

# **A STUDY ON COST AND TIME OVERRUN AND ITS PREVENTIVE MEASURES IN BUILDING CONSTRUCTION PROJECTS**

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**ABSTRACT—** India is the tenth largest country in the World and yet her record of implementing major projects has been far from satisfactory. It has been observed very frequently that most of the projects in India ended with extra involvement of time, money and resources. The successful completion of construction projects within the specified time has become the most valuable and challenging task for the Managers, Architects, Engineers and Contractors. How to achieve this task is a problem, which should be solved. The overall objective of this study is to identify the factors responsible for overruns in time and cost of the construction project and suggest the suitable remedial solutions. Poor planning, implementation and management are the main reasons for time and cost overruns in construction projects in India. Since most of the reasons are well known and can be controlled if a proper arrangement is made.

**KEYWORDS—** Cost overrun, Time overrun, Key factors identification, Construction projects, Cost and time management

## I. INTRODUCTION

Any construction projects involve various factors which have various impacts on projects right from the start of the project till its completion. Construction Industry in India is one of the most important sector involving with various stages involved right from the starting phase till the completion phase and even after successful completion of the project Cost and time management is an integral part of the various process and stages for identifying the different factors associated with a project. In its broader manner it can be said to look for more positive events in the project thus by reducing or minimizing the impact of negative or unwanted events so as to reduce the probable overrun factors. No project or industry is free from all of them bears risk at various stages at different amount and varies from one activity to

other. Objective of cost and time management is to reduce different factors affecting the project at the different stages so as to minimize loss. The main Objectives of cost and time overrun are:

- ✓ To identify the time and cost overrun factors in different types of building construction projects.
- ✓ To prepare the questionnaires for critical factors.
- ✓ To identify the key factors based on the data of questionnaire survey.
- ✓ To evaluate critical factor by analyzing and finding the possible measures to the building construction in order to avoid the identified factors in the future projects.

## II.LITERATURE REVIEW

**A Study of Factors Caused for Time & Cost Overruns in Construction Projects & their Remedial Measures Mr.Salim , S.Mulla ( Vol 5 & issue 1,2015 ).** The Construction industry is one of the key economic industry in India and is the main motivating force in Indian national economy. But, it suffers from a number of problems that affect time, cost and quality performances. Successful management of construction projects is based on three major factors i.e. time, cost and quality. The successful completion of construction projects within the specified time has become the most valuable and challenging task for the Managers, Architects, Engineers and Contractors.

**Cost Overrun in Construction Projects in Saudi Arabia: Contractors Prospective M.Abdulaziz Alghonamy (Vol.15 ,Jan 2015).** Cost performance of a project is usually a particularly

important consideration for the construction parties. Often, Cost overrun is one of the most recurring problems in the construction industry and it has an adverse impact on project success in terms of time, cost, quality and safety. This study is conducted to investigate the cost overrun in construction projects in Saudi Arabia in order to identify the causes of cost overrun and their importance according to contractors through a questionnaire survey.

**Factors Affecting Time Overruns in Public Construction Projects:The case of Jordan, Ghalab J.Swesia ( Vol. 8 Issue 3, June 2013).**

Most construction projects in developing countries are characterized by overruns in time. This research was conducted in an attempt to identify major factors for such overruns in the typical developing environment of Jordan. A descriptive study was carried out and two types of data were collected. The overrun variables were extracted from the literature and from a thorough examination of the perception of 30 engineers, and then ranked according to their Severity Index (the product of Importance Index and Frequency Index). The top ten factors causing time overruns in construction projects were identified and treated using Principal Component and Factor Analysis (PCFA).

**Study of relationship between time and cost overrun and productivity on constructions Dr.Oko John Ameh (Vol-1, Issue 7, July 2011).**

In most construction sites, best possible performance are unachievable with poor productivity resulting in time overrun and consequently cost escalation of the projects. According to Eldin and Egger (1990), construction productivity has been on a steady decline. The problem of low productivity is not limited to Nigeria. Proverbs et al. (1999) observed that construction productivity in the United Kingdom was lower than in many other European countries despite the encouraging signs observed in the 1980s boom. There is nothing as dangerous to an economy as a decrease in productivities because it creates inflationary pressure, social conflict and mutual suspicion (Drucker, 1980).

