

A Review on “Study & Analysis of Factors Affecting Time & Cost Overruns in Construction Projects & Their Remedies”

Mr. Omkar P. Shriramjwar¹ Prof. Pranav K. Lende²

¹P.G. Student ²Assistant Professor

^{1,2}Department of Civil Engineering

^{1,2}G. H. Raisoni University Amravati, Maharashtra, India

Abstract— Achievement of any construction venture depends on the timely completion of project within the specified budget. Method of execution, management of workers, equipment, scheduling and cost are some of the factors that affect the project management and these factors are the reason in for the cost and time overruns around the world. Every construction company is targeted to acquire money and profit at the end of each project. This is achieved by completing projects within the expected cost, time and quality targets. Cost overruns represent a constant source of concern for project developers and several researches have been developed in order to identify causes of these kinds of deviations worldwide. In this paper, a literature review was conducted in order to identify the most significant factors that leads to cost overruns in construction projects and the methods applied to identify them.

Keywords: Cost overrun, Time Delay, Construction Projects

I. INTRODUCTION

Construction industry around the world contributes to the socio-economic and infrastructures development growth of any region. In developing countries, vital indicator of the development is construction industries and its opportunities to grow faster. The construction industry is dynamic in nature due to the increasing of uncertainties in technology, budgets and development processes around the world. Time and cost overruns in construction industry or venture these days, become a serious issue around the world and in India during last few decades. Increasing need of infrastructure for the growing population around world, especially in developing countries, the project managers need to deliver assigned projects in time and within the estimated budget. A large number of construction projects in India have been delayed due to various reasons and issues, which has been studies by different researches, but these reasons in India varies from place to place, due to topography of the country.

Cost overrun is considered as one of the most important problems that affect construction projects progress, since it reduces the profit leading to enormous losses, and leaving the project in great troubles. Construction cost is one of the peak criteria of success of a project throughout its lifecycle and is of high concern to those who are involved in the construction industry. Cost overrun is common in infrastructure, building, and technology projects all over world. 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 overruns is defined as the extension of time beyond planned completion dates traceable to the contractors. Delays are incidents that impact a project's progress and postpone project activities, delay causing incidents may include weather delays, unavailability of

resources, design delays etc. In general, project delays occur as a result of project activities that have both external and internal causes and effect relationship. The actual date of completion is invariably different from the expected date. Delays are incidents that impact a project's progress and postpone project activities; delay causing incidents may include weather delays, unavailability of resources, design delays, etc. In general, project delays occur as a result of project activities that have both external and internal cause and effect relationship.

II. LITERATURE REVIEW

Surabattuni Murali et.al (2019): A Case Study Achievement of any construction venture depends on the timely completion of project within the specified budget. Method of execution, management of workers, equipment, scheduling and cost are some of the factors that affect the project management and these factors are the reason in for the cost and time overruns around the world. This study objective is to identify and prioritized the major causes of time and cost overrun in construction industry using a completed project. Data is collected from Shan-E-Awadh-ground anchoring project, Lucknow, the data is analyzed and compared with the estimated and actual budget schedules to understand the causes of cost and time overruns. [1]

Salim S. Mulla et.al (2015): The Construction industry is one of the key economic industries 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. [2]

Shabbab A Hammadi et.al (2016): The Construction Industry plays an important role in socio-economy development of any developing country. Construction time serves as a benchmark for assessing the performance of any project. Due to unexpected problems encountered during Conception, designing & construction phase often led to unwanted delay in project completion. A survey was conducted in Saudi Arabia to determine exact

factors responsible for project delay. This was achieved by carrying a critical analysis of the literature and carrying out a questionnaires survey among consultants, project managers and engineers involved in construction projects and collected their responses. [3]

Vaibhav Y. Katre et.al (2016): The aim of this study is to assess factors influencing time and cost overruns on construction projects in our country. The objectives of the study were achieved through valid questionnaire. The study clarified that Low productivity of labor, Delaying in Bill settlement, 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. [4]

T.Subramani et.al (2014): The Indian construction industry is an integral part of country's economy and its growth and a conduit for a substantial part of India's development investment. 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. [5]

Ammar Ali (2018): The construction industry is a vital element of the economy and has a significant effect on the efficiency and productivity of other industry sectors, risk Factors that leading to cost and time overrun in Mega Construction Projects in Malaysia. Cost, time, and quality are used to measure the accomplishing it within specified cost, time and quality. However, the construction industry is full of projects that are completed with significant time and cost overruns. According to Faridi et al. (2006) delays have an adverse impact on project success in terms of time, cost, quality and project performance and success. Generally, the success of a project is defined by safety. [6]

Abhimanyu S. Rathi et.al (2013): Study of Factors Influencing Cost Overruns. Cost overruns have become issues of serious concern in construction industry. These overruns have detrimental effect on the national economy. Cost overruns have many reasons/factors which are not taken into consideration at the time of planning resulting into delays and cost increases. In the present study, we have studied literature and identified those factors influencing cost overruns. The primary findings emanating from the study revealed that empirical studies have identified a number of important factors which cause projects cost overruns. [7]

