

Analysis of Cost Overrun in Fast-Track Interior Fit-Out Projects

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Abstract - Cost overrun is leading factor which affects the construction activities and it is more common in Fast track projects, The impacts of cost overruns are very high in developing countries fast track activities are much affected by cost overrun due to various factors throughout the project cycle. The deviations between the actual cost incurred during construction phase and primarily cost is known as cost overrun and it is one of the most predominant factors affecting the successful completion of the overall project, factors which are mostly influencing the cost overrun in interior fit-outs of mass construction projects and rank the factors identifies based on their impact mostly affecting the construction activities finally giving recommendations to overcome the critical factors

Key Words: Cost overrun, Fast-track interior fit-outs, construction projects.

1. INTRODUCTION

Cost overrun in fast-track interior fit out projects in India is a critical issue that badly affects project delivery. This may lose the goal of building a larger number of fast track projects to reduce the concentration of the people, cost overruns generally result from different factors that occur at various phases of the project life cycle. These factors include Contractor's site management, Information and communication between parties, human resource, Design and documentation, Project management and contract administration, In this which are mostly influencing the cost overrun in interior fit-outs and rank the factors identifies based on their impact mostly affecting the construction activities finally giving recommendations to overcome the critical factors

2. OBJECTIVE

Main objectives of this study are:

1. To identify the various factors which are mostly influencing the fast track interior fit out projects.
2. To rank the factors based on their impacts and significance.
3. To find out various critical factors which are major reasons for the cost overruns.
4. To make recommendations to overcome or discard those critical factors in future fast-track interior fit out projects.

3. LITERATURE STUDY

A. A. ALHOMADI "The Predictability of Fast-Track Projects" in *Procedia Engineering* 14 (2011) 1966-19, A study conducted to analyze the causes of cost and schedule overruns in front-end loading delivery system of Alberta oil sands megaprojects, has highlighted that enabling a fast tracking strategy is one of the major strategies of cost overrun, and it causes about 40% to 50% of cost variance. - 72 [1].

Abhijeet Sudhakar Deshpande- "Best Practices for the Management of Design in Fast Track Industrial Projects" - (June 2009) In this case the design and construction phases have more than an eighty percent overlap, meaning that construction starts when the design is as little as ten percent complete. The procurement process begins concurrently with the design phase. [2].

Identification of Factor which Causes Cost Overrun and Delays in Infrastructure Projects" by Swapnil Naresh Bhardwaj- *International Journal of Engineering Technology, Management and Applied Sciences*. This paper analyzes delay causes in activities that were not completed as scheduled and describes the impacts of delay on critical and noncritical activities and analyses the scheduling failures. [3].

Cost overruns in Building Construction Projects"- A Case Study of a Government of Ghana Project in Accra by Kodwo Amoah-Abban Seth Allotey, Results from the study indicate that several factors contributed to the high cost overruns but salient among them was that, the total cost of additional works not initially included in the total estimate in the BOQ was high. An item of work whose initial cost was difficult to determine and as such was given provisional sums was later found to be exceptionally lower than the actual cost. The changes in the specifications and details of materials or components and the delayed payment of the contractor led to construction delays and increase in fluctuation costs [4].

4. METHODOLOGY

The following research steps to achieve the mentioned objectives.

1. Various factors responsible for cost overruns were collected from literature study and they were sorted in a desired group based on their category.
2. A questionnaire was prepared with 7 groups with 32 factors and a survey was conducted to gather the data

from selected respondents to find out critical factors causing cost overruns.

3. Each factor was given a scale of 0 to 3, so that person could easily express the asperity range or impact. i.e., 0 being the low and 3 being the high.

4. The scale for impactness is categorized into 4 types.

- a. 0 for No change in cost.
- b.1 for There will be a change in cost with permissible limit.
- c. 2 for It will make minor change in cost.
- d. 3 for It will make major change in cost.

5. Questionnaires were administered to a sample of 50 people selected from various contractors, subcontractors, site engineers and supervisors, of which 29 questionnaires were returned with completed responses.

6. Questionnaires were administered based on direct site analysis based on the site condition.

7. The scale value obtained for each factors were found out and ranked based on Relative Importance Index (RII) of the responses and site analysis results are computed for their impact and significance.

8. Findings of the study based on the statistical evaluation, are given.

9. Finally suggestions and recommendations are given to avoid the cost overruns in future fast- track interior fit out projects.

5. QUESTIONNAIRE SURVEY

The various factors of effects for cost overrun were collected from the literature study. Further, opinions were obtained from the various contractors, subcontractors, site engineers, supervisors, etc., were listed based on the division. Finally 7 groups with 29 factors were selected and considered for the questionnaire survey. The factors are listed below.

5.1 FACTORS OF COST OVERRUN

1. Contractor's site management related factors,

- a. Poor site management and supervision.
- b. Incompetent subcontractors.
- c. Schedule Delay.
- d. Inadequate planning and scheduling.
- e. Lack of experience.
- f. Inaccurate Time and Cost estimates.
- g. Mistakes during construction.
- h. Inadequate monitoring and control.

2. Design and documentation related factors,

- a. Frequent design changes
- b. Mistakes and Errors in design.
- c. Incomplete design at the time of tender.
- d. Delay in design and approval of design.

