International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 08 Issue: 06 | June 2021 www.irjet.net p-ISSN: 2395-0072

CAUSES OF TIME OVERRUN IN CONSTRUCTION PROJECTS

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Abstract - *This disquisition presents a study made on the factors, causes, and effects of time overrun in the construction industry. The favorable outcome of the project depends on the time, quality and work done within the budget of the client. Schedule overrun is being one of the remarkable complications faced by the construction industry nowadays. There are numerous reasons and factors responsible for the schedule overrun which needs to be given priority and solved in order to complete the given project on time and for the satisfaction of the client. Infrastructure plays a predominant role in economic upswing of the country. The aim of this research is to identify the reasons responsible for time overrun in the construction projects. By this research we would be able to give attention to collaborators to drop down the factors of time overrun in construction projects.*

***Key Words*: Time overrun, Construction projects, Cause, effect, factors.**

1.INTRODUCTION

The Construction Industry is one of the most thriving industries in the whole world. This industry is mainly linked with the construction and development of real-estate properties. The Construction Industry is one of the loading industries in providing employment to people and plays a compelling role in the economic upswing of the country. Project overrun because of time and cost is the reason for the delay in the completion and execution of the country. In context to the Construction Industry , delay can be defined as the extension of time in the completion of the project. In short delay means failing to complete the project in the desired time period. The existence of this delay impacts the completion of the project within the time period. In order to avoid this issue, the foremost step is to identify and mitigate the issues that require serious attention.

2. OBJECTIVES

The main purpose of this paper study is the following:

1. To identify the factors responsible forschedule overrun in construction projects.
2. To sort the time overrun reasons and give the conclusion.
3. Insufficient management of Project design/scope change is widely prevalent in the Infrastructure Sector, availability of resources, poor site management are several reasons which need to be solved.

3. LITERATURE REVIEW

The project time overrun and cost overrun problem is faced by numerous countries and the study on the causes of these problems is also conducted such as India(Singh R,2010) , Jordan(Sweis G, Sweis R, Hammad A, and Schboul A 2008). In order to achieve high productivity and best performance , it is necessary to eliminate the factors that affects the escalation of the projects and the results in the delay in completion of the project in the targeted time.

Singh R (2010) studied delays and cost overrun in 894 projects tells that delays are one of the most crucial causes behind the cost overrun. The bigger projects have experienced much high cost overrun compared to smaller ones.

4. DELAY TYPES

Delays are classified into different types :

1) **Inexcusable (Contractor)**
2) **Excusable**
   - **(a) Compensable**
   - **(b) Non Compensable**
3) **Concurrent**

Delays that affect project completion dateas decided on the contract are called as Critical delays, while the delays that do not affect project completion date are called as non critical delays. An excusable delay is not under control. This delay is due to the unforeseeable activity beyond the contactors or the Sub Contractors control. Excusable delays without the compensation delays caused by neither the Client nor the Contractor.

5. FACTORS CAUSING TIME OVERRUN

Table-1 Factors Causing Time Overrun

S.N0	CAUSES OF TIME OVERRUN
1.	Poor site management of the contactor
2.	Financial Difficulties faced by the Contractor
3.	Increase in cost of materials
4.	Contractor is not well experienced
5.	Impact of the weather conditions
6.	Lack of availability of skilledlabour
7.	Mistakes in the design
8	Weak project planning
9.	Poor time estimation of projecttasks
10.	Delay in delivery of the materials
11.	Lack of materials
12.	Insufficient number of equipments
13.	Lack of productivity of the equipment
14.	Delay caused in inspection and approval of the completed works
15.	Variation in price of the materials
16.	Frequent changes made in the design and incomplete design atthe time of tender.
17.	Changes made in the specificationof the materials
18.	Delay in the progress payment bythe owner
19.	Interference of the owner

6. RESULT ANALYSIS

Assessment of causes of cost overrun was carried out using 5 Point Likert's scale from 1 to 5 representing can be Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree respectively. Data analysis was done calculating Relative Importance Index (RII) by following formula, **Relative Importance Index (RII)** is best suitable method to do the ranking analysis.

The questionnaires were distributed to project managers, engineers, owners and contractors of various construction projects. The characteristics of the respondents participated in the questionnaire survey are summarized and showed in Table I and it indicates that majority of the respondents are consultants followed by contractor and client. The respondents participated in the survey are categorized according to their designation and experience.