Swapnil P. Wanjari et.al (2016): Delay and cost overrun are common phenomena in projects worldwide. However, these are especially severe in developing countries. In India as per MOSPI report, 235 projects out of 410 were severely affected cost overrun due to certain factors. A short questionnaire was conducted with 15 prominent factors responsible for cost overrun and forwarded to 190 constructional professionals across India. Total 85 responses were received and it was analyzed using various statistical tools such as analysis of variance (ANOVA) and factor analysis tool using SPSS. In this study, top three factors affecting cost overruns were identified such as price escalation of raw material, delay in

planned activity and lack of co-ordination between construction parties which could be significantly responsible for cost overrun of construction project in India. [8]

Santosh Kumar Prajapati et.al (2016): Many projects experience cost overrun and there for exceed initial contract amount. In Madhya Pradesh, the number of construction projects is increasing from time to time. However, it becomes difficult to complete projects in the allocated cost and time. Taking into account the scarce financial resources of the country, cost overrun is one of the major problems in Madhya Pradesh. Therefore, this research was carried out to dig-out information on the factors that cause cost overrun during construction and their effects on construction projects in Madhya Pradesh. Questionnaire survey together with desk study was used to collect data on cost overrun. A total of 27 questionnaires from clients, consultants and contractors were collected and a desk study of 34 completed public building construction projects in Madhya Pradesh were investigated and analyzed using both descriptive and inferential statistics [9]

Mohammed Abdul Moiz Hami et.al (2016): Unwanted delays in construction projects impose excessive costs and precipitate lengthy durations. The researcher focuses on the reasons for construction project delays and cost overruns. The researcher has conducted several interviews with contractors, consultants, owners, industry experts, and regulatory bodies to accurately specific delay factors. The result shows that many of the problems in the construction of projects are originated from poor resources management (human, technical and material).The overall results indicates that construction company directors felt that the cost and time should be prepared jointly by the contractor and consultant and be accepted as the baseline program and other causes are monthly payment difficulties from agencies, late material procurement, poor machine and technical performances, escalation in prices of material according to their degree of influence. Project managers feels that appropriate funding levels should always be determined at the planning stage of the project so that regular payment should be given to contractors for works done, while owners ranked poor contractor management as the most important factor. [10]

Prof. Yogini K. Patil et.al (2016): Cost overruns have been a major issue in many Indian construction projects especially in high- rise building projects. The successful execution of construction projects and keeping them within prescribed schedule and cost is very important for effective cost performance. The aim of the study is to investigate the factors influencing Cost overruns in Indian construction projects. A valid questionnaire for the survey was developed based on factors for cost overruns identified from literature review. These factors are grouped into 8 categories for cost overruns and distributed to Contractors, Consultants, and Owners of high-rise construction projects. [11]

Vemuru Tarakaram et.al : The population has been increases day by day, so in order to full fill their needs commercial complexes as increases malls are basically constructed to make people comfortable to buy all the goods and get entertained at the same place. That develop many reasons that are payable for this time and cost overruns. This

paper explain to define the prime causes of time and cost overrun factors in construction projects and forward further addressing these overruns. Construction projects are very important sector and plays a vital role in the growth of nation, later in republic of India construction engineering started a boom than its freedom. However construction industry in India facing chronic problems including poor performance of time and cost, over depend upon man power. These trails, is taken in to account as a vital issues. [12]

Abdussalam Shibani : The main aim of this paper is to identify the major reasons for cost overruns in construction projects in India as well as the critical success factors that are helping to avoid the cost overruns. For this, the existing literature is reviewed and critical success factors are identified. Based on them, survey questions and interview questions are prepared. The findings supported the proposed hypothesis, i.e., lack of certain critical success factors leads to cost overruns in construction projects in India. They also confirmed the proposed proactive and reactive strategies of some researchers. The effective critical success factors include appropriate planning in the initial stages, skills of contractors and architects, good relationship and regular coordination among client and contractor, and early contribution of contractor with the project. The ideal methods that help to reduce cost overruns include efficient planning, proper management of site and supervision of the project, suitable planning and arrangement of project, proper methods for construction, regular meetings on development of the project, and hiring proficient subcontractors and suppliers. [13]

Abdulelah Aljohani et.al (2017): Construction industries have a poor reputation in terms of finishing projects on budget. Nine out of ten projects normally experience cost overrun. Different causes for cost overrun have been identified. This paper critically reviews the literature concerning cost overrun in construction projects in different countries to identify the main potential causes. 173 causes of cost overrun have been found in seventeen contexts with the main potential causes being: frequent design change, contractors' financing, payment delay for completed work, and lack of contractor experience, poor cost estimation, poor tendering documentation, and poor material management. [14]

