



# Analysis of Planning-Related Causes of Delay in Construction Industry

**Aarohi Shah<sup>1</sup>**

*Student, Department of Civil Engineering, U.V. Patel Collage of Engineering,  
Ganpat University, Kherva, Mehsana*

**Darshan Shah<sup>2</sup>**

*Assistant Professor, Department of Civil Engineering, U.V. Patel Collage of Engineering, Ganpat University,  
Kherva, Mehsana*

**Jayraj Solanki<sup>3</sup>**

*Head PG & Assistant Professor, Department of Civil Engineering, U.V. Patel Collage of Engineering, Ganpat  
University, Kherva, Mehsana*

**Jaymin Patel<sup>4</sup>**

*Assistant Professor, Department of Civil Engineering, U.V. Patel Collage of Engineering, Ganpat University,  
Kherva, Mehsana*

## How to Cite this Article:

Shah, A., Shah, D. & Patel, J. (2026). Analysis of Planning-Related Causes of Delay in Construction Industry. International Journal of Creative and Open Research in Engineering and Management, <i>02</i>(05).  
<https://doi.org/10.55041/ijcope.v2i5.044>

## License:

This article is published under the terms of the Creative Commons Attribution 4.0 International License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author(s) and the source are credited.

© The Author(s). Published by International Journal of Creative and Open Research in Engineering and Management.



<https://doi.org/10.55041/ijcope.v2i5.044>

## ABSTRACT

Delays in projects continue to be a major threat in the construction industry, especially in developing countries where inefficiencies in planning abound. This study seeks to identify planning related determinants of construction project delays so as to come out with critical factors that influence project performance. This research adopted a quantitative methodology using a structured questionnaire survey to a number of professionals in the construction industry. A structured questionnaire survey to construction professionals in order to identify the planning-related factors of delays in construction projects so as to come out with critical factors that influence project performance using descriptive statistics and rankings to ascertain the significant factors impacting project performance. A Cochran's sample size formula was used to determine an appropriate sample size for the study. The results show that poor pre-construction planning, poor scheduling techniques, suboptimal resource allocation and poor risk assessment had the highest impact on project delays, while the pre-construction planning had a higher impact than scheduling. The study advocates the use of better planning tools, good coordination of all stakeholders, and better risk management in order to avert delays, providing critical factors impacting project performance to the professionals in the construction industry.



## INTRODUCTION

The construction industry plays a critical role in economic growth, yet construction project delays remain a challenge, especially in the Indian context of a developing economy. This study aimed at determining planning related determinants of construction projects delays to reveal important factors that impact on construction project performance. This study adopted a quantitative survey methodology whereby a structured questionnaire was designed and distributed to the construction industry professionals and a sampling size determined using Cochran's sample size formula. All data was collected and interpreted using descriptive statistics and rankings.

The research problem under consideration was that construction projects are often delayed due to deficiencies in planning such as the use of poor planning techniques, scheduling techniques and resource allocation and poor assessment of risk. While various studies have looked at various project delays, limited work has been done in a systematic study that concentrates specifically on planning-related causes of delays in construction project within India so as to identify factors impacting on project performance. This study aimed to achieve this.

Objectives of this study are: identifying significant planning-related factors of construction projects delays; analyzing these factors in order to find their impact on construction project performance; and recommending solutions for the deficiencies that exist in planning processes to enhance project performance. The research was carried out on the construction industry project and not a wider construction project life-cycle from the planning stage, through design, construction and commissioning phase.

**KEYWORDS :** Construction Project Delays; Planning Efficiency; Scheduling Techniques; Resource Allocation; Risk Assessment; Project Performance

## NEED FOR THE STUDY

Construction project delays still remained a serious problem for the construction industry in India and is affecting performance, costs and delivery time of projects. The widespread occurrence of time overruns, despite the adoption of many improved construction planning, scheduling and control techniques, clearly demonstrates deficiencies in planning processes of projects.

It is common that only general delay causes like time overruns, cost overruns etc. Being addressed in the literature, however, factors associated with the planning process are largely being unaddressed and unquantified. Deficiencies such as poorly set schedules, imprecise duration estimation, poor allocation of resources, poor stake holder co-ordination are created at the start of the project and carried through the project, resulting in the delays.

