materials and wastage of materials can also be avoided.
- Thus this software is very helpful and vital in any organisation for effective planning and management.

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