Swati S. Patil et.al (2014): Nowadays, the construction industry is becoming highly competitive which causes general contractors to bid with a very small margin of profit. At the same time, overhead costs are always increasing and never go down of its own, Overhead costs are extremely important in construction estimation. Neglecting overhead has forced some contractors out of business, because these costs constitute a significant portion of the total construction cost. Hence it is important to control overhead cost. Construction projects become complicated and fragmented so that many specialty contractors are involved. In such changed environments, a general contractor's overhead costs are increasing comparable to direct costs. In addition to an increase of volume, activities consisting of overhead costs play an important role in coordinating different participants who include different specialty contractors and client. The paper discusses the actual definition of overhead cost, contractor awareness

about overhead cost, percentage of OH costs, changes in overhead cost, causes of increased overhead cost in construction industry, contractors' perception about overhead cost, control of overhead cost. [15]

Abhishek Bhargava et.al (2010) described an empirical evidence that a simultaneous relationship exists between cost and time overruns from Indiana highway projects using three-stage least-squares technique. In this they identify a number of factors that significantly affect cost overrun and time overrun and they show how the effect of these variables vary by attributes such as project type and results of the bidding process. The models developed in this paper can help agencies enhance the estimation of the expected overruns of final cost and the delay in completion time for their planned projects. The impact of various explanatory factors on cost overrun and time delay was studied separately for bridge, maintenance, roadway reconstruction, pavement resurfacing, and traffic projects. This was done to show that the cost overrun or time delay for the different project types can generally differ due to the inherent construction practices and planning processes associated with each project type. The findings of this paper will assist highway agencies in significantly improving the process of construction cost and time forecasting during the planning phase, thereby making decisions that will yield benefits of reduced cost overruns and time delays, and ultimately result in enhanced highway project programming, reduced exposure to litigation, and enhanced public relations of the highway agency. [16]

Ghulam Abbas Niazi et al. (2015) identified the significant factors that lead to construction cost overruns in Afghanistan. The questionnaire was circulated to 75 construction practitioners, including clients, consultants and contractors. Causes are determined based on different categories such as contractor, client, labor, material and equipment's and external things .RII (Relative Importance Index) method was used for analysis. According to them Corruption was ranked as first major contributor of cost overrun with a RII value of 0.89. Corruption constitutes a serious threat to the Afghanistan Construction Industry being able to improve because it has a serious effect on construction cost growth. Delay in progress payment by the client, this factor was ranked the 2nd most significant contributor of cost overrun with a RII value of 0.82. [17]

III. METHODOLOGY

For carrying out the proposed work, following methodology will be adopted for data collecting and analysis.

1. Collection and study of literature pertaining to the dissertation work.
2. Analysis the collected data.
3. Surveys and interviews are conducted, in which a list of important factors causing delay in construction are identified.
4. In this study Relative Important index (RII) method used for ranking of causes of delay and cost overrun in the construction project.

IV. DATA ANALYSIS METHOD

Various methods are used for analyzing the factors as per the previous studies mentioned. The questionnaires were collected and analyzed using various methods to find the most significant factors influencing the cost overrun. Following are the various data analysis methods,

1. Frequency Index (FI)
2. Severity Index (SI)
3. Importance Index Method (IIM)
4. Relative Importance Index (RII)

In this work, the data analysis will be done by RII method.

1) Relative Importance Index Analysis

The procedure used in analyzing of data was aimed at establishing the relative importance of the various factors that contribute to causes of delays, effects of delays and methods of minimizing construction delays. There are three steps used in analyzing the data: calculating the relative importance index; ranking of each factors based on relative importance index, and to determine degree of correlation on ranking the factors among various groups. To determine the ranking of different factors from the viewpoint of contractors and consultants, the Relative Importance Index (RII) was computed using RII Equation:

$$RII = \Sigma W / AN$$

Where W = weighting given to each factor by the respondents and ranges from 1 to 4 where '1' is 'very little effect' and '4' is 'very high effect' ; N = total number of respondents; A= highest weight (i.e. 4 in this case)

V. EXPECTED CONCLUSION

There has been extensive research in many countries to explore the causes of cost & time delays in construction projects. The paper has brought out the salient findings of previous literature in both developing and developed countries and the gaps in previous research and the scope for future research. From the above review it is concluded that lot of research have been carried out on the Cost overrun & Time delay in construction projects. Cost overruns are one of the critical problems faced in the construction industry. A project may be considered to be a successful project only when it is completed within the budgeted cost. Based upon the various literatures reviews various factors causing cost overrun can be identified. And with the appropriate method of data analysis the most significant factors influencing the cost overruns can be analyzed. Based on the reviews it was identified that poor climatic conditions, improper planning and scheduling, fluctuations in the material rate, lack of proper site management, monitoring and controlling, improper management of resources in construction project and poor financial control in site can yield to cost overruns.

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