



**Article Title: Assessment of Impact on Project Cost and Schedule Due to Material Mismanagement in Trivandrum**

## **Assessment of Impact on Project Cost and Schedule Due to Material Mismanagement in Trivandrum**

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### **ABSTRACT**

The paper aims to fill a void created by the absence of proper materials management on construction sites. Research has shown that construction materials accounts for 50-60% of the total cost in construction projects. For a productive and cost efficiency, material management is very essential. Material mismanagement decrease the contractor's profit leading to huge losses, and leaving the project in big troubles, therefore the proper management of this single largest component can improve the productivity and cost efficiency of a project and help ensure its timely completion. The existing construction material management practices of contracting companies are investigated in this paper. The study was exclusively assessed through questionnaire survey, interviews, field visits and discussion with the concerned authorities. 26 factors were selected for the proper assessment of most critical factors.

The population for this research was all ongoing building construction project sites in Trivandrum and purposive sampling techniques were used. To achieve these research objectives questionnaire survey and interviews were used to collect relevant data from contractors, consultants and client representatives on-site. A total of 45 valid questionnaire survey was returned 31(83.78%) from contractors, 9(81.82%) from consultants and 5(62.50%) from clients. So that, based on the respondent's agreement the relative importance index (RII) value and percentage were used to rank and explain their agreement by using Microsoft excel.

**Keywords:** Inventory control, Cost overrun, Quality issues

## **1 Introduction**

### **1.1 Background**

The construction industry plays an important role in the social, economic & political development of a country. However, according to a study done by Semere (2006), the Construction industry is not only one of the major sectors of an economy but it is also the largest and accounts from 12% to 25% of the GNP of both developed & developing countries. Also, this study concludes that the construction industry consumes a higher percentage of the annual budget of a country. Specifically, in our country India, it covers 58%



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of the annual budget. However, the construction industry in developing countries failed to meet the expectations of governments, clients, and society as a whole (Jekale, 2004). Although in India construction industry shares many of the problems and challenges the industry is facing other developing countries, perhaps with greater severity. Among those challenges and problems, poor resource management takes a major part. According to Balaji & Venugopal (2017) investigation, in recent days: -

- 20% of construction industries were practicing effective resource management systems along with proper planning and scheduling.
- 5%-10% of construction industries were aware of it but they are not adopting it during practice on consideration of the uncertainties.
- The remaining construction companies execute unplanned systems only with their experience or simply by directions for top-level management.

### **1.2 Significance of the study**

This research focuses on the assessment of the impact of poor construction material management on building construction project cost and time. Hence, understanding these factors which affect construction material management and existing construction material management techniques is helpful for the construction professionals who work on the initial phases of construction planning to efficiently deliver the project plan.

The findings from this research will serve as a guideline to the Trivandrum construction contractors to improve construction material management. The main goal of the study is to provide essential information about the impact of construction material management on the cost and time of building construction for the project contractors who enable to project's success. Also, that will minimize certain loss of profits, build a good relationship of stakeholders and project will not affect and construct building will rich for its purpose.

## **2 Objective**

The specific objectives of this study are: -

1. To assess the existing construction material management technique on building construction projects in Trivandrum.
2. To assess the challenges facing contractors in the implementation of construction material management on building construction projects in Trivandrum.
3. To identify the impact of factors affecting construction material management on building construction project cost and time in Trivandrum.
4. To measure the impact of poor construction material management on building cost and time in Trivandrum.



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### 3 Methodology

#### 3.1 Sampling Method

This study adopted purposive sampling techniques which were used to select the respondents. Because the selected sample was aimed at the respondents who have an information-rich on the subject & to meet the objective of the study. Special in some building construction projects construction material management techniques is not implemented. The selection of respondents were all ongoing building construction project sites which were constructed by a different grade of contractors, consultants, and owners recently in Trivandrum. A total of 37 questionnaires was distributed to the contractor's representative and 8 questionnaires were distributed to clients of selected projects. Also, 11 questionnaires were distributed to consultants to assess the insights of consultants. Generally, a total of 56 questionnaires were distributed for the three parties who were and are still engaged in building construction projects in Trivandrum.

