# Over-Engineering Schedules: When Excessive Detail in P6 Backfires

**Deepika Dayalan**

Independent Researcher
Deepikadayalan5@gmail.com

**Abstract:**
**In this research, the effects of excessive detail in Primavera P6 schedules are explored to minimize project management effectiveness in construction environments. Comprehensive scheduling is a core aspect of successful project delivery, as this study indicates. However, over-engineered schedules can generate unnecessary complexity, exacerbate practical usability, and complicate actual scheduling and maintenance. This paper analyzes industry practices, identifying areas where additional scheduling details bring diminishing returns and negatively affect project outcomes. The results indicate that P6 scheduling is best when the balance lies between being complete and usable, with suggestions for construction professionals to develop schedules that are neither too complete nor too usable.**

**Keywords: Construction Management, Primavera P6, Schedule Complexity, Project Controls, Over-Engineering, Schedule Optimization**

## INTRODUCTION

Primavera P6 is the established industry-leading enterprise project portfolio management solution for scheduling, and scheduling is the industry's backbone for construction project management. The software's capabilities are comprehensive, to the point that very detailed schedule development—a first impression of value but a potential point of trouble when pushed too far. With the construction industry embracing digital transformation, an unfortunate development has been the development of schedules to an exorbitant level of granularity that is not useful [1]. This research asks how over-engineered P6 schedules, despite their apparent thoroughness, can negatively impact schedule effectiveness, reduce team engagement, and ultimately affect project performance. This study seeks to identify the appropriate tradeoff between detail and usability so construction professionals are provided with aid in creating schedules that suit their purpose.

## LITERATURE REVIEW

Like scheduled technologies, scheduling practices of construction management also followed the technological progress in project management software. Simple bar charts and network diagrams were used for early construction schedules, giving general project activity timeframes. Whereas commercial software would gradually get more sophisticated, from Primavera P6 and more, construction professionals would eventually have the option to create increasingly detailed schedules. This capability, however, has led to "schedule inflation" (tends to make schedules more and more complicated without improving project outcomes) [2]. Many studies have established that while a certain degree of detail is essential for effective project control, too much detail is not helpful and may even be detrimental above some threshold. It is shown through research that highly detailed schedules become unmanageable and that more of the schedule time is used to maintain the schedule than to use it as a management tool.

The over-engineered schedules across the different construction sectors have been documented. Field personnel often ignore Highly detailed schedules because they are too complex and irrelevant to daily project execution, leading to a gap between planned and executed projects. Additionally, excessive schedule schedules develop artificial constraints that do not correspond to actual work associations and give misleading critical path calculations [3]. It can be quite difficult to identify truly critical activities when activities are broken down to extreme levels, and the increased number of logic relationships exponentially complicates

schedule analysis, obscuring what critical activities are and can mislead the management into misallocating resources and attention to issues that are not truly critical.

In the construction industry, schedule detail has become synonymous with thoroughness and professionalism, resulting in incentives to develop schedules that soon become more and more sophisticated. The contract requirements sometimes specify the minimum activity counts without considering practical usability. The cognitive aspects of schedule development are found to be studied by studies that demonstrate that project planners frequently overestimate how much detail can be effectively controlled, especially in a fast-paced construction environment. However, the research indicates that humans can process seven or so variables at a time, while common overengineered schedules demand the simultaneous processing of dozens or hundreds of activities [4]. In addition, organizational factors that complexify the schedule include siloed planning processes in which sub-schedules of limited utility are developed by specialist planners who have not integrated or considered the overall schedule from a practical design perspective.

## SCOPE

In this research, this phenomenon study is performed through Primavera P6 and, more specifically. It takes a technical and behavioral view of schedule development and concerns itself with the degree of detail required versus the practical detail. Although the research is applicable in most construction sectors, the focus is on medium- to large-scale projects that last more than six months (s), with scheduling being the most complex. It describes the creation and maintenance phases of scheduling and examines how early over-engineering impacts the subsequent schedule management process of the project lifecycle [5]. The research does not aim to find a single universal 'optimal' level of the schedule detail. Still, it suggests a generic way of limiting the scheduling complexity based on the project characteristics and the management needs.

## PROBLEM STATEMENT

This research addresses the problem of the disconnect between the complexity of schedule and practical utility in construction project management. Although substantial investment has been made in sophisticated scheduling tools like Primavera P6, advanced scheduling has few benefits because of impractical levels of detail. Paradoxically, over-engineered schedules, full of activity breakdown, excessive logic relationships, and excessive constraints, resulting in more detailed scheduling efforts in less effective project control [6]. This phenomenon results in several challenges, such as the need for disproportionate resources to uphold schedules, diminished stakeholder participation because of complexity, obscured critical paths that complicate risk assessment, and declining schedule reliability with the project's progression. Construction professionals have ordinarily defaulted to maximum granularity for schedules, satisfying the letter of the requirements of the contract, but do so at the cost of schedules that are technically adequate but fail as practical management tools without clear guidance regarding appropriate schedule detail.