Table-2 Respondents Demographics & Respondents Work Experience

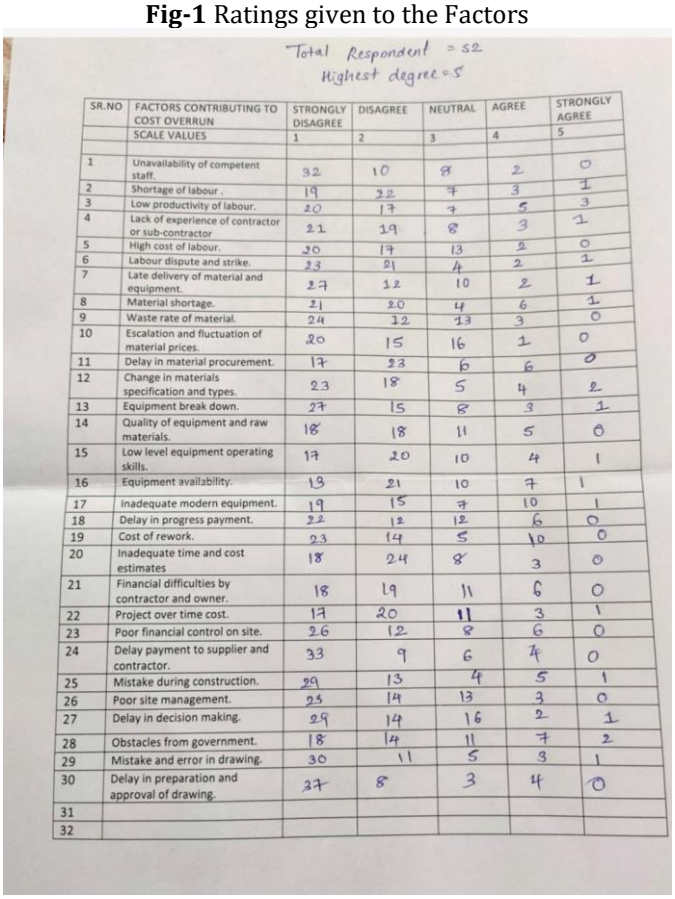
Experience (years)	Number of Respondents
<3	1
3-5	5
5-10	18
10-15	26
>15	2
Total	52

Table-3 Number of Respondents

Engineer	17
Project Manager	13
Contractor	15
Owner	3
Total	**52**

7. POST DATA ANALYSIS

Fig-1 Ratings given to the Factors



Total Respondent = 52
Highest degree = 5

SR.NO	FACTORS CONTRIBUTING TO COST OVERRUN	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
	SCALE VALUES	1	2	3	4	5
1	Unavailability of competent staff.	32	10	8	2	0
2	Shortage of labour .	19	22	7	3	1
3	Low productivity of labour.	20	17	7	5	3
4	Lack of experience of contractor or sub-contractor	21	19	8	3	1
5	High cost of labour.	20	17	13	2	0
6	Labour dispute and strike.	23	21	4	2	1
7	Late delivery of material and equipment.	27	12	10	2	1
8	Material shortage.	21	20	4	6	1
9	Waste rate of material.	24	12	13	3	0
10	Escalation and fluctuation of material prices.	20	15	16	1	0
11	Delay in material procurement.	17	23	6	6	0
12	Change in materials specification and types.	23	18	5	4	2
13	Equipment break down.	27	15	8	3	1
14	Quality of equipment and raw materials.	18	18	11	5	0
15	Low level equipment operating skills.	17	20	10	4	1
16	Equipment availability.	13	21	10	7	1
17	Inadequate modern equipment.	19	15	7	10	1
18	Delay in progress payment.	22	12	12	6	0
19	Cost of rework.	23	14	5	10	0
20	Inadequate time and cost estimates	18	24	8	3	0
21	Financial difficulties by contractor and owner.	18	19	11	6	0
22	Project over time cost.	17	20	11	3	1
23	Poor financial control on site.	26	12	8	6	0
24	Delay payment to supplier and contractor.	33	9	6	4	0
25	Mistake during construction.	29	13	4	5	1
26	Poor site management.	23	14	13	3	0
27	Delay in decision making.	29	14	16	2	1
28	Obstacles from government.	18	14	11	7	2
29	Mistake and error in drawing.	30	11	5	3	1
30	Delay in preparation and approval of drawing.	37	8	3	4	0
31						
32						

Fig-2 Formula to Calculate RII value

- RII = ΣW / (A*N)
- Where
- W = Weightage given to each factor by the respondents
- A = Highest weight (i.e., 5 in this case)
- N = the total number of respondents
- Therefore , solving our first factor according to the RII method we get,
- RII= ((1*32)+(2*10)+(3*8)+(4*2)+(5*0))/(5*52)=0.3230

