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Causes of Delays in Indian Construction Industries

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Abstract*: *Delay in Building Construction Project is one of the most common problems. Delay can be defined as time overrun or extension of time to complete the project. Delay is situation when the actual progress of a construction project slower than the planned schedule or late completion of the projects. The causes of delay in Building Construction Projects are taken from the pass literature review. The literature reviews are summarized and the delay framework is constructed based on literature review summary.

Keywords: Construction, Building, Delay, Time, cost.

I. INTRODUCTION

Delays are one of the biggest problems facing by the construction industry. The delays in construction projects have significant financial and social impact to all parties involved in the projects. Construction delay is a major problem facing by the construction industry. In most construction projects, there are delays and their impact level varies from project to project ranging from a few days to years. It is generally understood that the construction delay is the most critical factors affecting to deliver the project in time, within budget, and expected quality. It can be found rarely that a project was completed within the specified time. There are various negative effects of delays such as lawsuits between owners and contractors, increased costs, loss of productivity and revenue, and contract termination. Effects of delays which predominantly affects are loss of Interest by the Stakeholder, blacklist by Authorities, waste of Money and Time, Declination of Reputation etc. Delays caused by contractors can generally be attributed to poor managerial skills. Lack of planning and a poor understanding of accounting and financial principles have led to many a contractor's downfall. In this study, most critical factors causing delay and their effects in large residential construction projects in India.

II. OBJECTIVE OF STUDY

A. To identify the source of delays for construction projects.
B. To study cost of delay and methods to mitigate delays.
C. To study the effect of delays for construction projects
D. Analysis of data collected of live projects regarding delays of activity.
E. Give the discussion and suggestion for minimum of effects of delays for construction projects.

III.TYPES OF DELAY

Many construction projects suffer from delay. Suspension means stoppage of work directed to the contractor by a form from the client, while delay is a slowing down of work without stopping it entirely

A. Critical or Non-Critical Delays

Delays that affect the project completion or in some cases a milestone date are considered as critical delays, and delays that do not affect the project completion, or a milestone date, are noncritical delays.

B. Excusable or Non-Excusable Delays

All delays are either excusable or non-excusable. An excusable delay is a delay that is due to an unforeseeable event beyond the contractor's or the subcontractor's control.

C. Compensable or Non-Compensable Delays

A compensable delay is a delay where the contractor is entitled to a time extension and to additional compensation. Relating back to the excusable and non excusable delays, only excusable delays can be compensable. Compensable delays are caused by the owner or the owner's agents.

D. Concurrent or Non-Concurrent Delays

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The concept of concurrent delay has become a very common presentation as part of some analysis of construction delays. The concurrency argument is not just from the standpoint of determining the project's critical delays but from the standpoint of assigning responsibility for damages associated with delays to the critical path.