#### 3.2 Pilot study of questionnaire

In this research, the following problems were identified in the questionnaires: -

- There are redundant or the same concept of request to fill. Example- Shortage of qualified persons
- Other repetition of the sentence in the questionnaire.
- And there are few technical defects, such as punctuations, missing letters, etc. like- Taking off error



**Figure 1:** *Distribution of type organization who filled the questionnaire*

### 4 Results and Discussions

#### 4.1 Impact of material mismanagement

1. Cost overruns: Inadequate material planning and procurement can lead to unexpected cost overruns due to rush orders, premium pricing for urgent deliveries, and wastage of materials.



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2. Project delays: Material shortages or incorrect deliveries can cause delays in construction timelines, leading to extended project durations and potential contractual penalties.
3. Reduced productivity: When workers don't have the required materials at the right time, their productivity can suffer, leading to inefficiencies and increased labor costs.
4. Rework and waste: Mismanagement of materials may result in errors, leading to rework and additional waste, adding to project expenses.
5. Safety hazards: Incorrectly handled or stored materials can pose safety risks on construction sites, potentially leading to accidents and injuries.
6. Quality issues: The use of substandard or incorrect materials due to mismanagement can compromise the quality of the final construction, resulting in potential defects and maintenance problems.
7. Damaged reputation: Construction projects that suffer from frequent material-related issues can damage the reputation of construction companies, affecting their ability to secure future contracts.
8. Disputes and legal issues: Material mismanagement can lead to disputes with suppliers, contractors, or clients, resulting in potential legal challenges and contractual disputes.
9. Cash flow problems: Inefficient material management can tie up capital in excess inventory or lead to delays in project payments, affecting the cash flow of the construction company.
10. Loss of competitive advantage: Construction firms that consistently face material mismanagement issues may lose their competitive edge to competitors who can deliver projects more efficiently.
11. Impact on sustainability goals: Inefficient use of materials can lead to increased environmental impact, as it may result in more waste generation and higher resource consumption.
12. Project abandonment: In extreme cases, severe material mismanagement can lead to project abandonment if the costs become unsustainable or financial resources are depleted.

## **5 Conclusion and Recommendation**

### **5.1 Conclusion**

In conclusion, material mismanagement can have far-reaching and detrimental effects on businesses and projects across various industries, including construction. The consequences of poor material planning, procurement, handling, and utilization can manifest in increased costs, project delays, compromised quality, safety hazards, and damaged reputations.

Cost overruns and production delays can erode profitability and hinder timely project completion, leading to dissatisfied customers and potential legal issues. Moreover, inefficient material management can result in wastage, rework, and safety hazards, negatively impacting the overall project efficiency and worker productivity.



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Furthermore, material mismanagement can strain supplier relationships, affect cash flow, and hamper a company's ability to compete effectively in the market. It can also impede progress toward sustainability goals, as it may contribute to excessive waste generation and environmental impact.

To mitigate the adverse impacts of material mismanagement, organizations should prioritize effective material planning, inventory control, and supply chain management. Embracing technology, implementing robust construction management systems, and fostering strong supplier collaborations can improve material tracking, minimize waste, and enhance overall project performance.

By recognizing the significance of efficient material management and proactively implementing strategies to address any mismanagement issues, businesses can position themselves for success, improved customer satisfaction, and sustained growth in a competitive marketplace.

## 5.2 Recommendation

### A. Recommendation for owners

Other stakeholders affected by construction material management are the owners of the building constructed. Therefore, it is recommended to owners: - Pay progress payment to the contractors on time as it is a high impact on construction material management and providing of clear and brief explanation by the client before the designing stage to minimize design change.

### B. Recommendation for consultants

It recommended for consultants: - Reducing design changes by proper feasibility study before the design stage, Make the effective involvement of all parties during the design stage and should be supervised the construction material storing method in a construction site.

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