

# Elements of Cost Overruns, Delays and Risk Involved in Construction Management



## Engineering

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### ABSTRACT

*Now a days 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 Indian construction industry. Qualitative research was applied at three stages of projects for time delay and two aspects for cost overrun. One aspect each for time delay and cost overrun. This benefits the industry in managing projects proactively with appropriate risk response plan to the respective region. Projects delay and cost overrun have become general facts in the construction industry. Project cost risk analysis considers the different costs associated with a project and focuses on the uncertainties and risks that may affect these costs. An implementation of project risk management (PRM) process on regional construction project has been carried out to maximize the likelihood of project meeting its objectives within its constraints. Qualitative and quantitative risk analyses have been carried out.*

### INTRODUCTION

The construction industry plays an important role in achieving fully developed nation status. Completing projects on time are an indicator of efficient construction industry. In fact, a project is considered 'successful' if it is completed on time, within budget and to the specified quality. Normally, when the projects are delayed, they are either extended or accelerated and therefore, incur additional cost. To the dislike of owners, contractors and consultants many projects experience extensive delays and thereby exceed initial time and cost estimates. The construction process is subject to many variables and unpredictable factors. Delivering a project on time does not occur by hoping that the required completion date will be met. To plan and manage a successful project, the three parameters of time, cost and quality should be considered. The clients in the construction industry are primarily concerned with quality, time and cost. But majority of construction projects are procured on the basis of the constraints time and cost. Cost escalation and time overruns are typically associated with poor management practices.

#### Causes of Cost Overrun

Many causes of cost overrun have been listed from the literature review. But the causes of cost overrun in those previous studies were from the view of a particular stakeholder or focusing on a particular area or country. This makes it necessary to know the view of construction stakeholders in our region, in India. Knowing the causes allows us to prioritize action to mitigate cost overrun. The basis of results in this thesis is the questionnaire survey conducted among the stakeholders in construction industry. The causes of cost overrun were first examined on the basis of responses from clients, consultants and contractors separately. The causes were ranked on the basis of occurrence, impact and importance as responded by the different stakeholders the rankings by each category of stakeholders will be correlated using spearman's rank correlation to see if the responses can be taken as a whole to determine importance.

"Slow decision making" was ranked as the cause with the highest probability of occurring and having the highest impact, and making it the most important cause of cost overrun according to clients. Many of the clients who responded were part of government authorities and they worked with government infrastructure projects.

"Poor design/delay in providing design" was ranked first in importance by consultants. It was also first in terms of impact on cost. Since the responsibility of providing the design lies with the consultants themselves, the high ranking suggests consultants acknowledge a critical area of project management. "Poor schedule management" was ranked 2nd in terms of importance and was 1st along with increase in material/machine prices in occurrence. "Poor schedule management" was ranked similarly high with similar importance by clients also, Keeping up with the schedule is a responsibility of contractors.

#### Delay Factors

Causes of delay in the construction industry lead to many negative effects such as loss of productivity and revenue, lawsuits between owners and contractors, and contract termination.

For construction projects cost and time overrun is one of the biggest problems that construction firms face in country. This is because most companies in india don't have any risk analysis and management plans. Some of the problems that face the construction projects in india are in common with other problems that face the construction industry all over the world which will lead to the cost and time overrun.

#### Project Cost Risk

Cost risk assessment is an essential part of project risk analysis. Cost risk analysis considers the different costs associated with a project (labor, materials, equipment, administration, etc.) and focuses on the uncertainties and risks that may affect these costs. A project simulation uses a model that translates the uncertainties into their potential impact on project objectives. Uncertain activities with cost impact not always arise, but we need to know how to handle them when they arise. To assess the uncertainty in a project's cost it will need to breakdown the total cost into parts, describe the uncertainty in each part and then put the parts back together to give a picture of the whole project cost. This is usually established from a Work Breakdown Structure (WBS) which is a document that details, from the top down, the different work packages (WPs) of which the project consists, see Figure . Each WP may then be subdivided into an invoice of quantities and estimates of the labor required to complete them as illustrated in Fig-

ure. Uncertainties usually exist in a number of cost items in each Work Packages.

## LITERATURE REVIEW

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.

Ramanathan Chidambaram, and Narayanan Sambu Poty(2014), "Qualitative analysis of Time delay and Cost overrun in Multiple Design and Build Projects" Projects are more complicated involving huge contract values, 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.

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.

## PROBLEM STATEMENT AND OBJECTIVE

### A. Problem Statement

- Unavailability of materials.
- Excessive amendments of design and drawings
- Poor coordination among participants
- Ineffective monitoring and feedback
- Lack of project leadership skills.

### B. Objective

The main objectives of this study are as follows:

- Study of problem of cost overrun in construction projects
- To find out the important factors responsible for cost overrun
- Identifying delay risks for construction projects from the view point of owner, contractor and consultant.
- Evaluating delay risks for construction projects for prioritization.
- Classifying risks as strategic, systematic and managerial to identify responsive parts.

## DATA COLLECTION & ANALYSIS

Based on the all the projects, this section analyses the main reasons for cost overruns and delays and they have many risk factor. This section is based on the results of all the projects. The interviewees were asked about the main reasons for cost overruns in the poor cost performance projects and the factors which avoided it in good performance projects. The interviewees were explained with the definition of cost overrun, according to this research so as to prevent their own perception from clouding the responses. The data about each case were mainly collected from the interviewees, so it is important to make sure that they knew the definitions of the research. Some information was also collected from Internet.

In this research, two renowned Indian construction companies with similar characteristics were chosen. Four different projects were selected from these companies, two with good cost performance and two with poor cost performance as shown in Table. Due to confidentiality issues, the name of the companies will not be revealed.

The answers given by the project managers, contractors, consultants, construction managers, and representatives of clients from the survey are analyzed. Some information about the company has been given from the interviewees and the information given has been verified with Internet research. Four case studies were used in the research from the reputed contracting company in India. The interview protocols were sent to various people by the researcher. Four interviewees have acknowledged to have a one-hour semi-organised meeting. Along these lines, the whole research configuration of this thesis was focused around the four meetings which were conveyed by the two task administrators of an organisation and the review aftereffects of members. Each of the undertaking administrators was talked with around two separate activities unified with great execution and an alternate with poor execution. According to the necessities of the exploration, the interviewees must be either senior venture pioneers or at the base ought to be working at a managerial level. To guarantee that the interviewees met the necessities, a portion of the inquiries were about the points of interest of interviewees.

## CONCLUSION

This study is conducted to investigate the cost overrun in Palestinian building construction projects from consultants' perspective through a questionnaire survey. The analysis of the participants' responses reveals that the cost overrun in building construction projects is a severe problem. 100% of the respondents indicated that the average cost overrun that they have experienced is between 10% and 30% of the project's estimated cost Inputs of the consultants underline that the top five factors affecting cost overrun in building construction projects are: political situation, fluctuation of prices of materials, level of competitors, currency exchange, and economic instability. There is a good data consistency and agreement between consultants on the severity and frequency of the identified cost overrun factors. It also shows

that the participants are highly agreed on the impact and frequency of the top affecting factors. Based on the study findings, the following points are suggested in order to minimize and control cost overrun in building construction projects.

- Training courses and workshops should be conducted to improve managerial skills of project participants.
- Material prices and labor rates should be updated continuously.
- Sufficient time should be given for preparing feasibility studies, planning, design, information documentation and tender submission. This helps avoiding or minimizing late changes.
- Progress payment should be paid on time.
- 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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