



RESEARCH ARTICLE

TO STUDY COST AND TIME OVERRUNS IN COMPLETION OF RESIDENTIAL PROJECT

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ABSTRACT

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 performances. The construction industry is dynamic in nature due to uncertainties in technology, budgets and development process. The Indian construction sector has been acted as an engine of growth for the Indian economy for over the past five-decades and becoming a basic input for the socio economic development of the country. Construction is the second largest economic activity after agriculture, and has contributed around six to nine percent of India's GDP over the past five years while registering eight to ten percent growth per annum. Projects are reportedly failing across all the key performance measures including cost, time and quality. Successful management of construction projects is based on three major factors i.e. time, cost and quality.

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INTRODUCTION

Construction industry is primarily concerned with time, cost & quality and yet the majority of construction projects are procured on the basis of only two of these parameters, namely time and cost. This is understandable since the majority of project management control which is defined as "the integration of all functions and processes within an organization in order to achieve continuous improvement of the quality of goods and services and the goal is customer satisfaction." systems highlight time and cost overlook the relative importance of quality. The major failings in traditional approaches to project delivery have been in extensive delays in the planned schedules, cost overruns, serious problems in quality, and an increase in the number of claims and litigation associated with construction projects. In order to plan and manage a successful project, the three parameters time, cost and quality should be considered because these factors are the three points of a triangle and neglecting one factor will have a corresponding detrimental effect upon the other two. The purpose of this paper is to explore how time, cost and quality management on building projects is perceived by those involved in project teams. Conclusions are drawn and

recommendations are made with respect to the perception of time, cost and quality management associated with building projects.

Objectives of the study

- To find out the relative importance index of the selected factors.
- To identify the factors responsible for overruns in time and cost of the construction project and suggest the suitable remedial solutions.
- Study the trend followed by organizations of good repute, by conducting surveys in the form of questionnaire.

Literature review

In 2006, Assaf and Al-Hejji evaluated 73 different causes of delay during the research work. They conducted survey of different types of construction projects in Saudi Arabia to identify the different causes of delay and their importance with the help of project parties involved in construction projects like owner, consultant and contractor. According to their research the most common cause of delay identified through all three parties was "change order" (Chan and Kumaraswamy, 1997). In 1997, Chan and Kumaraswamy evaluated five common factors of delays that affects during construction projects like

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unforeseen site condition, slow decision making, poor risk management and supervision, client-initiated variations and necessary variations of works (Alwi Sugiharto and Hampson Keith, 2003). In 2000, Al-momoni identified causes of delay in 130 public projects in Jordan. From the research the main causes of delays were design, user change, weather, site conditions, economic condition, late deliveries and increase in quality (Sadi A. Assaf and Sadiq Al-Hejji, 2006). In 2002, Aibinu and Jagboro did research on the effect of construction delays on project delivery in Nigerian construction industry. The six effects of delay identified like time over-run, cost over-run, dispute, arbitration, total abandonment and litigation (Aibinu *et al.*, 2002). In 2003, Sugiharto Alwi and Keith Hampson conducted survey to determine most important causes of delays within building projects in Indonesia. From literature they evaluated causes of delay related to people, professional management, design, documentation, material, execution and external causes of delay. With the help of questionnaires, survey was conducted between large contractors and small contractors on projects that had completed within the last five years. The interviewees included project manager, site managers, supervisor, foremen, labors. Data collected was analyzed using importance index and ranking was done by spearman's rank correl. In 2012, Doloi H did research to analyze factors affecting delays in Indian construction projects.

He selected set of 45 attributes. Their research first identified the key factors impacting delay in Indian construction industry and then established the relationship between the critical attributes for developing prediction models for assessing the impacts of these factors on delay. A questionnaire and personal interviews have formed the basis of their research. Factor analysis and regression modeling were used to examine the significance of the delay factors. From the factor analysis, most critical factors of construction delay were identified as lack of commitment followed by inefficient site management and poor site coordination ranked third.

RESEARCH METHODOLOGY

The research methodology is divided into two phases included a literature search and interviews. The first phase included review was conducted through various research paper, books, internet and international project management journals. Different sites (lohegaon, dhanori, alandi, dighi etc) were visited and questionnaire survey was used to elicit the attitude of owners, consultants, and contractors towards the factors affecting the performance of construction projects in the building projects in Indian construction industry. 50 sites were visited and questionnaire survey was conducted. The respondents were asked to indicate, based on their local experience the level of importance of each one of the identified factors of performance on a five-point Likert scale. The respondents were experienced construction project managers, site engineers/office engineers, and organizations managers (with average experience of 2 years in the construction industry). The performance factors were summarized and collected according to previous studies and others as recommended by local experts. The main factors considered in this paper are time, cost & quality and their sub factors.

Data analysis approach

The relative importance index method (RII) was used herein to determine owner's construction project managers, site engineers/office engineers, and organizations manager's perceptions of the relative importance of the identified performance factors. The RII was computed as

$$RII = \frac{\sum W}{AXN}$$

Where W is the weight given to each factor by the respondents and ranges from 1 to 5; A – the highest weight = 5; N – the total number of respondents.

RESULTS AND DISCUSSION

Table summarizes the computed RIIs and their ranks as perceived.

A. Cost Factors relative importance index and ranks

Table 1. RII and Rank for cost factors

Sr.No.	Cost factors	RRI	Rank
1	Waste rate of materials	0.568	9
2	Project labor cost	0.6	8
3	Project design cost	0.64	7
4	Cost of rework	0.648	6
5	Escalation of prices	0.656	5
6	Project budget update	0.668	4
7	Cost of variation orders	0.672	3
8	Profit rate of project	0.776	2
9	Materials & equipment cost	0.808	1

B. Time Factors relative importance index and ranks

Table 2. RII and Rank for time factors

Sr.No.	Time factors	RRI	Rank
1	Time needed to implement variation orders	0.78	7
2	Average delays in regular payment	0.736	6
3	Planned time for construction	0.712	5
4	Time needed to rectify defects	0.688	4
5	Average delay due to material shortage	0.676	3
6	Unavailability of resources	0.668	2
7	Site preparation time	0.78	1

Conclusion

The purpose of the research was to identify the causes of time and cost overruns by considering their sub factors and find out the relative importance index of time and cost sub factors respectively for assisting attempts to overcome shortcomings of TIME, COST and QUALITY management. The findings of this survey indicate that time and cost overruns can be minimized by following ways. Better Formulation and Appraisal of Projects, Assurance of Funds Resources, Better Contract Management, Penalties and Incentives, Monitoring, Advance government actions, Sound Implementation Planning. While the findings of the research do make us understand and realize on what factors due importance should be given to overcome the shortcomings of time and cost overruns. More

importantly, it points the way forward for further research into the 'human' aspect of how project teams can be more effectively managed in order to achieve client objectives, thereby providing a catalyst for change in practice for project completion within time and within budget.

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