International Journal of Futuristic Trends in Engineering and Technology
ISSN: 2348-5264 (Print), ISSN: 2348-4071 (Online)
Vol. 3 (05), 2016

Review on an Unfortunate Fact in Construction Industries: Time and Cost Overrun

(Paper ID: 35ET3004201620)

Dr. S. K. Dave
Head Civil Engineering Dept.,
B&B Institute of Technology,
V. V. Nagar, Gujarat, India.
drskdave@gmail.com

Gunjankumar S. Shah
Final year ME student, Construction Engg. & Management,
Birla Vishwakarma Mahavidyalaya,
V. V. Nagar, Gujarat, India
937gunjan@gmaul.com

Abstract: The Indian construction industry is an essential part of country's economy and growth of India's development investment. Construction industry generates extensive employment and play a vigorous role in socioeconomic development of country. The issue of time overrun and cost overrun is a global challenge in construction industry. Time overrun is an unexpected delay in construction project due to unavailability of adequate resources and other administrative problems. Similarly, cost overrun which involves astonishing cost incurred in excess of budgeted amounts due to under estimation of the actual project cost during planning of project. This paper glances over the panoramic study of time and cost overrun in the construction industries. Which include a critical literature review of paper based on Indian context.

Keywords: Construction Performance, Cost Overrun, Time overruns

I. INTRODUCTION

In Indian construction industry plays a vigorous role in economic development. 5-6% of gross domestic production (GDP) is contributed by construction industry only and also a second largest industry after agriculture. More than 3 crores people were employed by construction industry only. In infrastructure, Five Year Plan Period from 2012 to 2017 around amount of 55, 74,663 crores are to be invested. For any project to be delivered successfully the topmost criteria are completing projects on time, within the estimated cost and the quality standard should be gratified.

The most intricate and one of the dynamic industry is construction industry which is full of uncertainties incorporated. This industry is continuously facing the globally concerned issue of time overrun and cost overrun during the construction process. The time required to complete the project work beyond the contract time can be defined as time overrun. It often leads to disorder in workflow, budget overrun, and contractual claims and reduces the productivity. The difference in cost between the final cost of a construction project at completion and the contract amount, agreed among the owner and the contractor during the contract is defined as cost overrun. Cost overrun can occur due to wide range of causes depending on the type of project. It is most numerous phenomenal problems in many construction projects. This paper emphasis on panoramic study of time and cost overrun.

II. OBJECTIVES

The main objectives of the present paper are as follows:

1. To investigate the increasing frequency of cost overruns and time delays on construction projects and thus provide recommendations for addressing the situation.
2. Identify the distribution and trends of the cost overruns and time delays in construction industries.
3. Investigate the reasons and the responsibilities for cost overruns and time delays by collecting and reviewing the data

III. CRITICAL LITERATURE REVIEW

Ram Singh (2010) studied 894 projects from 17 infrastructure sectors on time and cost overruns in publicly-funded infrastructure projects. Findings were emerged from the econometric analysis of the Ministry of Statistics and Programs Implementation (MOSPI) data. Raut et al. (2013) discussed traditional project monitoring practice in construction industry and proposes some guideline for improving cost management in fast, complex and uncertain construction projects. The integrated application of Average Index formula and S-curves were analysis by questionnaire survey conducted on various construction sectors. As per research cost was given more weightage rather than time and quality. Subramani et al. (2014) identified the causes leading to cost overrun in construction projects and its enormous financial effects on the client or owner. 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 were the major causes of cost overrun. Chavan et al. (2015) studied the parameters that affect the cost of the road project and suggested regression analysis technique. Judged the

influence on cost by evaluating the parameters. Conflict among project participants was the most cost influencing parameter. Maheshwari et al. (2015) stated the major time overrun factors and analyze in public private projects of India. Also fuzzy logic model were prepared in order to analyze the factors causing time overruns using Fuzzy toolbox. Mulla et al. (2015) emphasized on three indicators time, cost and quality. The study was limited to a sample interview for seventeen projects, which were real-estate projects. As stated in research poor planning, implementation and management were the main reasons for time and cost overruns in construction projects in India. Tejale et al. (2015) established 45 common factors for cost overruns from literature review and discussion with experts. The factors were related with Owner, Contractor, Consultant, and Management, Material, Equipment and Labor. Material shortage, Shortage of labor and late delivery of materials and equipment were the most significant reason for cost overrun. Raykar et al. (2016) established critical factors influencing time overrun and cost overrun in the performance of construction project. According to this the factors which influencing time and cost overrun were poor site management and supervision, problems with sub-contractors, inadequate planning and scheduling of project, problem associated with material management and lack of coordination among stakeholders. Also some factors introduced which affects the time and cost overrun at some extend were bad weather, scope of work, equipment cost and usage, cash flow management and decision making policy.

