

Case Study on “Budget and Schedule Overrun during the Construction phase of Project”

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Abstract - Delay and budget overrun are inherent part of most projects despite the much acquired knowledge in project management. It is important to note that physical and economic scale of projects today is such that it is driven under the platform of profit to the parent organization, and of national interest (for government projects) by the degree of success defined within the Iron triangle of cost, time, and scope. It is therefore much appreciated to look at some reasons of delays and cost overrun in project and their mitigation process, so as to increase the perception of project success. In this industry it is well known that most construction projects are exposed to time and cost overrun. Literatures of previous studies were classified into two main parts which are factors effecting: (1) Schedule overruns of project; (2) Budget overrun. Most studies like these were revised which also included the study of the factors mentioned above in many countries. The aim of this study is to evaluate factors consequence time and cost overruns on construction projects in India. The objectives of the study were concluded through valid applications. The study clarified that “Lack of maintenance of the equipment” “Poor procurement programming of materials, Strikes, riots and other external factors was the most critical factor that influence project delay. The study illustrated that “delay in preliminary handing over the site” “Low productivity of labour” was one of the most important factors that may lead to Budget overrun. Also it clarified that contractor's delay of material delivery and equipment has led to cost overrun. The study also clarified that prices inflation highly contributes to cost overrun.

Key Words: Budget Overrun, Schedule Overrun, Construction Projects.

1. INTRODUCTION

In this construction industry, physical development can be achieved, and that is truly the wheel of the national economy. The increasing complexity of infrastructure projects and the environment within which they are constructed place greater and higher demands on construction managers to deliver projects on time, within the planned budget and with high quality. Infrastructure plays an important role in the economic growth of our country. Today, India is one of the leading outsourcing centre in the world. Besides this, due to various issues, larger number of infrastructure projects in India are being delayed.

Delay and budget overrun are inherent part of most projects despite the much acquired knowledge in project management. It is important to note that physical and economic scale of projects today is such that it is driven under the platform of profit to the parent organization, and of national interest (for government projects) by the degree of success defined within the Iron triangle of cost, time, and scope. It is therefore much appreciated to look at some reasons of delays and cost overrun in project and their mitigation process, so as to increase the perception of project success.

Here we took the several projects as a case study over which we can show how the budget and schedule overrun during its construction phase of project and give remedies to the same. The name of the project or place was kept confidential as the company polices.

1.1 Indian Construction Sector

The successful execution of construction projects and keeping them within estimated cost and prescribed schedules depends upon methods that require sound engineering judgment. But, because of the disapproval of owners, contractors and consultants, however, many projects struggle huge delays and thereby exceed initial time and cost estimates. This problem is more obvious in the traditional contracts in which the contract is awarded to the lowest bidding contractor. Although the construction industry in our country has been suffered ever since last decade, recent activities in the region with the restructuring of economies and attracting foreign investment are expected to yield a miraculous growth in the construction industry. Therefore, cost-effectiveness and timeliness could improve construction efficiency that would certainly contribute to cost savings for the country. Effectiveness of cost and time were linked with managing cost and time, which in this study were approached via investigating time and cost overruns of construction projects in India. In the construction industry, physical development can be achieved which is the wheel of the national economy. The more materials, engineering labour, resources, equipment, and capital market exchange are provided within the national economy, the higher is the effect of the extent of self-confidence. The increasing complexity of infrastructure projects and the surrounding within which they are to be constructed place higher

demands on construction manager to deliver projects on time in the planned budget and with high quality.

1.2 Schedule Overrun

Schedule Overrun occurs when a project's time restriction is violated. In other words project doesn't meet its expected deadline as some of tasks from its Critical Path have been delayed by the project team. Schedule Overrun makes the Project Client not satisfied by performance of the team, as the project has run out of its predefined timeframes, but the desired project haven't been handing over to the Client yet. Schedule overrun may mean not only non-meeting of the final due date of a project, but also missing to match predefined project milestones while this project is still in process, which may underlie further delay if not rectified as appropriate.

1.3 Budget Overrun

A Budget overrun, also known as a cost increase, underrated or cost overrun, involves unexpected costs incurred in excess of budgeted amounts due to an underestimation of the actual cost during budgeting. Budget overrun should be distinguished from cost escalation, which is an anticipated growth in a budgeted cost due to factors such as inflation.

$$\text{Cost Overrun} = \frac{\text{Final Contract Amount} - \text{Original Contract Amount}}{\text{Original Contract Amount}}$$

2. LITERATURE REVIEW

Vaibhav Y. Katre, Dr. D.M. Ghaitidak (2016), "Elements of Cost and Schedule Overrun in Construction Projects"

They Studied the existing projects where the cost and time overrun affects the project and make bad impact in market by interviewing the project manager and related personal. They analyze the fact and give suggestion to the project related companies to improve managerial skills by conducting training program and workshops and also improve communication between project participants in project phase.

T. Subramani, et al (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.

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.

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, analyze 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.

Ramanathan Chidambaram and Narayanan Sambu Potty (2014), "Qualitative analysis of Time delay and Cost overrun in Multiple Design and Build Projects"

Projects are more complicated involving huge contract values, participants from multi-discipline, more specialized works, tighter schedule, stringent quality standards, etc. Ultimately, cost and time are the two key parameters that plays significant role in a project success. The study focuses on multiple Design and Build project which has complicated risk and is governed by fixed contract sum (Lump sum). As such, there is no such specific study to address this problem

faced in Malaysia construction industry. Qualitative research was applied at three stages of projects for time delay and two aspects for cost overrun. This paper presents one aspect each for time delay and cost overrun.

