

ABSTRACT

The purpose of this research is to assess causes and effects of cost and time overruns in construction projects. This study is descriptive, designed to obtain views from, consulting firms, regulatory boards and construction firms in regard to causes and effects of cost and time overruns in construction projects in India. The main aim of this paper is to identify the major reasons for cost overruns in construction projects in India as well as the critical success factors that are helping to avoid the cost overruns. For this, the existing literature is reviewed and critical success factors are identified. Based on them, survey questions and interview questions are prepared. The findings supported the proposed hypothesis, i.e., lack of certain critical success factors leads to cost overruns in construction projects in India. They also confirmed the proposed proactive and reactive strategies of some researchers. The effective critical success factors include appropriate planning in the initial stages, skills of contractors and architects, good relationship and regular coordination among client and contractor, and early contribution of contractor with the project. The ideal methods that help to reduce cost overruns include efficient planning, proper management of site and supervision of the project, suitable planning and arrangement of project, proper methods for construction, regular meetings on development of the project, and hiring proficient subcontractors and suppliers

KEYWORDS: construction time and cost overrun, causes and questionier.

I. INTRODUCTION

The Construction industry is considered to be the economic backbone of all countries. It is one of the sectors that provide development of economy. Due to poor cost and time management these days, the construction industry is facing a huge amount of cost overrun. Poor cost management and overrun are huge problem and very serious issue when it comes to project cost in both developed and emerging countries. The increasing complexity of infrastructure projects and the environment within which they are constructed place greater demand on construction managers to deliver projects on time, within the planned budget and with high quality. It is known fact that a larger number of projects in India have been delayed due to various issues. This industry plays a paramount role in the economic growth of our country. Today, India is one of the leading outsourcing hubs in the world. Hence, it is important to identify the factors that contribute to cost and time overrun that could be used to systematically address the causal factors to avoid and reduce the problems.

The aim of the study is to establish significant causes of cost overruns and schedule overruns that could be used to systematically address the causal factors.

Indian construction sector

India has an estimated urban housing shortage of 18.8 Million dwelling units. The housing shortage in rural India is estimated at 47.4 Million units, in 2012.

Present levels of urban infrastructure are inadequate to meet the demands of the existing urban population. There is need for re-generation of urban areas in existing cities and the creation of new, inclusive smart cities to meet the demands of increasing population and migration from rural to urban areas. Future cities of India will require smart real estate and urban infrastructure.

The Government of India is in the process of launching a new urban development mission. This will help develop 500 cities, which include cities with a population of more than 100,000 and some cities of religious and tourist importance. These cities will be supported and encouraged to harness private capital and expertise through Public Private Partnerships (PPPs), to holster their infrastructure and services in the next 10 years.

To provide quality urban services on a sustainable basis in Indian cities, the need of the hour is that urban local bodies (ULBs) enter into partnership agreements with foreign players, either through joint ventures, private sector partners or through other models.

II. LITERATURE REVIEW

- T.Subramani, P S Sruthi, M.Kavitha (2014), “Causes of Cost Overrun in Construction” The industry plays a pivotal role in developing the country’s infrastructure, a pre-requisite for high levels of economic growth. Most construction projects experience cost overrun and it put massive financial burden on the client or owner. Therefore this research was carried out to identify the causes leading to cost overrun in construction projects. Desk study along with questionnaire survey was used to identify the causes of cost overrun. A total of 30 filled questionnaires were collected from clients, consultants and contractors. From the analysis of the results it was found that consensus of opinion exists between respondents on the causes of cost overrun. The results showed that, slow decision making, poor schedule management, increase in material/machine prices, poor contract management, poor design/ delay in providing design, rework due to wrong work, problems in land acquisition, wrong estimation/ estimation method, and long period between design and time of bidding/tendering are the major causes of cost overrun.
- Sai Murali Krishna Reddy. Raya and S.S Bhanu Prakash (2016), “Cost and Time Overrun in Indian Construction Industry” A lot of research and studies have been done to identify the root cause of the time overrun and cost overrun in construction projects which lead to the delay in the project completion Time and cost are the lifelines of any and every project. It is of supreme importance to study, analyse and evaluate the common factors leading to these constraints and suggest the best mitigation measures to overcome time and cost overrun constraints. During the construction phase it is the prime responsibility of the project managers to monitor cost and time and avoid the overruns of the both cost and time. Due to these limitations, this paper discusses the effective cost and time control overrun practices in construction industry.
- Ram Singh(2009), “Delays and Cost Overruns in Infrastructure Projects: An Enquiry into Extents, Causes and Remedies” Ram Singh say media reports abound on instances of prolonged delays and excessive cost overruns in infrastructure projects. Only a small number of projects get delivered in time and within the budget. Examples of successful project implementation, like construction of the Delhi Metro Rail, are few and appear only far in between. Indeed, the problem of time and cost overruns in India is widespread and severe. Yet, very few empirical studies exist on the subject. Even rarer are the studies based on completed projects. As a result, the extents as well as the causes behind delays and cost overruns have remained under researched. This study investigates the various issues related to delays and cost overruns in publically funded infrastructure projects.

III. CAUSES OF TIME AND COST OVERRUN

Causes of Time Overrun

There are many factors which contribute to delay of a construction project:

- a) **Contractor Contributed Factors.**
 - Conflicts in sub-contractor’s schedule during execution.
 - Ineffective & inadequate early planning and scheduling of project.
 - Implementing improper & obsolete construction methods.
 - Inadequate contractor's work & experience & also poor risk management and ignorance.
 - Often changing project schedule.
- b) **Consultant Contributed Factors**
 - Delay in approving overall designs, shop drawing, sample tested materials and major changes in the work.
 - Delaying in performing site inspection & testing.

c) Owner Contributed Factors

- Delay in decision-making process.
- Owners lack of experience and involvement.
- Delay in progress payments.
- Delay in revising and approving design documents.