Table 1. Reasons for Cost Time Overruns

STAGES	EXTERNAL ISSUES	INTERNAL ISSUES
Pre planning stage	Delay in regulatory approvals unavailability/delayed availability of funds, Land/site handover	Lack of project managers/commercial managers with adequate planning skills, Lack of liaison 0fficer/planning engineer , Lack of cost managers Lack of Safety officers/environmental practitioners
Planning and design stage	Lack of strong R & R policies ineffective procurement planning Design/scope change Delay in regulatory approvals delay in decision making	Lack of planning engineer/commercial managers Lack of liaison officer or planning engineer Lack of knowledge
Execution stage	Weak/ineffective project planning & monitoring Contractual disputes unavailability/delayed availability of funds Lack of strong R&R policies Delay land/site handover	Lack of project managers/site managers/planning engineers/quantity supervisors Lack of awareness modern equipment & technology
Closure and handover stage	Pre-commissioning teething troubles Contractual disputes	Lack of commissioning project and site managers audit and total quality management professionals

IV. Recommendations to Minimize Time and Cost Over-Runs

The time and cost overrun and its control is extremely vast and complicated subject which requires in-depth studies. A sound knowledge of other specialized subjects like Financial Management, Risks Management, Project Management and others also required. It is tough to suggest any solution to minimize the overruns.

"However, the clues for the remedial steps provided by some previous analysis of the reasons for time and cost overruns. These can be listed as follows:"

A) Primary Action:

"There may be many clearances necessary from various government agencies even after the government approval of the project, in order to save time, there may be one or more Empowered Committees needed to be established. Such committees set up were successful in minimizing time and cost over-runs.

B) Assurance of Funds Resources:

"After approval of project and 'go ahead' is given, there should be sufficient funds should be needed to meet the requirements (both for the project and for the internal activities). Year-wise requirement of funds is advisable to determine for better performance of project which reduce the threat of time and cost overrun. Similarly, requirement for materials year-wise is advantageous for completion the project within time and estimated cost."

C) Better Formulation and Appraisal of Projects:

"Only after full investigation decision of Investment on a project should be undertaken, collection of data, analysis and representation of the concept. Since in many projects, this analysis may be expensive and may require preparation of the detailed project report, to eliminate those project ideas which are prima-facie not viable the fast stage clearance should be used. For checking the data, questioning under-estimates and unrealistic assumptions the appraisal system needs to be made more effective."

D) Better Contract Management:

"Since in most of the major projects, execution of project is through contracts, their key to minimize time and cost over-runs is proper management. The resource-based implementation planning of the projects linked closely with contract planning (both for equipment supplies and works). Suppliers and Contractors should be assured to give their resource according to time plans integrated with project plans (based on PERT/ CPM) and follow them. Delay in supply should be punishable in terms of payment."

E) Better Management Techniques, Systems, Incentives:

"For reducing time duration of activities and giving up of unnecessary items/activities Industrial engineering and

management techniques such as method study, value engineering, etc., can help in. Over-specification can be avoided so that the costs can be reduced. The project organization should be distinct, separate from operation side, complete with all functions, under the charge of one competent project leader and with all responsibilities clearly defined."

F) Monitoring and Implementation of Planning Should be Sound:

"Monitoring is the most important parameter which influence the cost and time of project. No matter how good the design is, if proper monitoring is not maintain. Monitoring is directly influencing to time and cost."

V. Key Suggestions for the Stakeholders Involved in Construction

Based on the research work carried out by KPMG in India below are few suggestions that can be addressed by project owners to help rule out key concern:
Exhaustive risk identification at the planning stage most companies don't conduct detailed risk assessment at the planning stage. Each project has some specific risks related to the surrounding environment. Contractors and local stake holders that could impact project completion. Thus there is need to do a very detailed analysis of all possible risks. Further the risks need to be formally documented and monitored at each stage of project execution.

