A Review Paper on Onsite Material Management for Construction Projects

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Abstract: Effective construction resources management process is a key to success of a construction project. Nowadays, successful material management of construction has to be based on and updated information and processed utilizing a well-designed material management system.

The aim of the thesis is to explore the local practice in construction material management and develop a material management system to facilitate the management of construction material mainly in the building construction. Construction management related literature was generally reviewed; meanwhile some material management techniques have been reviewed also. A survey questionnaire supported by interviews was used to explore the local practice in material management.

The study shows that most of contracting companies are considered the main obstacles in Using computer in material management are shortage of user-friendly computer program and no understanding for importance of computer program. The study clarified that improper cutting of material was one of the most important factors affecting on material waste. The survey also indicated that the stability of the work and work discipline was one of the most important factors affecting on increasing productivity. One of the main recommendations of this research is to encourage local contracting companies to have material management techniques and use it in determining the required quantities of construction materials in order to get resources in time and required quantities save time and minimize error.

Introduction

Effective construction material management process is a key to success of a construction project. Nowadays, successful management of construction materials has to be based on and updated information and processed utilizing a well-designed construction materials management system. The aim of the project is to explore the local practice in construction materials management and develop a construction materials management system to facilitate the management of construction materials mainly in the building construction. A construction project as an entity is an arrangement of material according to some preconceived plan. To effect this specific arrangement, additional material, manpower and equipment are generally required along with some element of time as well as an element of space, a practical sense, each of these elements share a common resource—money. Resulting, construction resources are of five categories with an additional basic resource which are manpower, material, equipment, space, time. The construction industry is one of the most complex industries. The construction process consists of several phases where many different participants are involved during each phase. The uniqueness of this industry is that it is a project-based industry, where each construction project could be considered as a temporary organization. However there is a similarity with other industries as well. The similarity is that all industries are interested in high production efficiency while keeping the overall costs as low as possible.

Public buildings construction is a sector that plays a vital role in our country’s development. Hence, proper and systematic management of this sector should be applied and implemented by the parties involved, particularly the builders or the contractors. Construction covers both small and big projects.

The application and implementation of modern project management methods should be adopted by builders regardless of the size and level of the businesses. Most construction projects are affected by several factors that have a high impact on the efficiency of the workforce by reducing their overall productivity. This affects quality, time and costs of the project. The reason for that is often poor management of materials. Proper material management could increase productivity significantly. These components should be accurately
managed on site, in order for the projects to be successful.

In spite of the growing problem and the implications of poor Construction Material Management, most construction businesses still manage these critical resources and all of the data surrounding them with nothing more than spread sheets, paper forms and human memory. As a result, these organizations are incurring unnecessary costs and taking on risks that are impeding their ability to grow and compete in an industry where there is very little room for error. Over the last two decades, most construction businesses have invested in accounting, payroll, estimating and project management solutions to improve efficiencies and business performance. While essential for success, these applications cannot fully address the complexity of managing a sizable physical material inventory in today’s high-stakes environment. To fully address this complex challenge, companies have been turning to Construction Material Management systems.

**Literature Review**

**Title - Study of material management of techniques on construction project**

**Author – Pande and Sabihuuddin**

This paper highlights the Materials management and techniques. This 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 labour productivity, better schedules, and lower project costs. Materials management is an important function in order to improve productivity in construction projects. In this paper 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. As well as talk over the tracking system of material management in the industry and also discuss the software technology developed for proper management. The total cost of material may be 52% of total cost; so that it is important for contractor to consider that timely availability of material is potential cause of successful completion of project.

**Title- Material Management Techniques on Construction Project**

**Author- Patil and Pataskar**

In this paper stated that the efficient procurement of material represents a key role in the successful completion of the work. Poor planning and control of material, lack of material when needed, poor identification of material, re-handling and inadequate storage cause losses in labour productivity and overall delays that can indirectly increase total project cost. Effective management of materials can reduce these costs. This paper also explore the current practices of Material Management. This study is conducted in two phases, First phase gives the Qualitative information regarding deviation in planned and actual materials in terms of S curve analysis using MSP tool and reasoning over the deviation is essential to know the effect of material planning before execution of project. Various comments on S curve analysis have given in terms of problems of administrative causes, consultant’s causes, contractor’s faults, and unavailability of materials. These major reasons of changes represented in terms of pie chart. To maintain sufficient stock of raw material in period of short supply, to protect inventory against deterioration and control investment in inventories and to keep it in an optimum level an inventory control techniques such as ABC and EOQ analysis is carried out in second phase of study to overcome the problems of stock out.

**Title- Hall Marks in Construction Material Management: A Literature Review**

**Author- Georgekutty and Georgemathew**

In this paper the main hurdles are failure to solve project specific problems. Generally projects taken up for implementation will never complete, in time or complete at a later stage leaving cost and time overrun. The area of construction project planning and construction material procurement, carrying, storage and consumption to the project. This led to the gist of observation and gap identification in certain research areas. Field knowledge, and the on-going construction approach, and observations it is understood that certain areas require close attention as a precaution from project slippage. This give light to the fact that pre-planning and material procurement are equally important in the total project cost. As an after effect of the project delay cost and time overrun will be the end result of every project. This paper an attempt to find a method to control the procurement and carrying cost in construction projects. Based on the motivation for the survey this research has been carried out which is elaborated.

**Title- Inventory Management and Cost Analysis**

**Author- Deepak and Kumar**

This paper focused on construction materials constitutes a large portion of the total cost in construction projects. It may account for 50-60% of the total project cost. Material management includes finding the availability, proper selection,
procurement, inventory management and effective usage of materials at right time. In this inventory management is one of the single largest components to improve the productivity, cost efficient of a project and help to ensure timely completion of the project. On preparing inventory chart and analysing the cost estimate, the proper cost control over material procurement have been achieved to avoid surplus expenditure and better field material control. While considering these activities the inventory chart is more effective. Inventory chart based on activates is basic chart for site engineers and management people to schedule the material procurement and allocate the cost according to it, to avoid surplus expenditure spend for the material.

**Title- Material Management in Construction – A Case Study**

**Author- Madhavi and Mathew**

In this paper study is 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.

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.

**Scope, Methodology, Purpose**

**Scope:-**

a. To study the performance measures used in past and currently in use for material management in construction project.

b. To study the importance of the performance measures in assessing the effectiveness of material management process.

c. Determine the practicality of implementation of performance measures in construction projects.

d. To give suggestive recommendations in order to improve productivity of project.

**Methodology:-**

a. Collection of information related to material management through literature review and preliminary study on site.

b. Study of current material management for onsite construction project.

c. Identify the problems of existing material management by previous data onsite.

d. To give suggestive recommendation from various inventory control techniques for further part of project.

e. Discussion and conclusion of the method which can be suggested for selected case study.

**Purpose of dissertation**

The proposed work will help to establish a stronger research design of resource management for building.

**References**