**Time overrun and cost effectiveness in the construction area, T.Subramani ,P.T.Lishitha (Volume 4, Issue 6).** Project management is the art of directing and coordinating human and material resources throughout the life of a project by using modern management techniques to achieve predetermined objectives of scope, cost, time and quality and participants satisfaction. The construction industry is usually very large, complex and different from other industries. The industry needs much investment and involves various types of participants One of the most common activities in the management is planning. Creating the project plan is the first thing you should do when undertaking any kind of project. However, many people fail to realize the value of a plan in saving time, money, and many problems.

### **III. COST AND TIME MANAGEMENT**

The scope of any project is very large: which carries with it important economic, political and social consequences. Throughout the world, the construction industry has changed rapidly over the past decade; companies are now faced with more risk and uncertainty than before. As the project starts taking up speed and progresses further many points, misunderstanding, conflicts starts to rise up which leads to probable time and cost overrun in the projects

#### **A. IMPORTANCE OF COST AND TIME MANAGEMENT**

Any Construction project related time and cost management delivers the following importance:

- Helps and Contributes to project success
- Recognizes uncertainty in the project stages and provides forecasts of possible outcomes
- To safeguard resources from surprising losses
- To be prepared to seize surprising opportunities
- To limit uncertainty, both in their minds and in the world

#### **B. ADVANTAGES OF COST AND TIME MANAGEMENT**

Following are advantages of risk management:

- To achieve the desired objectives
- Reduction of capital cost of the project by minimizing risk in time
- Less uncertainty
- Creation of value

#### **C. COST AND TIME OVERRUN**

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

Time overrun can be defined as late completion of works as compared to the planned schedule or contract schedule. It occurs when the progress of a contract falls behind its scheduled program. It may be caused by any party to the contract and may be a direct result of one or more circumstances. A contract delay has adverse effects on both the owner and contractor.

#### **IV. METHODOLOGY**

The methodology for the present project is to develop questionnaires considering all the attributes related to cost and time overrun factors of the building construction projects, to conduct the survey among all the stakeholders of different projects. This methodology brings in identifying the severe factors affecting building construction projects. To identify the cost and time overrun factors, literature reviews, books, conference and discussion with practitioners involved in construction industry (Site Engineers ,Contractors ,Owners, Labours) were carried out in both high budget and low budget project.

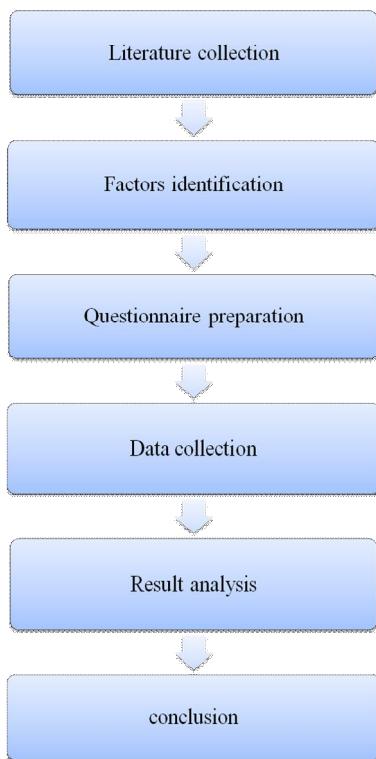


Fig 1. Methodology Flow Chart

#### **V. RESULT ANALYSIS**

The objective of conducting the analysis for this section is to establish the factors under the groups of causes identified from the literature review and the ranking according to their significant influence towards construction equipment management. This analysis is used for identifying the major factors that affect the construction equipment and improved efficiency of construction project.

##### **A. QUESTIONNAIRE SURVEY**

The purpose of this questionnaire is to analyse the time and cost factors and to identify the key factor which affect the building construction projects. It was mainly focused on related specializations to share their experiences and more. Hence we need your participation to share your opinions.