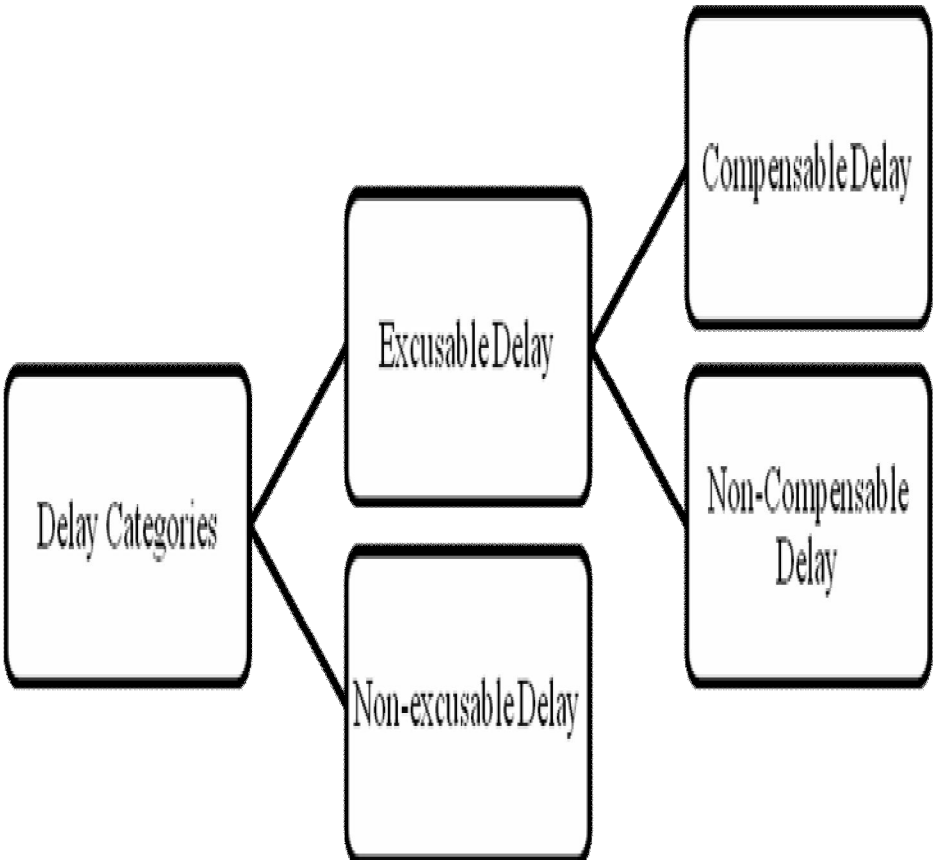

Fig 1. Types of delays

1) Causes of Delay:
a) Project related delay
b) Owner related delay
c) Contractors related delays
d) Consultant related delays
e) Design related delay
f) Material related delays
g) Equipment related delays
h) Labour related delays
i) External factors related delays

2) Effect of Delay:
a) Overtim
b) Over cost
c) Dispute
d) Total abandonmen
e) Litigatio
f) Arbitration

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IV.LITERATURE REVIEW

TABLE 1 PAST LITERATURE

Year	Title of Research
2005	Time–Cost Relationships in Australian Building Construction Projects (Peter E. D. Love; Raymond Y. C. Tse; and David J. Edwards)
2006	Construction Delays and Their Causative Factors in Nigeria (Ajibade Ayodeji Aibinu and Henry Agboola Odeyinka) The study analyzed quantitative data from completed building projects to assess the extent of delays, and data obtained from a postal questionnaire survey of construction managers to assess the extent to which 44 identified factors contributed to overall delays on a typical project they have been involved with. The findings showed that the factors could be prioritized. Critical Factors Affecting Schedule Performance Evidence from Indian Construction Projects (K. C. Iyer and K. N. Jha) This paper identified 55 attributes responsible for impacting performance of the projects in India.
2008	Causes of Delay in Building Construction Projects in Egypt (M. E. Abd El-Razek; H. A. Bassioni; and A. M. Mobarak)
2010	Causes of Delay in the Planning and Design Phases for Construction Projects (Jyh-Bin Yang and Pei-Rei Wei)This paper study identified the delay causes and analyzed the importance and frequency of delay using the relative importance index.
2011	Cause of Construction Delay – Theoretical Framework N. Hamzaha, M.A. Khoirya, I. Arshada, N. M. Tawilb and A. I. Che Anib
2012	Doloi H. et al (2012) -. Factor analysis and regression to modeling were used to examined the significance of their factors
2013	Analysis of Causes of Delay and Time Performance in Construction Projects (Pablo González; Vicente González, Ph.D.;Keith Molenaar, Ph.D., M.ASCE; and Francisco Orozco, Ph.D.) Quantification of Delay Factors Using the Relative Importance Index Method for Construction Projects in Turkey (Murat Gunduz, Ph.D., A.M.ASCE; Yasemin Nielsen, Ph.D.; and Mustafa Ozdemir)
2014	Effectiveness of Coordination Methods in Construction Projects (Andrew S. Chang and Fang-Ying Shen)
2015	Impact of uncertainty factors in construction projects (B. Fahathul Aziz1, D.Senthil Kumar)
2016	(Dr. Ashraf samara et al.)Causes and Effects of Delay in Public Construction Projects in Jordan

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V. RESEARCH METHODOLOGY

The research methodology contains two phases. The first phase included a literature reviews and interviews. The literature review was conducted through books and international management journals. As the outcome of this phase, 18 delay factors causes of delays for construction projects were identified. These causes are :Approval, Materials related, Labours related , Equipment related, Financial issues & Cash flow, Mistakes during construction, Government policies, Client related, Contractor related, Prefeasibility studies, Deviation in drawings/Design related, Weather condition & Environmental factors, accidents, quality control/assurance, economic condition, Agreement issues, Adaption of advanced technology. The second phase includes the ranking of the uncertainty factors which are causes of delays in construction projects. These factors are ranked by Relative Importance Index (RII).

