

Causes of Cost Overrun in Construction Projects in Ahmedabad

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Abstract— A lot of research & studies have been done to identify the major causes of cost overruns in construction project of Ahmedabad. However, cost overrun is ubiquitous occurrence in construction project & no construction project can be exempted from cost overrun. Many project managers and contractors from the construction industry participated in the questionnaire survey. This paper aims to assemble major factors affecting cost overrun in Ahmedabad. The progressive factors for construction cost overrun based on the current literature will help the construction practitioners to focus on them & reduce the loss of profit due to cost overrun in construction project.

Keywords: Construction Project, Cost Overrun, Questionnaire Survey, Influencing Factors

I. INTRODUCTION

Indian construction industry contributes more than 5% to the nation's GDP & 78% to the gross capital formation. Indian construction industry employs over 30 million people and assets over ₹ 200 billion. In many construction projects engineers and contractors find difficulties like poor planning, bad quality of material, wastage of material, unskilled labors, over budgeting, unexpected weather conditions, conflicts between engineer and contractor etc. These result in cost overrun and conflicts in project. If the completion of project exceeds the planned schedule, the people as well as economy have to wait for the provisions of public goods and services longer than is necessary and hence delays the growth potential of the economy. Due to cost overrun in construction projects it affects the stock market, which is the lifeline of the Indian Economy. The input of the construction industry in growth of national economy requires better efficiency in the industry by means of successful project delivery. Timely completion of construction project within anticipated cost and to the level of quality standard settled by the owner is an index of successful project.

Cost overrun is a variance between initially estimated or projected cost and final cost at the completion of the project. Final costs are described as the total costs actually spent on construction project as determined at the project completion time while, projected or initial cost is known as the planned or predicted costs at the project approval time. The results obtained by the questionnaire survey showed that 80% of the survey respondents reported that they are facing with the issue of cost overrun.

II. LITERATURE REVIEW

1) A quantitative research carried out by Ramanathan et al. (2017) on cost overrun in construction projects identified 18 causes. The findings of his research showed that the main causes of cost overrun were extension of time, fluctuation in cost of raw materials, design changes, unpredictable weather conditions, insufficient project preparations and planning, delay in delivery of raw

materials and equipment to site, lack of cost plan, monopoly by some suppliers in materials, deficiency of coordination at design stage, and re-measurement of provisional sum.

2) Mulenga mukuka et al. (2015) discussed the effect of construction schedule overrun in Gauteng construction projects in South Africa. The data was derived from both primary and secondary sources. The primary was well prepared questionnaire and the secondary data includes detailed literature survey. MIS method was used for data analysis. The study concluded that extension of time, loss of profit, dispute, poor quality of work, claims, delays are the major criteria for project schedule overrun. Extension of time ranked 1(SD=0.829) and the last rank goes to loss of skilled employees (SD=1.077)

III. METHODOLOGY

A. Factors

- 1) Frequent design changes.
- 2) Risk's associated with project.
- 3) Inaccurate evaluation of projects time/duration.
- 4) Tax liabilities.
- 5) Conflict between the project parties (client/contractor).
- 6) Contract & specification interpretation disagreement.
- 7) Increasing (Inflation) of prices.
- 8) Funding problems for the completed work.
- 9) Poor project management/construction management.
- 10) Unskilled labor (manpower).
- 11) Lack of professional software.
- 12) Unstable interest rate.
- 13) Lack of proper regulation in work control.
- 14) Project fraud & corruption.
- 15) Irregular (unstable) government policies.
- 16) Fluctuation in price of raw material.
- 17) Shortage of site workers.
- 18) Equipment failure.
- 19) Payment related problems from owner side.
- 20) Material related problem (Transportation, cost, handling etc.)

B. Procedure

- 1) As a first step, cost influencing factors are well identified through literature review, site engineers, contractors, site engineers, project manager and supervisors.
- 2) The structured questionnaire was prepared by taking into considering all the above factors, along with few more blank points for any other factors which would be included by the technical person.
- 3) Each factor was given a scale of 1 to 5, so that the person could express the severity of impact by an individual factor on cost.
- 4) The whole scale was divided in five parts

- a) 1:- Strongly Disagree
 - b) 2:- Disagree
 - c) 3:- Neutral
 - d) 4:- Agree
 - e) 5:- Strongly Agree
- 5) A total of 87 questionnaire were distributed in the form of Google forms or offline forms to various site engineers, contractors, site engineers, project manager and supervisors.
- 6) The values obtained from the questionnaires were analyzed on the basis of Relative Importance Index (RII).

