# Cost and Time Overrun Analysis in Construction Industry Using Questionnaire Survey

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Abstract — Delay of a construction project is defined as late completion of the project as compared to the planned schedule. A study is carried out on construction schedule delays and various delay analysis techniques to evaluate the causes of delay and their impacts in the construction project. Then a survey is conducted at various project sites using a questionnaire to find the major causes of delay faced during planning, construction and post construction stages by Client, Contractor, Project manager, and Owner. Then using a ranking method based on relative importance the major cause of delay is found. Thus determination of delays caused in finished construction projects helps in the scheduling of work timetable to a new construction project in an economically efficient and time saving way.

**Key words: Cost analysis, Time analysis, Construction Industry** 

# I. INTRODUCTION

In construction, delay could be defined as the time overrun either beyond completion date specified in a contract or beyond the date that the parties agreed upon for delivery of a project. It is a project slipping over its planned schedule. The delay in the project has an adverse effect on project success in terms of time, cost and quality. The objective of the project is To identify delay factors in construction projects, to rank the delay factors according to the importance level on delays in project, to find the tools to analysis and evaluate the time delay factors in the building &recommendations to control during construction phase for construction project.

## II. METHODOLOGY

This study is based on the analysis of data collected from the completed project. So, it needs proper monitoring and analysis of the construction project. The data has been collected by tendering department, contractor, account department and interviewing the officials of the construction companies, a study has broadly undertaken as follows:

- 1. Identify the project for the case study of time and cost overruns.
- 2. Proper studying of all available plans, schedules, estimates and work procedures details and collected all relevant data about the project.
- 3. Find out different factors causing schedule delays and cost overruns in construction projects by using the literature review.
- 4. Carefully prepared a questioner of 81 factors from previous investigations and literature reviews
- 5. Questionnaire was distributed to 15 members (design department, senior engineers, contractors, marketing department, assistant engineers, accounts, quality department, quantity department, a project in charges) who are worked for the project through online with the help of Google form. Questioner was organized in the form of scaling (1=very low, 2=low, 3= Medium, 4= high, 5=very high).
- 6. Analyze the data obtained from the survey and finding the important factors which are majorly caused using RELATIVE IMPORTANCE INDEX METHOD (RII) for schedule delay and cost overruns.
- 7. Listed out all shortcomings and make final conclusions and suggest possible remedial solutions for the upcoming projects.

Formula: Relative importance index method (RII),  $\sum W \div A \times N$ , Where, W is the weighting given to each factor by the respondents ranging from (0-5), A is the highest weight (i.e., 5) in this case and N is the total number of respondents. Higher the more value of RII, more important was the cause of delays and cost overruns. The RII was used to Rank different causes this rankings made it possibly to cross

compare the relative importance of the factors are perceived by the three groups.

# III. QUESTIONNAIRE SURVEY

This questionnaire consists of 63 causes of delay on which a detailed analysis will be carried out by using statistical concept. These causes are classified into 9 groups according to the sources of delay: factors related to project, owner, contractor, consultant, Architect/design team, materials, equipment, manpower and external factors. Data collection is the most critical part of the study since the accuracy of the data will determine the success or failure of the research. The data are obtained through literature studies and questionnaires that would be analyzed using appropriate analysis techniques in order to portray a clear perspective on performance management. Responses from the questionnaire will then be compiled and analyzed.

#### PHASE-I

1. What is your Profes	sion/Occupation	?			
Architecture		Engineering			
Quantity Surveying		Project Managemen	ıt		
Contracting		Facilities Managem	ent		
Real Estate		Civil Servant			
Other (please specify		).			
2. What is your educat	ional qualificatio	on?			
Diploma	Degree	Masters	Ph.D		
Other (Please specify			)		
3. What is your experience.	ence?				
0 –5 years	6-10  years	11-15 years	Over 15 years		
Questionnaire survey format sample 1					

#### PHASE-II

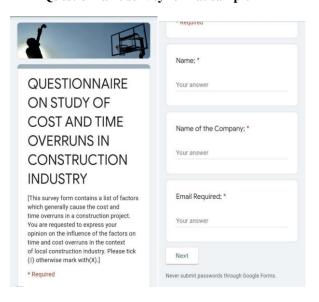
1. How would you rank the influence of these factors on time and cost overruns in planning stage in the public sector construction industry?

	Likert's Scale					
PLANNING STAGE	0	1	2	3	4	5
a. Inadequate brief						
b. Inadequate specification						
c. Use of Standard Documentation						
d. Late Consultation with planning authority						
e. Inaccurate estimates						
f. Difficulties in a choice of site						
g. Inexperience of the Consultants						
h. Changes in key personnel						
i. Other (please specify)						

2. How would you rank the influence of these factors on time and cost overruns in construction stage in the public sector construction industry?

				Likert	's Scale		
	CONSTRUCTION STAGE		1	2	3	4	5
.,	Difficulties in financing project by contractor						
FRACTOR	Conflicts in subcontractors schedule in execution of the project						
CONTR	Rework due to errors during construction						
	Poor site management and supervision by the contractor						

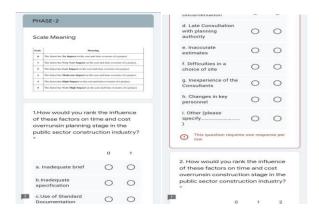
### Questionnaire survey format sample 2

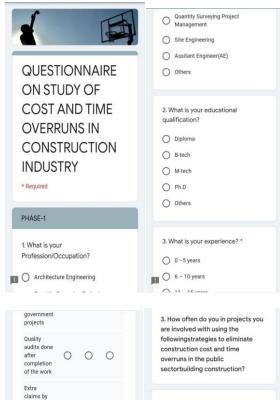


#### IV. DATA COLLECTION AND RESULTS

We have conducted the survey for various company employees. Here we have collected the data in the form of Google forms.

