

A review on an investigation of effectiveness of construction practices for material management in construction project

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Abstract : For management of a productive and cost efficient site, efficient material management is very essential. Research has shown that construction materials may constitute more than 50% of the total cost for a typical construction project. Therefore the proper management of this single largest component can improve the productivity and cost efficiency of a project and help to ensure its timely completion. One of the major problems in delaying construction projects is poor material management. The material management system attempts to insure that the right quality and quantity of materials are appropriately selected, purchased, delivered and handled on site in a timely manner and at a reasonable cost. This paper contains the study of different literatures containing different techniques methods and problems in construction material management.

Index Terms – Productivity, Efficiency, appropriately.

I. INTRODUCTION

In construction field, there are many techniques and methods which are developed for the management of the material. Research has been done for the proper and effective material management which can lead to minimize the delay, increases in cost of project and wastage of material. By using these management techniques, the material management can be done effectively. It is beneficial to minimize the overall cost of project, time and wastage of material. Although these techniques and methods are available for management of materials, it is observed that in Kolhapur region, the time delay in construction projects are caused due to delays in arrival of materials on site. Also it is found that there is lack of up-to-date information or unavailability of information regarding the status of the order of material. In some cases, materials which arrive on site do not match with the specifications in the purchase order. In that case delay can cause due to searching for the material and this can lead to the increase in total cost of project. Though the techniques are available for effective management, they are not used in actual construction project. It is noticed that most of the time delay in construction and increase in cost of construction project mainly caused due to ineffective material management techniques and methods on construction project.

II. OBJECTIVE-

There are various methods available for effective material management. But still many construction projects are facing the problem related to delay in completion of project or increase in cost of project. So, it is necessary to find out that whether it is because of lack of awareness of material management techniques or limitations in implementation.

III. LITERATURE REVIEW

Uppari Naveen Kumar et.al (2018) in their paper entitled “Construction Material Management on Project Sites” has studied that the material has a dominating role in construction. If the material has controlled dynamically the total project cost would be reduced. The methodology adopted has been validated by a computer program and same is found correct and useful for analysis and controlling any type of projects. This paper has been written to fill a void created by the absence of proper materials management on construction sites. Proper management of this single largest component can improve the productivity and cost efficiency of a project and help ensure its timely completion. One of the major problems in delaying construction projects is poor materials and equipment management. Effective management of materials represents an area great potential for improving productivity of work and also controlling cost.

Nurul Fathira Misron Et al. (2018) in their paper entitled “A Framework of Efficient Material Storage Management on Congested Construction Site” has studied that the emergences of new technologies that are not integrated and have no efficient management methods as well as inexperienced management negatively affect the storage management of overcrowded site sites. Their study aims to devise an efficient set of materials storage management on a congested site. The framework of this study comprises four elements that are defined as workflow of storage management, storage management systems, material storage methods and roles of responsible parties. The combination of the elements can contribute to the strengthening or discovery of the theory or concept that can be used by the developmental growth and future of the industry.

Rathina Kumar Et al. (2018) in their paper entitled “Construction Material Management through Inventory Control Techniques” has studied that materials planning and inventory control as these are the major aspects of material management. S-curve analysis is performed to measure the fluctuation between estimated materials cost and market materials cost. The major reasons for this are identified by interviewing engineers and contractors. Inventory control techniques such as ABC classification as well as EOQ analysis are conducted. Findings: The result of the S-curve analysis show that the actual materials cost is higher than the planned materials cost in most cases. ABC and EOQ analysis are applied to maintain sufficient stock in inventory and any given point of time, to protect the materials in the inventory against damages, to reduce inventory holding costs, to overcome stock-out problems and to maintain the inventory in an optimal level. Sensitivity check is applied to the results of EOQ analysis. The stock-out of A class and B class material problems faced in the construction site can be reduced by the application of ABC classification and BOQ analysis. The total expenditure of inventory is less after the adoption of these simple inventory control techniques. Conclusion: Instead of using costly software for inventory management, the engineers and contractors may use these simple inventory control techniques which are equally beneficial and economical.

M M Rahman Et al. (2017) in their paper entitled “Causes of shortage and delay in material supply: a preliminary study” has studied that the outcomes of a study that targeted identifying causes of shortage and delay in materials supply in Brunei Darussalam. The study was conducted through fifteen semi-structured interviews of contractors and materials suppliers in Brunei. The study identified six causes of shortage of materials and nine causes of delay in materials supply in Brunei. The most important cause for shortage of materials relates to the origin or availability of construction materials. On the other hand, the most influential cause of delay in material supply was found to be poor materials procurement and inventory management system, which has other underlying reasons such as late identification of the type of materials needed. The observations are expected to help in formulating or reviewing relevant policies, in order to ensure on-time project delivery.

Ahmad Zeb Et al. (2017) in their paper entitled “Inventory Analysis of Construction Industry” has studied that construction industry involves multi echelon supply chain. With so many stake holders involved, the inventory management becomes a critical aspect of construction project management. Construction industry faces a lot of problem due to poor inventory management, these projects over run the time and the allocated budget. ABC analysis is one of the preliminary inventory assessment methods but it is still alien to Pakistan construction environment. The paper focuses on the importance and economic benefit of inventory management for construction practitioners.

Aynur Kazaz Et al. (2016) in their paper entitled “Construction materials-based methodology for time-cost-quality trade-off problems” has studied that Time, cost, and quality (TCQ) as a triple constraint of construction projects have dependent and conflicting objectives. In these models, two different approaches were used to estimate TCQ-related data. In the continuous approach, it was assumed that the relationship among these three components could be expressed by continuous functions. In the discrete approach, it was accepted that (i) the construction method, (ii) the crew formation, and (iii) the crew overtime policy have some impacts on the project TCQ and that the relationships among these three components become discrete. In this context, some simple projects including a limited number of activities were used to evaluate the applicability of the developed models. Therefore, in this study, it is aimed to outline a new two-step methodology, including the alternative construction material utilization, for TCQ tradeoff problems, especially for building projects which enable the utilization of the high variety of construction materials. For this purpose, the impact of construction materials on TCQ of a project was explained in a detailed manner.

Ashok Patare et.al (2016) in their paper entitled “Comparative Study of Conventional Material Management with Advanced SAP Technique” has studied that Material 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, storage, and movement of material, Efficient material management is very essential. The construction materials may constitute more than 60% of the total cost for a typical construction project so that effective and proper material management can be proved very cost effective. The materials requirements planning, purchasing, inventory planning, storage, inventory control, materials supply, transportation and materials handling are the activities of material management. Material management is made problematic by material shortage, delays in supply, wastage and lack of storing place. Proper material management can improve the productivity and cost efficiency of a project and help to ensure its timely completion. The material management system attempts to insure that the right quality and quantity of materials are appropriately selected, purchased, delivered and handled on site in a timely manner and at a reasonable cost. This paper contains the different methods used by the construction companies and also describes the main results of survey carried out in Pune in different construction companies for their current material management process.

Aditya Pande S. et.al (2015) in their paper entitled “Study of material management techniques on construction project” has studied that 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. 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 . As well as talk over the tracking system of material management in the industry and also discuss the software technology developed for proper management.

IV. RESULT AND CONCLUSION

The above literature has suggested different techniques, methods and software for effective material management that can help to minimize the total cost of project, time and also wastage of material. But they have not studied whether these techniques are actually implemented or not or problems behind implementing these techniques.

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