

Investigation Of Factor Influencing Cost And Time Overrun In Building Construction Projects

Sivasankar.S^[1]

Department of Civil Engineering
PSR Engineering College, Sivakasi.
Tamil Nadu, India

Vinothkumar.R^[1]

Department of Civil Engineering
PSR Engineering College, Sivakasi
Tamil Nadu, India

T.vairamuni^[2]

Assistant Professor
Department of Civil Engineering
PSR Engineering College, Sivakasi
Tamil Nadu, India

ABSTRACT— *Time overruns and Cost overruns has been a major issue in many Indian construction projects. The successful execution of construction projects and keeping them within prescribed schedule and cost is very important for effective time performance and cost performance. This research work is carried out on studying significant factors causing Time overruns and Cost overruns in Indian construction projects. A valid questionnaire for the survey was developed based on factors for time overruns and factors for cost overruns identified from literature review. These factors are grouped into 12 categories for time overruns and 8 categories for cost overruns and distributed to Contractors, Consultants, and Owners of Indian construction Industry. The data from the questionnaire was analyzed statistically. Relative important index method was used to found out the most significant factors affecting Time and Cost overruns. The result accomplished from the survey revealed that the major cause for time overruns are material market rate, contract modification, and high level of quality requirement and the major cause for cost overruns are high transportation cost, change in material specification, and escalation of materials price. The study findings highlight the significant factors and some recommendations are given to control time and cost overruns in Indian construction Industry.*

KEYWORDS— Construction Industry, Cost overruns, India, Relative Important Index, Time overruns.

I. INTRODUCTION

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.

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. also research and studies in this field in India are few compared to worthy expected results. The objectives of this research are:

- ✓ To identify the factors influencing time and cost overruns in construction projects and to evaluate their relative importance.
- ✓ To determine the owners, consultants and contractors perception towards the relative importance of key Time performance and Cost performance indicators in construction projects in order to evaluate their performance.
- ✓ To formulate recommendations for improving time and cost performance.

II. LITERATURE REVIEW

A Study of Factors Caused for Time & Cost Overruns in Construction Projects & their Remedial Measures (Al- Gahtani and Mohan 2007) (Vol 5 & issue 1,2015). Many factors related to time overruns vary along with types of project, location, size and scope of project. Time and cost increase is common phenomenon in projects worldwide. However, these are especially severe in developing countries.

Cost Overrun in Construction Projects in Saudi Arabia: Contractors Perspective 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.Swesis (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. Methodology

The research methodology for present study has adopted questionnaire survey to identify significant factors influencing time overruns and cost overruns in Indian construction projects. To identify time overruns and cost overruns factors, literature reviews, books, conference proceedings and discussion with practitioners of all parties involved in construction industry were carried out. Questionnaire for the survey was developed based on 76 factors of time overruns and 54 factors of cost overruns and grouped in to 12 and 8 major groups. For each factor the respondents were requested to rate using five point scale of 1 to 5 is adopted. It is categorized as follows 5=not sure; 4=not important at all; 3=sometimes important; 2=important; and 1=very important. Prior to formulating questionnaire, a field study was carried out

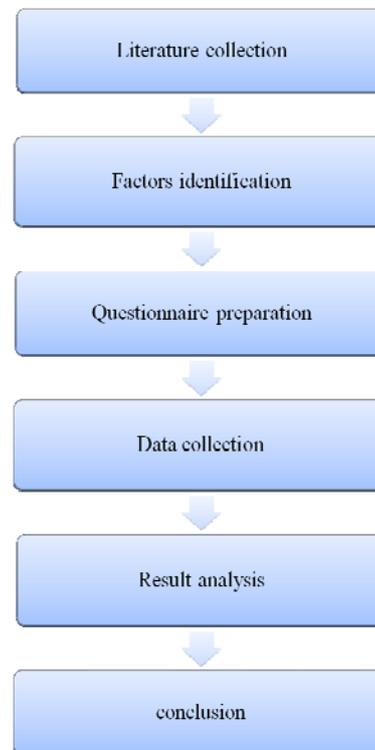


Fig 1. Methodology Flow Chart

IV. 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%

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

A. COST OVERRUN ANALYSIS

B. TIME OVERRUN ANALYSIS

S. No	Factors of time overruns	Mean	Rank
1	Material market rate	3.273	1
2	Contract modification	3.873	2
3	High level of quality requirement	3.382	3
4	Project location	3.636	3
5	Rework of bad quality performance	3.582	6
6	Often changing sub contractors company	3.218	7
7	Lack of technical skill	3.109	8
8	lack of experience in similar projects	3.127	9
9	Shortage of experienced staff and labour	2.636	10
10	Incomplete drawing	2.800	16

S. No	Factors of cost overruns	Mean	Rank
1	High transportation cost	4.382	1
2	Change in material specification	3.855	2
3	Escalation of material price	3.345	3
4	Lack of coordination	2.836	6
5	Additional work	3.545	9
6	Material fluctuation	3.145	8
7	Inaccurate design	2.909	14
8	Higher cost of machinery	2.236	18
9	Lack of financial management	3.709	14
10	Mistakes during construction	1.691	18

V. 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.

VI. 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 belloved 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.

REFERENCE

1. Factors Affecting Time Overruns in Public Construction Projects:the Case of Jordan.Ghaleb J.Sweis (Vol.8 No 23, 2013)
2. Cost Overrun In Construction Projects in Saudi Arabia:Contractors Perspective.abdulaiziz alghonamy (Vol.15 No 4)
3. Analysis Of Time And Cost Overrun To Key Success Of High Rise Commercial Building Project-A Case Study Prof.Pankaj P.Bhangale (Vol.7 Issue 4 , 2016)
4. Analysis Of Time And Cost Overruns In Educational Building Projects In Egypt Walid Kholif , Hossam Hosny And Abdelmonem Sanad (Vol-1, issue – 10 ,2013)
5. Cost Overruns And Failure In Construction Projects ,Anita Rauzana (Vol 18,issue-10 ,2016)
6. The Cause Factors Of Large Projects Cost Overrun:A Survey In The Southern Part Of Pennisular Malaysia ,Aftab Hameed Memom,Ismail Abdul Rahman (Vol-7 , 2012)
7. Identifying Factors Leading To Cost Overrun In Construction Projects In Jordan , Ghanim A.Bekr (Vol- 5 , Issue-3)
8. Causes Of Time Overrun in Building Projects In Nigeria:Contracting And Consulting Prespectives ,Dele Samuel Kadiri And Anthony Abiodun Shitu (Vol.3. No.4 ,2015)