Causes of Cost overrun

a) Design Change during Construction Phase

There are many changes from the client e.g. Change in specification, change in scope of work. Many times decisions are pending which cause delay in the project.

b) Contractors financial stability

As in initial phase contractor has to put money on his own, it is very important that the contractor is financially stable. In many cases contractor engages his money in various projects which leads to delay in project time and future cost.

c) Error in cost estimation

If the cost estimated in the initial phase is not done properly then eventually the project will have financial problems from both the contractor and the client which will lead to cost overrun and also time overrun.

d) Payment delay

Slow or delayed payment to contractors for completed works is a very common complaint of contractors about project's client. Failure to provide payment on time to contractors for the completed work will make it difficult for the contractors to meet project objectives. Moreover, payment delay by the owner might lead to an increase in the cost of projects as contractors increase their overhead cost to cover that risks.

e) Poor management of material.

The importance of material management can be seen clearly from its definition. Patel and Vyas [38] define materials management as "the system for planning and controlling all of the efforts necessary to ensure that the correct quality and quantity of materials are properly specified in a timely manner, are obtained at a reasonable cost and most importantly are available at the point of use when required". Material price fluctuation and poor material management have been recognized as one of the main causes of cost overrun. Different causes could lead to poor material management such as: unreliable material suppliers, shortages of materials, an absence of adequate statistics on materials availability; fluctuations in the availability of construction materials; very long average waiting times and uncertainty about the deliveries of ordered materials; shortages of funds to procure materials, and inadequacy in terms of transportation.

IV. DATA COLLECTION & ANALYSIS

Questionnaire was developed to obtain information about causes of cost overrun in construction industry; it was asked to rate those initially identified factors according to their severity. Factors considered for questionnaire survey is as below.

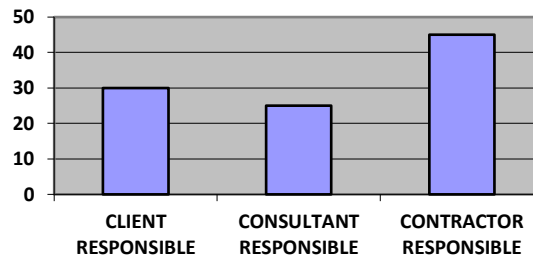
Related to time overrun-

1. Contractor responsible
2. Client responsible
3. Consultant responsible

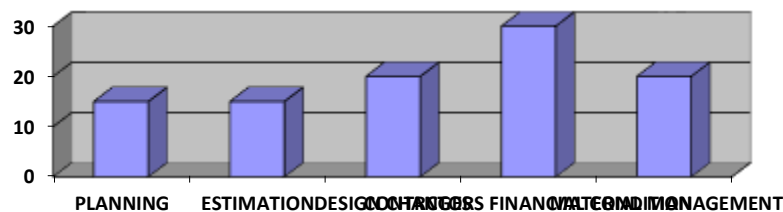
Related to cost overrun

1. Poor planning
2. Poor estimation
3. Design changes during construction
4. Contractor's financial stability.
5. Poor material management.

The questions were asked to 30 people from different agencies involved in the construction industry. The response was as follows.



Response for time overrun



Response for cost overrun

Data received from the survey is analysed using following formula.

$$\text{Average Rating} = \frac{X_1 + X_2 + X_3 + \dots + X_n}{N}$$

Where, X_1, X_2, X_3, X_n - Rating given to factor mentioned

N - Number of projects

V. CONCLUSION

Delay and cost overrun of slow closeout can be avoided when the project closure phase is implemented as planned.

- Completion: Ensure that the project is 100% completed to avoid disputes and delay in payments.
- Documentation: Detail documentation will ensure that future changes are made with little extraordinary effort.
- Project system closure: this includes closing the financial system i.e. all payments, work termination, etc.
- Project review: this can help in transfer of tangible knowledge of time and cost, know-how and know-why.
- Disband project team members and complement achievement as soon as possible to avoid cost overrun due to extra overhead.
- Stakeholder satisfaction: provide all the necessary information required by stakeholders to avoid conflicts and doubt. "This information can include a timeline showing the progress of the project from the beginning until the end, the milestones that were met or missed, the problems encountered and a brief financial presentation".
- Material prices and labour rates should be updated continuously.
- Constantly track and measure the progress
- Sufficient time should be given for preparing feasibility studies, planning, design, information documentation and tender submission. This helps avoiding or minimizing late changes.
- More communication and coordination between project participants during all project phases.
- Top management must react positively to political and environmental changes by means of managerial and financial policies.

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In conclusion, although delay and cost overrun may seem very inherent in most projects, the good news is that it can be reduced or totally eliminated using a proper project performance monitoring and control system that will integrate all the key activities of each phase of the project. This system could be designed such that a close loop information feedback and feed forward package is obtained from definition to close out of the project. The cycle is usually advantageous because planning, measuring, monitoring, and taking corrective action are all usually included in the control cycle. Other additional tactics used to achieving a project with little or no delay and cost overrun is in the definition of project success factors and criteria. The integration of these factors will lead to a better understanding of the issues in which the project manager needs to address and design a control system that will monitor these issues. The project owner and the project manager should be able to clearly define the management success and product success so that the project team has clear knowledge of its objectives.

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