Number of questionnaire distributed	-70
Number of response received	-55
Response rate	-78.57%

##### **A. COST OVERRUN ANALYSIS**

S. No	Parameters	Mean
1	Inaccurate Estimation	3.273
2	High Transportation cost	3.873
3	Poor Contract Management	3.382
4	Rework Due to Defect	3.636
5	Escalation of Material prices	3.582
6	Labour Cost Increase And Higher Fabrication Cost	3.218
7	Cash flow of Project	3.109
8	Higher Cost Due to Longer Working Time	3.127
9	Unbilled Settlements	2.636
10	Lack of Proper Coordination	2.800
11	Adverse Effect of Weather	1.932
12	Inappropriate Government Policies	2.309
13	Fluctuation of Currency / Exchange in Rate	2.527
14	Inadequate Monitoring And Control	2.836
15	Increase in Cost of Skilled Labour	3.400
16	Complexity of Project	3.436
17	Mistakes During Construction	3.891
18	Change in Technology	2.891
19	Insurance Cost	2.527
20	Involvement of Too Many Parties	3.218

##### **B. TIME OVERRUN ANALYSIS**

S. No	Parameters	Mean
1	Difficulty to Get Permit	4.382
2	Material Shortage	3.855
3	Inadequate Planning of Project Before Commencement	3.345
4	Poor Site Management	2.836
5	Delay in Payment by Owner	3.545
6	Lack Of Team Work	3.145
7	Slow Decision Making	2.909
8	Accidents During Construction	2.236
9	Delay in Inspection And Testing of Completed Work	3.709
10	Adverse Weather Conditions	1.691
11	Political Instability And Change in Government Policies	1.691
12	Labour Absentees	2.836
13	Community Issues	2.236
14	Insufficient Data Collection	3.218
15	Delay in Site Mobilisation	3.091
16	Ineffective Planning & Scheduling	3.673
17	Slow Site Clearance	3.509
18	Labour Strike	2.564
19	Inadequate Client Finance	3.873
20	Suspension of Work by Owner	3.545

### C. RELATIVE IMPORTANT INDEX (RII)

The questionnaires are collected and analysed using statistical software package SPSS v 21. The ranking of factors was calculated based on Relative Importance Index:

$$RII(\%) = \sum a * \frac{n}{N} * \frac{100}{5}$$

Where:

RII = Relative Important Index  
 a = constant expression weight  
 n = frequency of response  
 N = total number of response

S No	Cost overrun factors	Rank
1.	Mistakes during construction	1
2.	High transportation cost	2
3.	Rework due to defect	3
4.	Escalation of material price	4
5.	Complexity of project	5

Table 3. Rank of cost overrun factors

S No	Time overrun factors	Rank
1.	Difficulty to get permit	1
2.	Inadequate client finance	2
3.	Material shortage	3
4.	Delay in inspection and testing of completed work	4
5.	Ineffective planning & scheduling	5

Table 4. Rank of cost overrun factors

### VI. CONCLUSION

Time and cost overruns is a severe problems faced by large construction industries in India. It is resulted from various factors which had been identified in this study. A total of 70 samples were found as valid and analysed statically using relative importance index method on 40 factors on time and cost factors.

In our study we found that five most significant factors causing time and cost overruns in building constructions. The five major cost overrun factors are mistakes during constructions, High transportation cost, Rework due to defect, Escalation of material price, Complexity of project. The five major time overrun factors are Difficulty to get permit, inadequate client finance, Material shortage, Delay in inspection and testing of completed work, Ineffective planning & scheduling.

### VII. RECOMMENDATIONS

When the time and cost overrun factors are identified, the possibilities of overrun factors

affecting the building construction will be minimized and neglected. This will happen only bellowed ways

#### A. BY CONTRACTORS:

Contractors are recommended to be attentive about construction materials and prices, so they are advised to purchase the construction materials at the commencement of work. The quality of activities should be monitored continuously. Also it is advised to monitor financial spending of the project and payments because any problem in financial aspect will lead to time and cost overruns.

#### B. BY OWNERS:

Owners are recommended to revise the bid documents such as specifications, quantity take off, drawings and the design of project in organised way. Owners are advised to directly involve in case of any disputes between contractor and consultant to prevent the effects of such problems on the project accomplishment and quality used in project. Owners should minimize change orders as possible as in order to avoid any time and cost overruns.

#### C. CONSULTANTS:

Consultants payments of contractor to avoid any delay or cost overruns at the project. Consultants are advised to hire a qualified and sound technical staff to manage the project, so he would be able to overcome any technical or management problems that happen. It is also advised for consultant to have high qualification and knowledge to give a suitable instruction in a suitable time and to be able to answer any question stated by contractor to avoid time and cost overruns. are recommended to review and approve design documents, shop drawings and other issues.

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