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government projects				How often do you in projects you are involved with using the
Quality audits done after completion of the work	0	0	0	followingstrategies to eliminate construction cost and time overruns in the public sectorbuilding construction?
Extra claims by the owner at the end of the project	0	0	0	a. Avoiding earthwork and substructure construction activity during rainyseason.*
Contractual claims, such as, extension of time with cost claims	0	0	0	Frequently Occasionally Rarely Never
ver submit password  This content is nei Google. Report Abu	ther create	ed nor er of Servi	ndorsed by ice - Privacy	b. Providing facilities and accommodation for workers to avoid or minimisetrade absenteeism.      Frequently      Occasionally

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construction	mail.com	

# **Response Sheet**

		Kesponse a	Sneet	
EXP.	DATE & TIME	PROFESSIO N	PLANNING : HOW WOUL RANK	D YOU
			Inadequat e proof	Inadequa te specificat ion
	25/04/202 1.	Quantity		1011
06-10 YEARS	14:45;18	surveying	2	4
	27/04/202 1.	Quantity		
0-5 YEARS	13:50:19	surveying	3	4
	28/04/202 1.	Assistant		
0-5 YEARS	11.13.20	Engineer	5	3
	28/04/202 1.	Assistant		
0-5 YEARS	18:20:16	Engineer	1	4
	30/04/202 1. 12:26:10			
06-10 YEARS	12:26:10	Others	2	5
	01/05/202 1.			
0-5 YEARS	18:46:23	Others	4	5
	02/05/202 1.	Quantity		
0- 5YEAR S	15:15:38	surveying	4	4
	04/05/202 1.			
6-10 YEARS	19:55:48	Site Engineer	3	4
	06/05/202 1.	Quantity		
0-5 YEARS	12:38:55	surveying	5	4
	06/05/202			

	1.			
0-5 YEARS	10:44:23	Site Engineer	4	4

Analysis of respondents

So based on response got from various experience persons from google forms which is shown in above tables (those response will get in google forms) we need to calculate RII by usingfollowing formula Relative importance index method (RII)

 $\sum W \div A \times N$ 

NO	FACTOR	RII	PERCENTAGE (%)
1	Inadequate specification	0.82	82
2	Use of standard documentation	0.82	82
3	Rework due to errors during construction	0.94	94
4	Delay in obtaining permits from municipality	0.8	80
5	Weather effect on construction activities	0.9	90
6	Unqualified workface	0.76	76
7	Quality audits done after completion of the work	0.82	82

## Causes of delay based on RII

So after Calculation RII Based on the response got from Questionnaire survey we will able to identify Various causes of delay which are responsible for Time over run and cost Overrun so if we overcome those kind of causes then we can able to solve most of the problems in construction industry. In order to solve those kinds of problems certain recommendations have been suggested based on experience we got from various engineers, which is shown below

CAUSES OF	RECOMMENDATIONS
DELAY	
Weather	Conducting detailed and perfect surveys
Conditions	towards the field and previous weather
	data
Labour	Early work force planning is essential
shortage	for owner and contractors to effectively
	manage project labour risks. Then
	providing incentives/awards for workers
	like best employer of the year /month so
	that productivity and quality work will
	beincreased.
Improper	Understand the level of supply and to
planning	produce detail planning and schedule.
Lack of	Site management should be properly
facilities at site	done to ensure power resource; basic
	facilities for worker are available to
	increase productivity by doing detail

	study in site conditions.
Material	Materials and machinery management
storage	is an important factor, material needs
	to be checked upon the delivery to
	ensure material quality at an early
	stage thus the replacement of the
	defect materials should be done
Lack of funds	Optimize cash flow in accordance
	with the requirements and make sure
	fund needed for the projects is
	available to execute the project
Inspection	After the completion of construction
and	inspection is done so that the project is
permission	doneaccording to the guidelines
from	
municipal	
authority	

#### V. CONCLUSION

Every successful execution of the project, material management plays a crucial role and the utilization of equipment and the materials in the proper way leads to the success of the project. The result shows that many of the problems in construction industry mainly come from the execution of the project. Project execution requires controlling these kinds of factors to overcome this overruns, project management techniques of planning, controlling, monitoring, procedures are needed to be implemented.

Finally, we concluded that there are many factors which affect the cost and time overrun to some extent. Some of those factors are frequent design change by owner, poor maintenance of safety stock level, In use of advanced engineering design software, poor site management and supervision by contractor, equipment unavailability and failure, escalation of material prices affects project cost, ineffective planning and scheduling, decrease in rate of labour productivity mostly affect the time and cost overrun.

So some of the measures should be taken such as

- 1 Paying a lot of attention to project planning.
- 2 Material prices and labour rates should be updated continuously.
- 3 Resources should be readily available at site.
- 4 Attempt to stay within the scope that was originally planned.

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