A) Holistic view of regulatory approvals

Majority of projects faced hindrances in getting statutory approvals. There is a need to include approvals process and timelines in the project plan with specific timelines. Any deviation in achieving these timelines should have a suitable Mitigation plans for timely completion of project. Further, from government side there is a need to make approval and clearance processes smooth by introducing innovative measures such as single window clearance.

B) Develop Integrated Project Delivery Schedule

Most projects are being executed by split package model in which multiple contractors are carrying out different scope. Further each contractor submitted its own schedule which is generally not integrated to make a single project schedule. The monitoring is carried out based on individual schedules. In this system if one contractor is delaying, the effect will not be seen on activities of other contractors. Thus, to monitor the project with multiple contractors, it is very important to have one a single integrated project schedule encompassing the scope of all contractors. Additionally, this schedule has to be updated frequently to monitor overall project status.

C) Build power partnership with vendors

Delay in getting equipment from suppliers/contractors is another reason which impacts the project delivery. Building a long term relationship with vendors could help in timely delivery of equipment. Further, joint evaluation of project by project owners and the contractors, can help in identifying the bottlenecks and taking corrective actions.

D) Enhance monitoring agency (PMO) to monitor the progress and bottlenecks on regular basis

Most companies have an in-house system of monitoring project progress. However, setting up a centralized independent monitoring agency (PMO) could help in monitoring the project progress and identifying bottlenecks in an efficient manner. Further, this would act as an interface between project site and corporate office enhancing the project delivery.

E) Buy-in from execution team on project schedule

The project schedule is often prepared by the corporate office and given to the project team for execution. The schedule is not prepared by taking in to confidence all the executing agencies such as engineering, procurement and execution teams. This creates issues around accountability of the timelines given in the schedule. The project schedule has to be signed off by all agencies after agreeing to the timelines given for their activities

VI. Conclusion

After doing the studies it is clear that the problem of time and cost overrun is not bound to any particular type or size of project, neither has it had any limitations for the location or region. More or less alike problems of time and cost overruns faced by all of them. The only difference was the quantum of these overruns. It can be known and controllable. Because of the following reasons still they are facing these overrun problems: 1. Poor project appraisal and formulation 2. Improper implementation of plans 3. No advanced action taken by any of the parties involved 4. No advance clearances from the local authorities and other agencies 5. No adequate measures were taken for the availability and proper flow of funds 6. Delays in decision making 7. Loosely framed contracts 8. Poor monitoring and control of activities 9. Insufficient use of modern technologies available."

References

[1] Poonam Raykar and Ghadge A.N., "Analyzing the Critical Factors Influencing the Time Overrun and Cost Overrun in Construction Project", International Journal of Engineering Research, Volume 5, Issue 1, 21-25.
[2]
[3] T.Subramani, P S Sruthi and M.Kavitha, "Causes of Cost Overrun in Construction", IOSR Journal of Engineering, Vol. 04, Issue 06, 1-7.
[4] Ram Singh, "Delays and Cost Overruns in Infrastructure Projects: Extent, Causes and Remedies", Economic & Political Weekly, May 22, 2010, Volume 14, 43-54
[5] Mr. Salim S. Mulla and Prof. Ashish P. Waghmare, "A Study of Factors Caused for Time & Cost Overruns in Construction Project & their

Remedial Measures", Mr. Salim S. Mulla Int. Journal of Engineering Research and Applications, Vol. 5, Issue 1, 48-53

[6] Shreyash Raut, S S Pimplikar and Karan Sawant, "Effect of project cost and time monitoring on progress of construction project", International Journal of Research in Engineering and Technology, eISSN: 2319-1163, 796-800.

[7] Guruprasad Chavan, Amit Sharma and Ajay Kumar Nirala, "Questionnaire Survey: For Identifying Most Cost Influencing Parameter In Case Of Road Projects", International Journal of Scientific and Research Publications, Volume 5, Issue 5, 1-9.

[8] Dhanashree S Tejale, Dr. S D Khandekar and Dr. J R Patil, "Analysis of Construction Project Cost Overrun by Statistical Method", International Journal of Advance Research in Computer Science and Management Studies, Volume 3, Issue 5, 349-355.