

Identify the Factors Affecting to Time and Cost Overrun in Road Construction in South Gujarat Region

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Abstract— For developing countries like India, Road construction activities are much affected by cost overrun and time overrun due to various factors throughout the project cycle. The main objective of this study is 1) to identify various factors which are mostly influencing the cost overrun and time overrun of the construction activities, 2) to rank the factors identifies based on their impact, 3) to find out the critical factors which are mostly affecting the construction activities, finally 4) to give recommendations to overcome the critical factors. The primary findings emanating from the study revealed that empirical studies have identified a number of important factors which cause projects cost overruns and time overruns. The primary findings emanating from the study revealed that empirical studies have identified a number of important factors which cause projects cost overruns and time overruns.

Key words: Cost Overrun, Time Overruns, Road Projects

I. INTRODUCTION

Indian road network is the second largest network in the world just after United States. It stretches about 48, 65,000 Kilometers in the year 2014 and also having a chance of increasing year by year. The Government of India takes initiatives to improve and increase the infrastructure facilities for better, smooth and modern transportation. Road construction is the one of the most important parts of infrastructure. The deviations between the actual cost incurred during construction phase and originally estimated cost is known as cost overrun and it is one of the most predominant factors affecting the successful completion of the overall project. In most of the Indian road construction activities, it was observed very few projects were completed in a planned manner within estimated cost. Due to the major problems and delays in construction, most of the projects were suffered from cost overrun issue due to many reasons such as ineffective planning, monitoring and execution of work. Better planning of cost and allocation of funds are to be achieved to complete the project task with high precession. It is found that, understanding fundamentals of such factors is important role of construction manager for avoiding or minimizing cost overruns and better cost performances. Questionnaire survey and personal interviews are the also main objectives of this project study. This study is based on questionnaire survey within south Gujarat Region only in Road construction. The most crucial find out separately from Rigid and Flexible Pavement and to be filled by Engineer, Project Manager and Contractor. Finding out the causes of cost overrun, time overrun and rectification of the causes will be very useful to achieve the goals; scope of the project, to maximize the return on investment, to complete the project within actual budgeted cost and to

minimize the wastage of funds, will avoid such critical instances to occur in future.

II. OBJECTIVES

This research attempts to:

- 1) To identify the factor that affects the time and cost overrun in road construction.
- 2) To analyze the most crucial factors which affected to time and cost overrun from different respondent's perspective in road construction.

III. LITERATURE REVIEW

Rajakumar A C (2016) defined factors influencing to time overrun and cost overrun, during these study efforts was taken to find out the most critical factor which was mostly influencing the Indian road projects. So a questionnaire survey was made across various Government and private organizations. From the study it was observed that many respondents mainly focused on completing the project within the budget to control the cost overrun. The most predominant factors from the study are based on respondents perspective which includes the issues; (1) land acquisition, (2) cost escalation of workers' wages and material, (3) financing and payments for completed works, (4)delays in shifting existing utilities, (5) increase in quantities of materials due to actual site conditions, (6) non-availability of construction materials, (7) design errors, (8) unstable or increase in interest rates.

Ms.Yogita Honrao, Prof.D.B.Desai (2015) in their study reducing the delays in highway construction project is to understand the root causes of the delay. The results provide a listing of root causes and issues that are directly responsible for most infrastructure construction project delays. It was concluded that there are many causes of delay related to contractors such as Ineffective construction method implementation, Shortage of materials. cost and time overruns and disruption of traffic movement were the most frequent effects of delay.

Ibrahim Mahamid, Amund Bruland (2011).they studied importance of the causes affecting cost estimating accuracy. The importance index of each cause is calculated. 51 causes of cost overrun were identified through research. The identified causes are combined into five groups. - The findings reveal that the top five affecting factors from consultants' view are: (1) materials price fluctuation, (2) insufficient time for estimate,(3) experience in contracts,(4) size of contract, (5)incomplete drawings.

Asish Ram, Dr. Pratheeba Paul (2010) they reducing the delays in infrastructure construction project is to understand the root causes of the delay. The results provide a listing of root causes and issues that are directly responsible for most infrastructure construction project

delays. Additionally, it is found that fundamental principles must be adopted before significant improvements can be made.

Siraw Yenesew Tesfa(2013) Causes of delay are related with both the owners, contractors, consultants and slightly with external factors. It should be noted that owner, contractors, consultants and even the economy of the city and the country are all affected by the problem of untimely delivery of these projects. There is no strong correlation on the responses of owner, contractor and consultant respondents, i.e. between owner versus contractors and owner versus consultants; but there is a strong correlation on the responses of contractor and consultant respondents. - there are following top five factors affecting :(1)slow site clearance(2)contractors financial problems(3)inflation (4) progress payments delay(5) financial problems

Remon F. Aziz ,Asmaa A. Abdel-Hakam(2016)They conclude that The owner financial problems make it important to pay the contractor's dues on time to make it easy the contractors ability to finance the work. Inadequate contractor experience (work) causing error makes it necessary to choose a contractor with a good reputation and sufficient experience in the field of work. Shortage in construction materials like Bitumen in the road constructions can cause a big delay especially when the shortage is because of the prices fluctuation. Prices differences should be considered in the contracts. there are following top five factors- (1) Political situation, (2) segmentation of the west bank and limited movements between areas, (3) Award project to lowest bid price, (4) Progress payment delay by owner, (5) shortage of equipment

IV. RESEARCH METHODOLOGY

Research methodology of this study contains three main steps. First step includes literature Survey. The literature review was conducted through research papers, journals, internet, etc. Second step includes the non-structured interviews conducted with experts in construction industry as road contractors, site in charges, senior engineers. According to their suggestions and literature review, questionnaire was designed for survey. Questionnaire includes various interface (co-relationship) problems that exist during project life cycle. Questionnaire was distributed to expert participants of south gujrat to ask for their responses. Third step contains result analysis of collected data and conclusion with relative importance index method (Fagbenle et al., 2004):

$$RII = \frac{\sum W}{A * N}$$

Where W, is the weighting given by each respondent to each problems. A is the highest weight (i.e. 4 in our case) and N is the total number of the respondents.