SR.NO	FACTORS CONTRIBUTING TO COST OVERRUN	RELATIVE IMPORTANT INDEX – (RII)	RANK
1	Unavailability of competent staff.	0.3230	28
2	Shortage of labour .	0.3884	17
3	Low productivity of labour.	0.4230	6
4	Lack of experience of contractor or sub-contractor	0.3846	19
5	High cost of labour.	0.3884	18
6	Labour dispute and strike.	0.3461	26
7	Late delivery of material and equipment.	0.3615	24
8	Material shortage.	0.3923	13
9	Waste rate of material.	0.3807	21
10	Escalation and fluctuation of material prices.	0.3923	14
11	Delay in material procurement.	0.4038	12
12	Change in materials specification and types.	0.3846	20
13	Equipment break down.	0.3769	22
14	Quality of equipment and raw materials.	0.4115	8
15	Low level equipment operating skills.	0.4153	7
16	Equipment unavailability.	0.4538	2
17	Inadequate modern equipment.	0.4423	4
18	Delay in progress payment.	0.4076	11
19	Cost of rework.	0.4076	10
20	Inadequate time and cost estimates	0.3923	15
21	Financial difficulties by contractor and owner.	0.4346	5
22	Project over time cost.	0.4115	9
23	Poor financial control on site.	0.3769	23
24	Delay payment to supplier and contractor.	0.3269	27
25	Mistake during construction.	0.3538	25
26	Poor site management.	0.3923	16
27	Delay in decision making.	0.4538	1
28	Obstacles from government.	0.4500	3
29	Mistake and error in drawing.	0.3230	29
30	Delay in preparation and approval of drawing.	0.3000	30

Fig-3 RII value of each Factor

SR.NO	EFFECTVENESS OF FACTORS	RANK
1.	Delay in decision making.	1
2	Equipment availability.	2
3	Obstacles from government.	3
4	Inadequate modern equipment.	4
5	Financial difficulties by contractor and owner.	5
6	Low productivity of labour.	6
7	Low level equipment operating skills.	7
8	Quality of equipment and raw materials.	8
9	Project over time cost.	9
10	Cost of rework.	10
11	Delay in progress payment.	11
12	Delay in material procurement.	12
13	Material shortage.	13
14	Escalation and fluctuation of material prices.	14
15	Inadequate time and cost estimates	15
16	Poor site management.	16
17	Shortage of labour .	17
18	High cost of labour.	18
19	Lack of experience of contractor or sub-contractor	19
20	Change in materials specification and types.	20
21	Waste rate of material.	21
22	Equipment break down.	22
23	Poor financial control on site.	23
24	Late delivery of material and equipment.	24
25	Mistake during construction.	25
26	Labour dispute and strike.	26
27	Delay payment to supplier and contractor.	27
28	Unavailability of competent staff.	28
29	Mistake and error in drawing.	29
30	Delay in preparation and approval of drawing.	30

Fig-4 Ranking of each Factor

8. SITE VISIT

FIG-5 Interaction with Engineer of Casa Rivera

Fig-6 Sygnora Sky Residential Building

Fig-7 Shreepad Group Site

Fig-8 Interaction with Engineer of Shreepad Group

Fig-9 Interaction with Structural Engineer of Magestic Icon

Fig-10 Outside view of Casa Rivera

9. CONCLUSION

The data has been collected from the multiple sources i.e from research papers, articles, newspapers, experts, professionalsetc. Lack of human resources emerged as the most significant factor and had the highest degree of agreement among all thepeople involved in the construction sector. Poor site management came out to be the second most significant factor andreflected an agreement between the clients and consultants but the contractors differed in opinion. Lack of communication between the construction parties was the third most significant factor. Delay in progress of payment by the Owner, financial difficulties faced by contractors and the owner, Delay inhanding over the site to the contractor and inadequate experience and skills of the contractor had a very high degree of disagreement between client and contractors. This indicates Conflict between the client and contractor. Bad weather conditions were moderatelysignificant for both the client and the contractor, but the consultants considered it least significant. This indicates that the consultants more often do not consider theexternal factors during planning.

The issue of Time overrun in any sort of project is a longstanding one. This study on the Causes of Time Overrun in Construction Projects in Surat City has identified and analysed major factors of Time overrun. It was Observed that Delay in decision making, Equipment unavailability, Obstacles from Government, Inadequate modern equipment, Financial Difficulties faced by the Contractor were found to be most major and effective according to ranking 1 to 5.

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