		Frequency of Occurrence (a)					Severity of effect (b)				
S.No.	Types Of Delays	Very Small	Small	Normal	Large	Very Large	Very low	Low	Medium	High	Very High
	Contractor Related Delays	1	2	3	4	5	1	2	3	4	5
1	Poor site management and supervision										
2	Financial difficulties										
3	Unsuitable construction method										
4	Mistakes during construction										
5	Inadequate contractor experience										
6	Defective works										
7	Poor subcontractor performance										
8	Improper planning										
	Client Related Delays										
1	Client interference										
2	Slow decision making										
3	Contract modification										
4	Change order										
5	Financial difficulties of client										
6	Un coorperative client										
7	Slow payment of completed work										
8	Unrealistic contract duration										

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A. Data Analysis

The data analysis will be done by relative importance index technique Relative Importance Index technique: S.M.Renuga and Balasubramanian Malathi[1] used the Relative Importance Index method to determine the relative importance of the various cause of delays. The same method is going to be adopted in this study. The five-point scale ranged from 1(not much) to 5 (very important) will be adopted and will be transformed to relative importance indices (RII) for each factors as follows:

$$RII = \sum W / A*N \quad (1)$$

Where, W is the weighting given to each factor by the respondents (ranging from 1 to 5), A is the highest weight (i.e. 5 in this case), and N is the total number of respondents. The RII value had a range from 0 to 4 (0 not inclusive), higher the value of the RII, more important was the causes of delays. The RII was used to rank the different uncertainty factors that cause delay. These ranking made it possible to cross-compare the relative importance of the uncertainty factors as perceived by the respondents.

B. Questionnaire Survey

Questionnaire were completed at the meeting with the project manager, planning engineer this method had the added benefit of making clarification to respondent about the uncertainty factors and gives chances to surveyor to explore possible uncertainty factors influencing the construction projects. These uncertainty factors in means of importance scale are carried out by relative importance index method (RII).The uncertainty factors are ranked according to the RII values and the top 10 uncertainty factors are identified.

TABLE II

	Consultant Related Delays										
1	Mistakes in design										
2	Changes in drawings/specifications										
3	Incomplete documents/drawing										
4	Defects in design										
5	Inadequate supervision to contractor										
6	Delay of work approval										
7	Late issue of instruction										
8	Slow correction of design problem										
9	Late valuation work										
10	Slow inspection of completed works										

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	Material Related Delays										
1	Shortage of material										
2	Material procurement problem										
3	Material fabrication delay										
4	Unforeseen material damages										
5	Slow delivery of ordered materials										
6	Noncompliance of material to specification										
	Contract-Relationship Related										
1	Conflict between parties										
2	Difficulties of coordination between parties										
3	Lack of communication between parties										
	Plant/Equipment Related										
1	Equipment shortage										
2	Wrong selection										
3	Low efficiency										
4	Equipment delivery problem										
5	Inadequate skill of operators										
6	Equipment breakdown and maintenance problem										

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	Labour Related Delays										
1	Labour disputes/strikes										
2	Weak motivation										
3	Lack of skilled labour										
4	Low productivity										
5	Shortage of manpower										
6	Labour injuries/accident in site										
7	Absenteeism										
	External Factors										
1	Act of God										
2	Inclement weather condition										
3	Price fluctuation										
4	Government regulation										
5	Problem with neighbour										
6	Unforeseen site condition										
7	Civil disturbance										
8	Slow process of Building permit										

VI. CONCLUSIONS

A. The aim of this paper is to identify the delay factors in construction projects because delays are considered to be serious problem in the construction industry.

B. Construction delay is a critical function in construction projects.

C. In general, the amount of time-delay and cost-increase (overrun), increased with an increase in the total cost of a residential project.