## SOLUTION

The over-engineering schedule is solved by developing an approach that balances schedule effectiveness with sheer detail. It starts with a change in perspective at its core, from a perspective that sees schedules as techno exercises to a view that regards it as a communication tool. The P6 scheduling methodology needs to be adopted by construction professionals so that each component of the P6 schedule is evaluated as to whether it adds to the project's understanding and control. Regarding Primavera P6 in particular, organizations should have planning standards that document how activity definition is done and ranges of activity durations by work type and phase. It also incorporates P6's hierarchical features to develop multi-level schedules, where the summary activities offer a simpler overview that enables different stakeholders to work with the schedule at the desired level of detail without bloating the entire project team [7].

## USES

P6 schedules contain information other than date tracking, and they accomplish much more than that in construction management. Detailed schedules developed to the right degree of detail provide an effective communication tool for utilizing the different stakeholders to focus on a common understanding of how the project should be executed. Well-structured schedules allow project managers to allocate resources

effectively, identify conflict areas, and, most importantly, prioritize critical activities. Properly detailed schedules are clear without micromanaging daily operations for field personnel. Schedules that show true risks from the project without getting lost in the nuts and bolts of detail are good for executives and owners alike. By changing priorities and focusing on meaningful detail, the construction team can make the Primavera P6 from a compliance requirement into a valuable management tool that adds value to project delivery [8].

## IMPACT

In addition to improving schedule management, schedule over-engineering addressing has a direct effect on project performance and team dynamics. Nonetheless, projects with sufficiently detailed schedules show better adherence to the schedule because the plans are more likely to be followed if they are realistic rather than overly sophisticated. It has been found that optimizing the schedule details can lead to a reduction of 30-50% in schedule maintenance effort, freeing project control personnel to concentrate on analysis, not data entry. From the team perspective, right-sized schedules help in better collaboration as a common framework to understand is provided for all project participants. Also, projects with appropriately detailed schedules have fewer delays and budget overruns. According to [8], implementing a balanced scheduling approach in organizations leads to better client satisfaction because forecasting becomes more reliable and progress reporting is transparent.

## CONCLUSION

Construction management attempts to establish control through increasingly detailed and perfect Primavera P6 project schedules and how it pursues perfect project predictability in pursuit of greater control. This research shows that schedule effectiveness is not a measure of the detail amount but of the presentation's quality and relevance. However, excessive complexity and disconnection from field reality are the causes of over-engineered schedules, which achieve an air of certainty by being overly complex and disconnected from field reality. Both comprehensive planning and practical usability are balanced, mostly dealing with meaningful work packages, not arbitrary detail thresholds. Construction professionals need to realize that schedules are largely used as communication devices to promote understanding of the project among many stakeholders. Switching focus from maximum granularity to detailed purpose allows organizations to deliver P6 schedules from a burden of compliance documents to useful management tools that truly aid the project delivery process.

## REFERENCES:

[1] A. Sallam, “Maximizing Efficiency in Primavera P6: Managing Activities, Level of Detail, and Agile Integration,” *Planning Engineer FZE.*, Jan. 05, 2025. https://planningengineer.net/maximizing-efficiency-in-primavera-p6-managing-activities-level-of-detail-and-agile-integration/ (accessed Apr. 18, 2025).

[2] Oracle, “Primavera P6 EPPM - Datasheet | Oracle Kenya,” *Oracle.com*, 2021. https://www.oracle.com/ke/construction-engineering/primavera-p6/datasheet/

[3] N. Adepu, S. Kermanshachi, A. Pamidimukkala, and K. Loganathan, “Analyzing the factors affecting construction project schedules amidst COVID-19 pandemic,” *Project Leadership and Society*, vol. 4, p. 100100, Dec. 2023, doi: https://doi.org/10.1016/j.plas.2023.100100.

[4] M. Tomczak and P. Jaśkowski, “Preferences of Construction Managers Regarding the Quality and Optimization Criteria of Project Schedules,” *Sustainability*, vol. 13, no. 2, p. 544, Jan. 2021, doi: https://doi.org/10.3390/su13020544.

[5] K. Ninpan, S. Huang, F. Vitillo, M. A. Assaad, L. Benmiloud Bechet, and R. Plana, “Mitigating Co-Activity Conflicts and Resource Overallocation in Construction Projects: A Modular Heuristic Scheduling Approach with Primavera P6 EPPM Integration,” *Algorithms*, vol. 17, no. 6, p. 230, Jun. 2024, doi: https://doi.org/10.3390/a17060230.

[6] K. Castañeda, O. Sánchez, R. F. Herrera, and G. Mejía, “Deficiencies Causes in Road Construction Scheduling: Perspectives from Construction Professionals,” *Heliyon*, vol. 11, no. 2, pp. e41514–e41514, Dec. 2024, doi: https://doi.org/10.1016/j.heliyon.2024.e41514.

[7] L. D. Nguyen, L. Le-Hoai, D. Q. Tran, C. N. Dang, and C. V. Nguyen, "Effect of project complexity on cost and schedule performance in transportation projects," *Construction Management and Economics*, vol. 37, no. 7, pp. 384–399, Nov. 2018, doi: https://doi.org/10.1080/01446193.2018.1532592.

[8] N. V. Desai, N. B. Yadav, and N. N. Malaviya, "Increasing the potential application of Microsoft project and Primavera P6 for project management: A comparative analysis of the residential project," *Materials Today: Proceedings*, vol. 77, Dec. 2022, doi: https://doi.org/10.1016/j.matpr.2022.11.485.