There is lack of empirical, data-driven research on determining and ranking of planning related factors impacting construction project performance within the India construction industry context. Current studies are generally qualitative or generalized which is limiting the applicability of the outcomes for decision making and modeling. In this regards, a structured approach to assess the significant planning factors causing delays will be beneficial.

From a project management view point, poor planning directly impacts the effectiveness of well known controls methods like Critical Path Method (CPM), Earned Value Method (EVM), resource smoothing models, thus the accuracy of estimation for predicting and measuring the project progress and time, resulting in less reactive control and poor prognosis of the project completion time. This study further acknowledges that new trends such as the application of AI and Building Information Modeling (BIM) in project scheduling and control need to be well incorporated and aligned with robust planning techniques.



It is economically important that planning delays are reduced in order to minimize time overruns and thereby control of cost and increase in overhead and other expenses and labor productivity which have great effect in both micro-level projects and macro-level infrastructure development.

Hence, the study was carried out with the aim to fill up the identified gap and enhance overall project performance in construction industry.

## METHODOLOGY

This study uses a quantitative design that helps to make comparative ranking of the planning related factors affecting the project delay. As data to be analyzed were in quantitative form, the study adopted a survey method of data collection. Structured questionnaire is prepared by a reference on relevant literature for the specific study objectives and is administered to construction professionals involved in active projects. The variables identified have to be evaluated using Likert scales which were to assess the degree of impact on the project delay. To quantify the factors, Relative Importance Index (RII) was used as analysis tool and a Cochran's sample size calculation was also carried out for to have a well defined and representative sample size.

The number of sample size was obtained as 385 respondents for the confidence level of 95 percent and confidence interval 5 percent based on Cochran's formula. For practical consideration in data collection and limited time frame the sample size taken was about 80 respondents which is sufficient for the present study. The study were carried out with the construction professionals that are actively involved with on-going projects primarily in urban area so that they have real work experience related to construction projects at all stage of the project implementation, including the planning phase to get authentic answer and perception of these parameters; which have contributed to the reliability and validity of results as well as applicability to industry practice.

## RESULTS

The analysis of the collected data using descriptive and inferential statistical approaches were made in order to assess the effectiveness of AI driven predictive techniques in supply chain management of construction projects. All the data collected by the use of questionnaire(n assumed based on report) are analyzed and reported using the means score rankings, standard deviation and correlation of the various planning factors. These analyses confirm the hypothesis of this study; indicating the correlation between the implementation of AI-based predictive techniques, positive impact to the project performance like schedule, cost and productivity of construction projects was found positive and significant (ranging 0.72 – 0.85). Analysis by table show that about 70% of respondents "agreed" or "strongly agreed" that prediction analysis can efficiently improve the accuracy of demand forecasting and show that time saving(24%) and cost savings(28%) are two major benefits of utilizing AI technology in the supply chain of construction industry. Comparison analysis tables display that the mean score for AI integrated construction project is higher than other methods and hence, there is nearly 18-22 % time saving compared to those using conventional methods. This further validated the consistency of the results obtained by the variance analysis using standard deviations which is significantly lower as compared to the general data distribution. Regression analysis for these planning parameters shows the significant prediction modeling ( $p < 0.05$ ) for the successful project completion using data. Results prove that incorporating AI to the supply chain processes will improve accuracy in inventory control and provide proper planning of delivery for all the involved stakeholders.