D. Cost overrun and time overrun (extension of project duration) were the two most frequent effects of delays which significantly affects the construction projects.

E. There are loss and expense claims arising from delay and fluctuation claims during the delay period which have significant effects on cost overrun.

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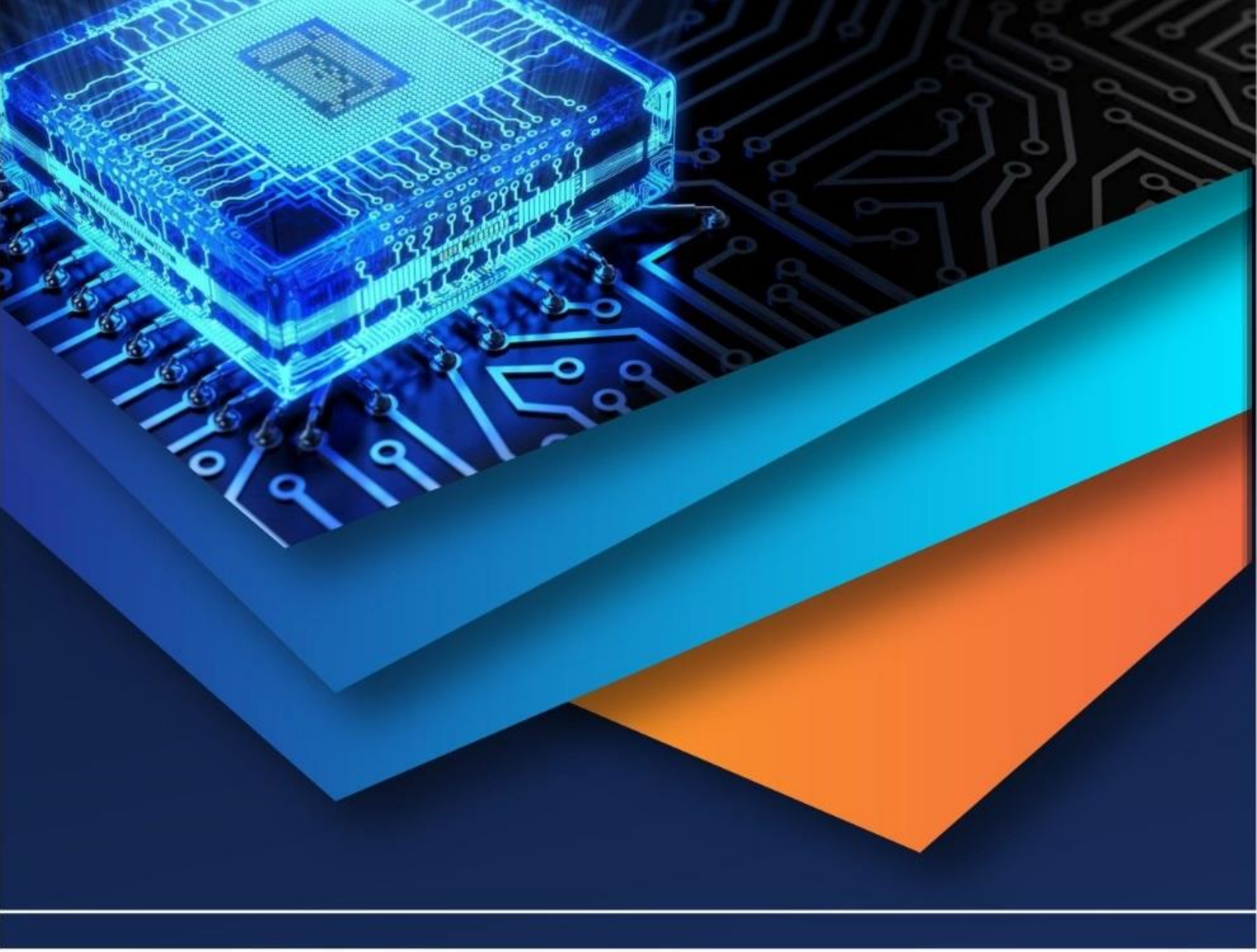

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