V. QUESTIONNAIRE DESIGN

The questionnaire is divided into four main parts. Section- A gives introduction of criteria that affects the time and cost overrun. Section- B is related to respondent's details. Section- C includes the list of the influencing factors which are exists during road construction. In Section- C, the respondent is provided with a Likert scale ranging from 1-

not important to 4- extreme important. Respondents has to give importance rank to each interface problems for its effect on project's cost, time and quality and overall impact separately.

VI. RESULT & DISCUSSION

Table 1.1 shows that Based on data collection by 15 contractors respondents, 57 factors were evaluated and ranked for most affecting factor in road construction. On results by RII method, top 10 factors are listed below

RANK	FACTORS	R.I.I
1	Financial status of owner	0.96
2	Suspension of work by owner	0.946
3	Contractors financial problems	0.933
4	Budget availability for the project	0.933
5	Inaccurate cost estimation	0.92
6	Payment delay	0.92
7	Progress payments delay by owner	0.893
8	Payment problems between contractor and his employees	0.893
9	Poor site management and supervision by contractor	0.893
10	Quality of material	0.88

Table 1: Contractors Ranking By R.I.I Method

Table 1.2 shows that Based on data collection by 22 Engineers respondents, 57 factors were evaluated and ranked for most affecting factor in road construction. On results by RII method, top 10 factors are listed below

RANK	FACTORS	R.I.I
1	Budget availability for the project	0.936
2	Financial status of owner	0.918
3	Contractors financial problems	0.909
4	Quality of material	0.89
5	Shortage of manpower	0.89
6	Unforeseen site conditions	0.872
7	Delay in issuing instructions and approvals	0.872
8	Estimating method used	0.863
9	Inaccurate cost estimation	0.854
10	Experience in contracts	0.854

Table 2: Engineers Ranking By R.I.I Method

TABLE 1.3 shows that Based on data collection by 24 supervisors respondents, 57 factors were evaluated and ranked for most affecting factor in road construction. On results by RII method, top 10 factors are listed below

RANK	FACTORS	R.I.I
1	Quality of material	0.933
2	Progress payments delay by owner	0.925
3	Payment delay	0.908
4	Contractors financial problems	0.9
5	Financial status of owner	0.875
6	Budget availability for the project	0.875
7	Experience in contracts	0.866
8	Delay in issuing instructions and approvals	0.858
9	Inexperienced contractor's manpower	0.85
10	Poor site management and supervision by contractor	0.841

Table 3: Supervisors Ranking By R.I.I Method

RANK	FACTORS	R.I.I
1	Financial status of owner	0.793
2	Budget availability for the project	0.783
3	Suspension of work by owner	0.780
4	Experience in contracts	0.747
5	Lack of application of risk management process	0.747
6	Payment delay	0.744
7	Interference by the owner during execution operation	0.721
8	Change of project scope	0.714
9	Contractors financial problems	0.711
10	Delay in decision making by the owner	0.701

Table 4: Top 10 Factors Overall Ranking by R.I.I Method

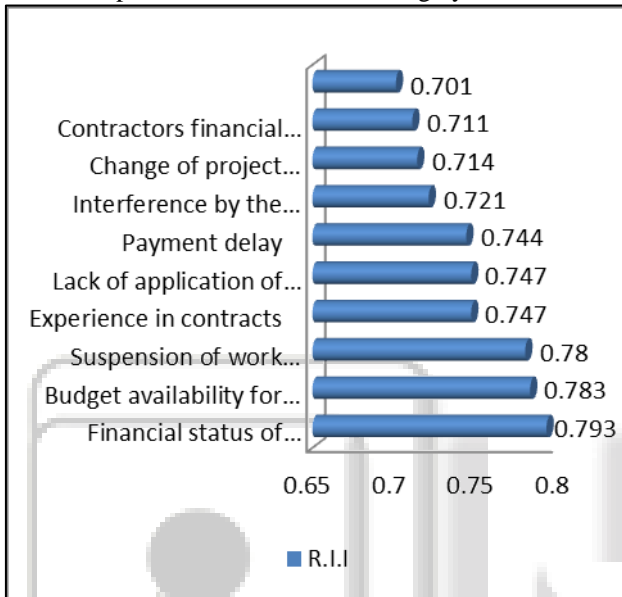


Fig. 1: Graphical representation overall ranking by R.I.I method

VII. CONCLUSION

Overall combined ranking considering the perception of all the stakeholders is done. Top 10 most crucial factors have been identified which is affected to time overrun and cost overrun in road construction in south gujrat region. In the decreasing order ranking of the factors for combined stakeholders are :financial status of owner, Budget availability for the project, suspension of work by owner, experience in contracts, Lack of application of risk management process, payment delay, interference by the owner during execution operation, change of project scope, contractors financial problems, delay in decision making by the owner. Rank of each factors and their importance is identified by the Relative importance index (R.I.I) Method. By improving in above listed top factors Time and Cost overrun can be minimized.

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