

The Role of Progressive Baseline Planning in Enhancing Agile Project Effectiveness (A Comparative Case Study of Two Projects in an IT Consulting Environment)

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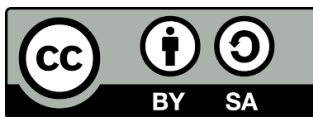
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ABSTRACT

Agile methodology is widely adopted in software development due to its adaptability to evolving requirements. However, within IT consulting organizations that manage projects with fixed deadlines, high task dependencies, and concurrent multi-project execution, Agile implementation often faces challenges related to project planning, scheduling, and control. This study aimed to analyze the role of progressive baseline planning, a staged planning approach that applies layered baselines and detailed timeline decomposition, in improving the effectiveness and efficiency of Agile project execution. This research employed a qualitative approach using a comparative case study design involving two software development projects within the same IT consulting organization: the NOI External Project and the Document Generator Project. Although both projects demonstrated comparable levels of complexity and development duration, they showed significant differences in execution performance. Data were collected through project document analysis and semi-structured interviews with project team members. The findings indicate that the implementation of progressive baseline planning in the NOI External Project enabled more detailed task decomposition, identification of parallelizable activities, and data-driven project monitoring through planned-versus-actual performance comparisons. The project was completed 12.5% faster than the initial estimate (14 weeks compared with 16 weeks). In contrast, the Document Generator Project experienced a 60% schedule delay (16 weeks compared with the planned 10 weeks) due to the absence of a structured baseline planning approach. These findings suggest that progressive baseline planning can strengthen Agile project control by improving schedule visibility, resource coordination, and execution predictability in complex IT consulting environments.



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INTRODUCTION

Agile methodology has become a widely adopted approach in software development because it emphasizes iterative delivery, team collaboration, and adaptability to changing requirements. However, previous studies indicate that the success of Agile implementation is not universal and is strongly influenced by organizational contexts and project characteristics. In IT consulting environments, projects are commonly executed under contractual agreements with fixed deadlines, multiple stakeholders, and concurrent execution by shared project teams (Bygballe et al., 2016; Eriksson, 2016; Gupta & Jha, 2023; Ismail & Salama, 2025; Lech, 2016).

Within this context, Agile practices implemented with limited formal planning may create several challenges. These challenges include difficulties in managing task dependencies, limited schedule visibility, and reduced ability to evaluate alignment between planned activities and actual project progress. This condition highlights the need for a planning approach that maintains Agile flexibility while providing sufficient structure to support effective project control (Ahimbisibwe et al., 2015; Alamri et al., 2024; Butler et al., 2020; Rana, 2025; Tettey et al., 2025).

This need is reflected in the outcomes of two projects with relatively similar characteristics but significantly different schedule performance. The Document Generator Project was planned with an estimated duration of 10 weeks but required 16 weeks for completion, resulting in an approximately 60% schedule delay from the initial plan with a total effort consumption of 421 person-days. In contrast, the External NOI Project was planned for 16 weeks and was completed in 14 weeks, approximately 12.5% faster than the initial estimate, despite requiring a slightly higher total effort of 442 person-days. The difference in schedule outcomes and effort utilization indicates an execution effectiveness gap that cannot be explained solely by project effort or complexity (Cicmil et al., 2017; Coombs, 2015; Iyer & Banerjee, 2016; Si et al., 2026; Zhu & Mostafavi, 2017).

The tension between flexibility and control is particularly evident in IT consulting organizations. Unlike internal software development initiatives, consulting projects are typically executed under formal agreements that define delivery schedules, scope requirements, resource commitments, and budget constraints. Consulting teams may also manage multiple projects simultaneously, share specialized personnel, and coordinate with various client and internal stakeholders. Under these conditions, a general product backlog or high-level operational timeline may be insufficient to identify dependencies, allocate resources effectively, and determine activities suitable for parallel execution. When planning artifacts are not progressively refined based on emerging project information, teams may respond reactively to issues, resulting in idle time, bottlenecks, undocumented changes, and schedule deviations detected only after they affect overall project performance.