3. Problem Statement and Objective

A. Problem Statement

1. Material Unavailability.
2. Design Errors
3. Scope Changes
4. Inappropriate and inadequate procurement
5. Lack of project leadership skills.
6. Communication problem between project participants

B. Objective

1. Analyses for rectifying the factors that significantly affect budget overruns and schedule overrun.
2. To find out the impact of over-runs on the stakeholders.
3. To analyze how frequent of these causes occur.
4. To study how the factors of different types help in increase budget overrun and schedule overrun in the construction industry and make a mitigation plan for it.
5. Investigation of the reasons and the responsibilities for cost overruns and schedule delays by collecting, reviewing, processing and analyzing change order and contract information data.

4. Methodology

1. Identifying the project which currently under Budget overrun and schedule overrun, Data collection of current ongoing projects by interviewing the project authorities and contractors to find out the problem.
2. Find out the factor which influence the schedule and Budget overrun
3. Study of all the documents which are related to the projects like drawings, BOQ's, Work orders, Budget sheet, etc.
3. Suggest the remedies to the problem.

5. Case Study/Data Collection

Two Residential projects was selected for case study but the Name of project and Company are kept confidential as per the company polices. So both the projects are under construction phase in which one is the Premium Class project and other is Economic Class Project. Both Projects have different Cash flows and Different Specifications. These Case Study analyses the main reason for Schedule overrun and its direct impact on the Budget of the project. There are many risk factors involves in construction phase of project. With the help of Project In-charge of both projects we came to know about the actual causes of schedule and budget overrun.

Premium class project are having 1st quality high cost related materials where Economy class projects having

middle class of material like in Flooring Premium class project having Italian marble and in Economy class project having Vitrified tiles. Such kind of specification makes procurement more complex during construction phase. The main reason for Schedule overrun and budget overrun was explained by the in-charge such as procurement plans, scope finalization period, customer changes, Raw material Non - availability, Drawing finalization, Technical clearance, Co-ordination with Contractors and stack holder of the projects or supporting team, etc.

Sr. No	Name	Details
1	Project Type	Premium Class
2	Project Start Date	20 March 2017
3	Project Finish Date	20 April 2020
4	Actual Start Date	20 March 2017
5	Actual Finish Date as per current Tracking Status	16 Sep 2020
6	Delay in Days	149 Days
7	Planned Cost at 100% Project Completion(Approx.)	228 Cr.
8	Actual Cost at 30% Project Completion (Approx.)	69.5 Cr.
9	Expected Cost to be spend (Approx.)	68 Cr
10	Increased Cost	1.5 Cr.

Table 5.1- Details of Project 1

Sr. No	Name	Details
1	Project Type	Economic Class
2	Project Start Date	1 June 2017
3	Project Finish Date	31 Dec 2019
4	Actual Start Date	1 June 2017
5	Actual Finish Date as per current Tracking Status	25 March 2020
6	Delay in Days	85 Days
7	Planned Cost at 100% Project Completion(Approx.)	200 Cr.
8	Actual Cost at 60% Project Completion (Approx.)	122 Cr.
9	Expected Cost to be spend (Approx.)	120 Cr
10	Increased Cost	2 Cr.

Table 5.2- Details of Project 2

Comparison based on actual status of the project is given.

Both the project are having different site conditions, so it is also to be take into consideration while planning the project.

By Studying the BOQ's related to various Activities, it has been observed that BOQ which are made by the Estimation Department of the company are having approximate Quantities which are to be used for preparing the budget of the project but when it comes to actual measurement of the quantity to pass the Running account bills, It shows increased amount of calculated amount in BOQ's, So It basically increase the Cost of the project.

Schedule which are made at initial stage of the project are based on initial data but when it comes to actual tracking of the project it shows delay in the progress due to Predicted duration of the activity without referring methodology of that activities and manpower also.

6. Study analysis/ Suggestion Given-

- i. Make a Practical schedule considering Site Condition, Climate Conditions, Holidays, Labour Productivity and No. of contractors which are working for finishing activities.
- ii. Freeze the Scope of work
- iii. Budget shall be created by considering extra items which are involved later on stage of the project or kept extra contingency percentage.
- iv. Make Procurement Schedule at the initial sage of the project so that it would meet the requirement of project as per schedule and also keep the current progress update of site.
- v. Drawing Tracking schedule also need to maintain for early delivery of "Good for construction" Drawings on Site.
- vi. 4 Month Rolling Plan shall be prepared and Track on Monthly basis.
- vii. Tender schedule shall be prepared as per Micro Activity which are required to complete the project including its lead period.
- viii. Prepare the Cash flow report required for the next Four month of the project for effective tracking on Cash.
- ix. Weekly Tracking/ Monitoring of the activity required on site by planning team so that action to be taken on critical activities before it get delayed.

7. Conclusion

Time and cost overrun have been a major recurring problem in construction industry. Brief reasons for time overruns as reported by various project implementing agencies are delay in land acquisition, delay in equipment erection, inadequate mobilization by the contractor, delay in forest clearance, fund constraints, change in scope of work, cancellation of tender, law & order problem, delay in supply of equipment, slow progress of civil work, escalation in cost

Realizing the importance of subject, construction delay not only results in time overrun but also in cost overrun. There are various causes due to which project suffers from these delays. As the project is running on many

number of factors & participant, these all are having individual causes. But the important participants like owner, contractor, and consultant have more influence on project performance. Hence the causes of these participants are discussed which will helpful to improve the project delivery in terms of time as well as cost efficient.

Study analysis or Suggestion which are given is useful to reduce the Budget and schedule overrun during construction phase of project.

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