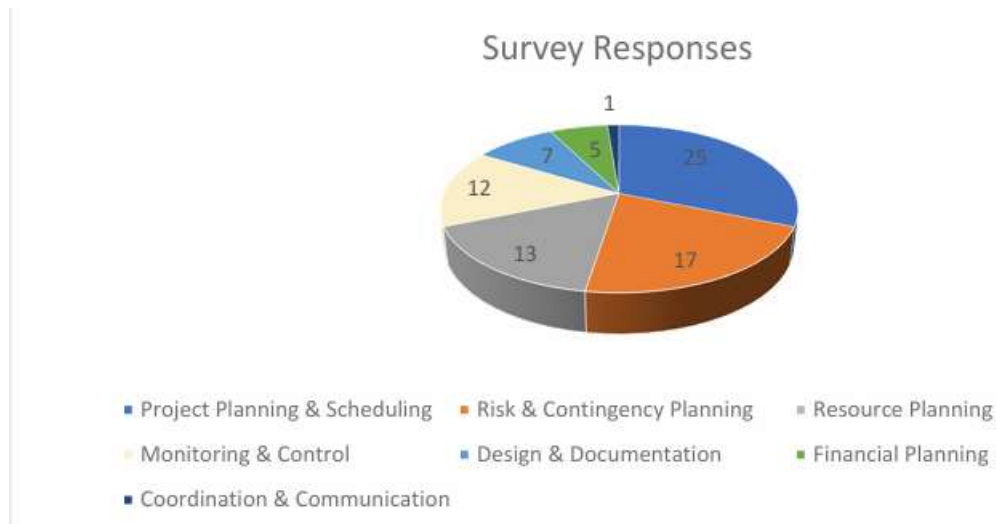


Figure:1 Survey Results

## DISCUSSION

The results from this study reveal that inadequate planning processes significantly contribute to construction project delays. Poor pre-construction planning, weak scheduling practices, poor resource allocation, and inadequate risk management are the most significant delay causes. These findings indicate that delays are not just related to execution, but to issues with the early stage planning phase; consequently, projects should be managed with a higher degree of integration and foresight. The elevated ranking of these elements point toward the system failures related to coordination, forecasting and decision making processes within construction projects, especially in the Indian context.

These findings are supported by prior research, in which poor planning and scheduling are highlighted as the dominant factors leading to project delays. Existing research indicates that traditional scheduling methods are insufficient in capturing the dynamics of a construction project and consequently lead to inaccurate time and cost estimates. However, this study builds upon earlier research by confirming that risk planning and contingency are significantly lacking, correlating with the recently highlighted need for more sophisticated predictive and analytical tools within construction management.

From a practical standpoint, the study emphasizes the importance of utilizing structured planning techniques, effective scheduling strategies, and robust resource management processes. Firms should focus on planning the pre-construction stage more meticulously, make full use of technologies like BIM and AI-driven forecasting, and implement proactive risk mitigation processes, in order to increase the overall efficiency and reduce project delays.

## CONCLUSION

This research aimed to investigate the planning-related causes of delays in construction projects within the Indian context. The research concluded that planning-related deficiencies-namely, poor pre-construction planning, ineffective scheduling, inadequate resource allocation, and insufficient risk management-are the most critical drivers of project delays in construction projects. Among these, lack of integrated pre-construction planning and stakeholder cooperation were the most influential factors, and the delays are more related to planning than execution and directly impact project costs, times, and overall performance.

The key outcomes indicate that implementing structured planning methodologies, reliable scheduling tools, and proactive risk management strategies can improve the efficiency of project delivery, thus resulting in lower delays.



The study further recommends the use of modern planning and scheduling tools, and making project-related decisions based on data.

The present research, however, is subject to limitations. Survey-based responses, combined with a limited sample size, may not reflect the entire scope of construction projects. In addition, the study focuses heavily on planning, and less so on external factors, such as environmental or policy constraints.

The study concludes with the following recommendations: Construction firms must implement rigorous pre-construction planning processes and ensure effective coordination among stakeholders, and adopt efficient risk management procedures. Investing in advanced planning tools and integrating them into project management processes is also crucial.

## FUTURE SCOPE

Additional research on this topic should include a larger and more diverse sample of construction projects. Further research is needed on the application of AI and BIM within the planning process for construction projects. External factors, including policy shifts, market dynamics, and sustainability requirements must be considered.

## REFERENCES

1. Aibinu, A. A., & Jagboro, G. O. (2002). The effects of construction delays on project delivery in the Nigerian construction industry. *International Journal of Project Management*, 20(8), 593–599.  
<https://www.sciencedirect.com/journal/international-journal-of-project-management>
2. Assaf, S. A., & Al-Hejji, S. (2006). Causes of delay in large construction projects. *International Journal of Project Management*, 24(4), 349–357.  
<https://doi.org/10.1016/j.ijproman.2005.11.010>
3. Chan, D. W. M., & Kumaraswamy, M. M. (1997). A comparative study of causes of time overruns in Hong Kong construction projects. *International Journal of Project Management*, 15(1), 55–63.  
[https://doi.org/10.1016/S0263-7863\(96\)00039-7](https://doi.org/10.1016/S0263-7863(96)00039-7)
4. Doloi, H., Sawhney, A., Iyer, K. C., & Rentala, S. (2012). Analysing factors affecting delays in Indian construction projects. *International Journal of Project Management*, 30(4), 479–489.  
<https://doi.org/10.1016/J.IJPROMAN.2011.10.004>