Previous research has demonstrated the potential benefits of Agile while emphasizing that its effectiveness depends on contextual factors. Conforto et al. (2016) showed that Agile project management practices can be applied beyond software development when organizational and project conditions support iterative planning and collaboration. Serrador and Pinto (2015) identified a positive relationship between Agile adoption and project success, although the strength of this relationship varied across project contexts. Similarly, Krancher et al. (2020) reported that Agile practices can support outsourced software development projects in managing changing requirements, but successful implementation depends on effective coordination and knowledge integration. These findings indicate that Agile practices create value when supported by complementary managerial capabilities rather than being implemented as an isolated approach.

Recent research has further explored the organizational and human factors affecting Agile effectiveness. Based on 177 valid survey responses, Barros et al. (2024) found that team capability and customer involvement were among the strongest human-related predictors of Agile software development project success, alongside psychological safety and team autonomy. Dong et al. (2024), through a systematic literature review, conceptualized Agile

project management as a flexible approach that integrates project goal discovery and iterative delivery within a supportive organizational environment. Meanwhile, Paasivaara et al. (2012) demonstrated that inter-team coordination becomes essential when Agile development involves multiple teams and distributed work arrangements. Collectively, these studies show that autonomy and flexibility require supporting coordination mechanisms, shared information, and clear decision-making structures (Borghoff et al., 2025; Tran et al., 2025).

Project management literature has also emphasized the importance of baselines and structured work decomposition. A project baseline provides an approved reference for evaluating actual schedule, cost, and work performance, while a Work Breakdown Structure (WBS) converts project deliverables into manageable activities. Earned value management similarly integrates planned scope, schedule, and resources to identify deviations and support corrective actions (Project Management Institute, 2011; Fleming & Koppelman, 2016). However, a fixed baseline established only at project initiation may not adequately accommodate progressive requirement clarification in Agile environments. Progressive baseline planning addresses this limitation by developing and refining baselines incrementally as additional project information becomes available (Del Fiore et al., 2025; Karimi et al., 2025; Yang et al., 2026).

Although previous studies have examined Agile success factors, team coordination, organizational readiness, and performance measurement, limited attention has been given to progressive baseline planning as a mechanism for balancing Agile adaptability and managerial control. Existing research generally discusses Agile planning through sprint planning, backlog refinement, release planning, or hybrid project management approaches at a broad level. Limited empirical evidence explains how layered baselines, activity-level timeline decomposition, dependency mapping, and planned-versus-actual comparisons function together throughout project planning, execution, and control stages. Furthermore, studies rarely compare two relatively similar Agile projects within the same organization, despite the potential value of such comparisons in reducing the influence of organizational culture, governance structures, and operational procedures.

This research gap is evident in the two IT consulting projects examined in this study. The Document Generator Project was initially planned for 10 weeks but required 16 weeks for completion, representing an approximately 60% schedule delay, with a total effort consumption of 421 person-days. Conversely, the External NOI Project was scheduled for 16 weeks and completed in 14 weeks, approximately 12.5% faster than planned, despite requiring slightly greater effort of 442 person-days. Because both projects were conducted within the same organizational and governance environment and had comparable development characteristics, their contrasting outcomes cannot be adequately explained by organizational differences or total effort alone. The variation directs attention toward differences in planning depth, task decomposition, dependency identification, and baseline-based monitoring practices.

Investigating this issue is important because schedule deviations in consulting projects can affect labor costs, team capacity, client satisfaction, contractual obligations, and the organization's ability to undertake subsequent projects. A project with substantial effort expenditure but insufficient planning structure may appear active while concealing delays, resource conflicts, and unresolved dependencies. Progressive baseline planning may mitigate

these risks by allowing plans to evolve while maintaining reference points for performance evaluation. Examining this mechanism may clarify whether staged baselines and activity-level timelines support earlier deviation detection, systematic parallelization, reduced idle time, improved communication, and better alignment among project duration, effort, and resource availability.

Accordingly, this study aimed to examine the role of progressive baseline planning in enhancing Agile project execution effectiveness through a qualitative comparative case study of the External NOI Project and the Document Generator Project. The novelty of this study lies in analyzing progressive baseline planning as an integrated mechanism consisting of staged baseline development, detailed timeline decomposition, Work Breakdown Structure formulation, dependency mapping, and planned-versus-actual monitoring within a single IT consulting environment. This study sought to identify differences in planning artifacts and execution practices, explain their implications for schedule control, and evaluate how progressive baseline planning supports the balance between adaptability and predictability. Theoretically, this study extends discussions of Agile effectiveness by positioning planning structure as an enabling mechanism that supports rather than constrains agility. Practically, the findings provide project managers and IT consulting organizations with insights for designing adaptive yet measurable planning systems that improve schedule visibility, resource coordination, deviation detection, and overall project effectiveness.