3. Financial management related factors,

- a. Cash flow and financial difficulties faced by contractors
- b. Poor financial control on site.
- c. Delay in progress payment by client.
- d. Financing and payment for completed works (Delays in payments).
- e. Contractual claims, such as, extension of time with cost claims

4. Information and communication related factors.

- a. Lack of coordination between parties.
- b. Slow information flow between parties.
- c. Lack of communication between parties.

5. Human resource (workforce) related factors.

- a. Labour productivity.
- b. Shortage of site workers.
- c. Shortage of technical personnel (skilled labour)
- d. High cost of labour.

6. Non-human resource related factors,

- a. Fluctuation of prices of materials.
- b. Shortages of materials
- c. Late delivery of materials and equipment.
- d. Equipment availability and failure.

7. Project management and contract administration related factors,

- a. Poor project management.
- b. Change in the scope of the project.
- c. Delays in decisions making.
- d. Inaccurate quantity take-off

5.2 DATA COLLECTED

Questionnaire survey:

No of questionnaire to respondents : 50

No of responses from the respondents : 29

Field analysis :

No of sites – (data collected) : 3

6. DATA ANALYSIS

6.1 Relative Importance Index Technique (RII)

Relative Importance Index or weight is a type of relative importance analyses. RII was used for the analysis because it best fits the purpose of this study. RII aids in finding the contribution a particular variable makes to the forecast of a criterion variable by itself and in combination with other forecaster variables.

In the calculation of the Relative Importance Index (RII), the formula below was used

$$RII = \sum W / (A*N)$$

where, *W*—weighting given to each statement by the respondents and ranges from 1 to 3; *A*—Higher response integer (5); and *N*—total number of respondents.

Table -1: RII –CALCULATED VALUE

Contractor's site management related factors	RII value	
	From respondents	Site investigation
1. Poor site management and supervision	2.497	1.11
2. Incompetent subcontractors	2.299	0.742
3. Schedule Delay	1.625	1.85
4. Inadequate planning and scheduling	2.695	1.11
5. Lack of experience	2.378	0.74
6. Inaccurate Time and Cost estimates	2.338	1.11
7. Mistakes during construction	2.259	1.85
8. Inadequate monitoring and control.	2.061	1.85
Design and documentation related factors	RII value	
	From respondents	Site investigation
		.

1. Frequent design changes	2.695	3.33
2. Mistakes and Errors in design	2.576	1.48
3. Incomplete design at the time of tender	2.418	1.11
4. Delay in design and approval of design.	1.704	2.22
Financial management related factors	RII value	
	From respondents	Site investigation
1. Cash flow and financial difficulties faced by contractors	1.863	0.37
2. Poor financial control on site	2.299	0.74
3. Delay in progress payment by client	2.14	1.11
4. Financing and payment for completed works (Delays in payments).	1.863	1.11
5. Contractual claims, such as, extension of time with cost claims	2.22	2.59
Information and communication related factors	RII value	
	From respondents	Site investigation
1. Lack of coordination between parties	2.18	3.33
2. Slow information flow between parties	1.823	1.85
3. Lack of communication between parties	1.982	2.22

7. RESULTS AND INTERPRETATION OF DATA (RII TECHNIQUE)

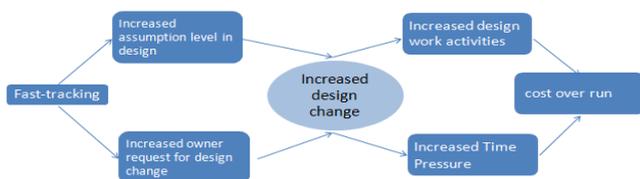
The questionnaires prepared were given to various infrastructure organization professionals such as contractors, Engineers, site supervisors and other staffs involved in fast track projects in the southern part of India. The respondents were requested to read the questionnaire and give scores from 0 to 3 based on the effect for each factor in the given form. From the scores, Relative Importance Index of factors was calculated, based on the RII, ranking was done and categorized to find obtain the most critical factor maong all factors. A total number of 50 questionnaires were distributed and a response of 29 numbers was received. The percentages of response were calculated.

Table - 2: Percentage on Response

Contractor’s site management related factors	2.02
Design and documentation related factors	2.63
Financial management related factors	1.85
Information and communication related factors	2.52
Human resource (workforce) related factors	1.70
Non-human resource related factors	2.44
Project management and contract administration related factors	2.51

7.1 Discussion,

From the table 2, Design and documentation related factors is ranked at top. Design changes occurs through out the project it causes delay in progress and rescheduling it affects the scope of the project and causes major changes in cost



8. CONCLUSIONS

Cost overruns are the most common factor and predominant in fast- track interior fit out projects in India. And during these study attempts was taken to find out the most critical factor which was mostly

influencing the fast – track interior fit out projects. So a questionnaire survey was made across various responants form many organisations . From the study it was observed that many respondents mainly focused on completing the project within the allocated funds to control the cost overrun. The most predominant factors from the study are based on respondents perspective which includes the issues in design changes contract management and material, financial management and payments for completed works (delays in payments).

8.1 RECOMMONDATIONS

Frequent design changes has to be reduced and mistakes and errors can be rectified by usage of codes such as time saver standards etc, delays in design and approval design should have to be controlled and 80% design has to be completed before the execution.

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