IV. DATA ANALYSIS

The data was analyzed on the basis of the answer given by the respondents by using Relative Importance Index method (RII).

I distributed over a 91 questionnaire, out of which I received 87 questionnaires. The analysis of these questionnaires helped me to calculate the Relative Importance Index of each factor. I received responses from a pretty diverse group of professionals i.e. engineers, contractors, builders, consultants etc. almost

Also the accuracy of the questionnaire survey depends upon the number of questionnaire i.e. more the number of questionnaires more is the accuracy of the results.

A. Relative Importance Index:

It is used determine the relative importance of the various causes. The same method is going too adopted in this study within various groups (i.e. contractors, project engineers and

client and site supervisor). The five-point scale ranged from 1 (strongly disagree) to 5 (strongly agree) is adopted and transformed to relative importance indices (RII) for each factor as follows:

$$RII = \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n_1}{A \times N}$$

n1= Number of respondents for strongly disagree

n2= Number of respondents for disagree

n3= Number of respondents for neutral

n4= Number of respondents for agree

n5= Number of respondents for strongly agree

A (Highest weight) = 5

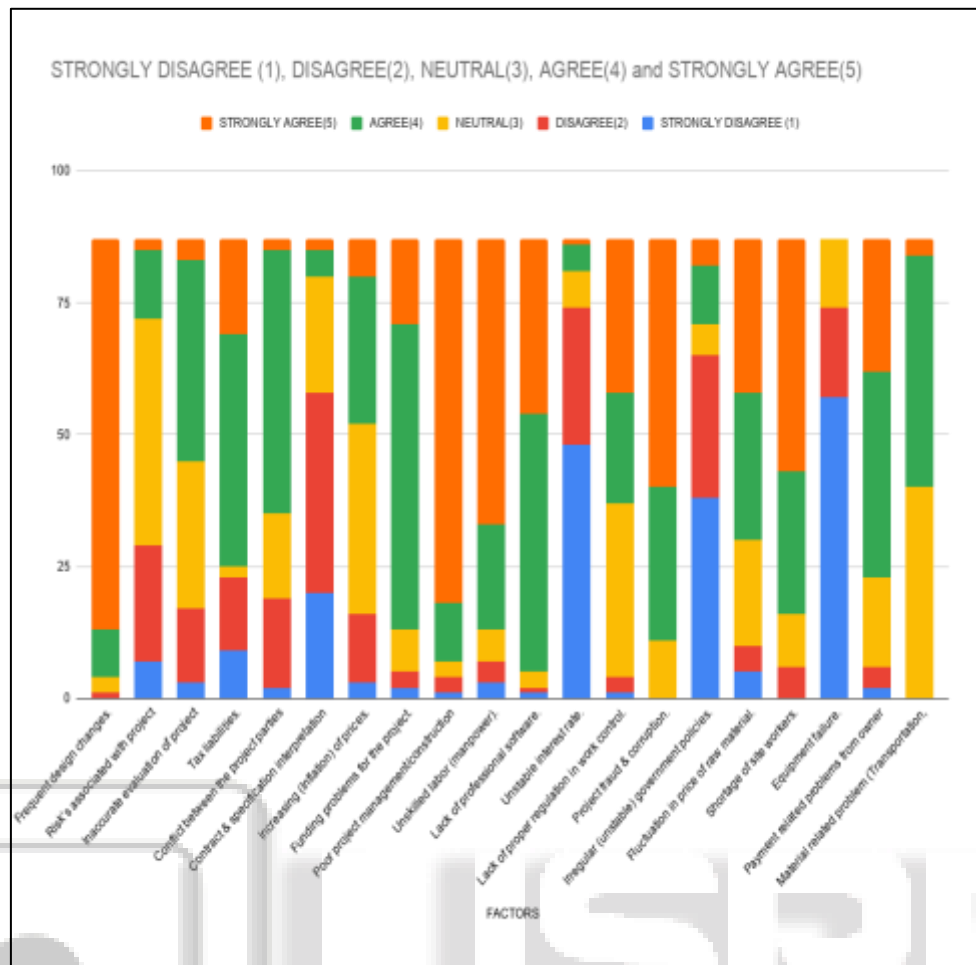
N (Total Number of Respondents) = 87

V. RESULTS & DISCUSSION

This study reveals that there are many varying factors for cost overrun on construction projects. As per the given table below the most responsible factor for construction cost overrun is “Frequent design changes” which have RII value of 0.9586 followed by “poor project management” which have RII value of 0.9310. The factor which is least affected for construction cost overrun is “Equipment failure” which have an RII value of 0.2988.

However to overcome these problems the firm have to focus on (1) Proper design and planning of structure. (2) Regular checks on material pricing (3) use of proper software such as Revit, BIM, Primavera, MS Project etc. (4) establish appropriate communication with all parties (5) regular meeting with the project stakeholders. Cost overrun on projects may not be prevented entirely, but with the growing use of BIM, new methods and experience could be used to reduce the impact of risk factors.

FACTORS	RII	RANK
Frequent design changes.	0.9586	1
Poor project management/construction management.	0.931	2
Project fraud & corruption.	0.8827	3
Unskilled labor (manpower).	0.8712	4
Lack of professional software.	0.8574	5
Shortage of site workers.	0.8505	6
Funding problems for the project.	0.7908	7
Payment related problems from owner side.	0.7862	8
Lack of proper regulation in work control.	0.7701	9
Fluctuation in price of raw material.	0.7632	10
Material related problem (Transportation, Handling etc.)	0.7149	11
Tax liabilities.	0.7103	12
Conflict between the project parties (client/contractor).	0.6758	13
Inaccurate evaluation of project duration.	0.6597	14
Increasing (Inflation) of prices.	0.6528	15
Risk's associated with project	0.5563	16
Irregular (unstable) government policies.	0.4414	17
Contract & specification interpretation disagreement.	0.4113	18
Unstable interest rate.	0.3356	19
Equipment failure.	0.2988	20



REFERENCES

- [1] Abdullah Alhomidan (2013) "Factors Affecting Cost Overrun in Road Construction Projects in Saudi Arabia", International Journal of Civil & Environmental Engineering IJCEE-IJENS Vol: 13 No: 03. (22.08.2014)
- [2] Aljohani, A., Ahiaga-Dagbui, D. and Moore, D., 2017. Construction Projects Cost Overrun: What Does the Literature Tell Us? International Journal of Innovation, Management and Technology
- [3] Shete, A.N and Kothawade, V.D., 2016. An Analysis of Cost Overruns and Time Overruns of Construction Projects in India. International Journal of Engineering Trends and Technology (IJETT)
- [4] Vaardini, U.S, Karthiyayini, S. and Ezhilmathi, P., 2016. Study on cost overruns in construction projects – A review. International Journal of Applied Engineering Research
- [5] Mamata Rajgor, Chauhan Paresh, Patel Dhruv, Panchal Chirag, and Bhavsar Dharmesh "RII &IMPI: Effective Techniques for Finding Delay in Construction Projects", Jan 2016. International journal of engineering and technology (IRJET)
- [6] Ashish D. Joshi, Prof. Dr. S.D. Khandekar, "Project Management for Construction Projects: Improving Project Performance", June 2015. International journal of engineering and technology (IRJET)
- [7] Desai Megha, Dr Bhatt Rajiv "A Methodology for Ranking of Causes of Delay for Residential Construction Projects in Indian Context", March 2013. International journal of engineering and technology (IRJET)
- [8] Sugiharto Alwi ,Keith Hampson "IDENTIFYING THE IMPORTANT CAUSES OF DELAYS IN BUILDING CONSTRUCTION PROJECTS " (2003). International journal of engineering and technology (IRJET)
- [9] An article on Bharat Diamond Bourse by Business Insider Jan 2013.
- [10] A report on A Real-Estate report on Planning Can Help construction workouts by William R. Mawhinney
- [11] Al Momani A.H.(2000),Construction delay: a quantitative analysis,- International Journal of Project Management
- [12] Adam, A, Josephson, P, Lindahl, G. (2014) Implications of cost overruns and time delays on major public construction projects, Proceedings of the 19th International Symposium on the Advancement of Construction Management and Real Estate, Nov 2014, Chongqing
- [13] Albert, P.C. Chan., David Scott & Ada, P.L. Chan (2004), Factors affecting the success of a construction project, Journal of Construction Engineering and Management.
- [14] Mahamid (Sep 2014) 'Common risks affecting time overrun in road construction projects in Palestine: Contractors' perspective', Australasian Journal of Construction Economics and Building.