METHOD

Research Design

This study uses a qualitative approach with a comparative case study design to analyze differences in planning practices and their implications for project effectiveness.

Research Object

The research object consists of two software projects within the same IT consulting organization:

- External NOI Project
- Document Generator Project

Both projects have relatively comparable levels of complexity and development duration and were carried out within the same organizational and governance environment. This condition allows for a fairer comparison of project management practices, particularly in the planning aspect, without being influenced by significant differences in organizational context.

Data Collection Techniques

Data were collected through:

- a. **Project document analysis**, including baselines, *timeline breakdowns*, and operational timelines.
- b. **Semi-structured interviews** with project managers and development team members.

Data Analysis Techniques

Data analysis was carried out by reviewing and comparing project documents and interview results to identify differences in planning practices, task breakdown, resource allocation, and project control mechanisms. Aspects and indicators were derived through three stages, namely:

1. Identifying project management stages based on standard literature
2. Reviewing Agile issues and challenges commonly reported in prior research
3. Mapping relevant indicators that can be empirically observed through project documents and actual practices in IT consulting environments.

The analysis results were then compared across cases to identify patterns of difference and their implications for project execution effectiveness.

RESULTS AND DISCUSSION

Project Planning Stage

Comparison of Project Planning Artifacts

Table 1 presents a comparison of the planning artifacts used in both projects. This comparison aims to show the differences in the level of planning structure applied before the implementation phase began.

Table 1. Comparison of Project Planning Artifacts

Planning Aspect	External NOI Project	Document Generator Project
Project objective document (FSD)	Available	Available
Initial baseline	Available	Available
Advanced baseline	Available	Not available
Timeline breakdown	Available	Not available
Task breakdown (WBS)	Detailed to activity level	Not performed
Dependency mapping	Available implicitly within the timeline	Not available
Operational timeline	Used as actual	Used as the main plan

Table 1 shows the differences in the planning artifact structure used in both projects before the implementation phase began. Although both projects were equivalent in terms of initial goal-setting and the availability of an initial baseline, there were significant differences in the depth and continuity of the planning applied.

In the External NOI Project, planning was arranged in stages through the presence of an advanced baseline and a *timeline breakdown* down to the activity level. Task breakdown was carried out in detail using a Work Breakdown Structure (WBS), allowing dependencies between activities to be mapped from the planning stage. In addition, the operational timeline in this project was used as an actual reference during execution, not merely as an initial plan. This planning structure provided better visibility into the scope of work and the relationships between activities from the outset of the project.

In contrast, the Document Generator Project relied solely on a single operational timeline as its main plan, without support from an advanced baseline or detailed task breakdown. The absence of a *timeline breakdown* and dependency mapping made the planning more general and provided less operational guidance at the activity level. The operational timeline in this

project functioned more as an initial estimate that did not evolve alongside the dynamics of project execution.

This difference in planning artifact structure became an important foundation influencing project execution effectiveness in the subsequent stage. Staged planning in the External NOI Project enabled more systematic dependency management and schedule control, while minimal planning in the Document Generator Project potentially increased the risk of losing control during implementation. These findings indicate that the presence of *progressive baseline planning* serves as an early mechanism that supports Agile project effectiveness, particularly in the context of IT consulting, which demands predictability and cross-activity coordination.

Scheduling and Work Breakdown

To clarify the implications of planning structure on work execution, Table 2 compares the scheduling and work breakdown characteristics of both projects.

Table 2. Scheduling and Work Breakdown Structure

Indicator	External NOI Project	Document Generator Project
Scheduling model	Staged (baseline → breakdown)	Single (global timeline)
Task structure	Hierarchical (WBS)	Flat (flat task list)
Identification of independent tasks	Can be identified from the outset	Identified from the outset, but generally
Potential for parallel work	Planned from the planning phase and highly structured	Planned, but less structured

Table 2 shows a fundamental difference in the scheduling and work breakdown approach of both projects. In the External NOI Project, scheduling was arranged in stages through a baseline developed into a *timeline breakdown* down to the activity level. Work breakdown was carried out hierarchically using a Work Breakdown Structure (WBS), allowing independent activities to be identified from the planning stage.

This work breakdown structure enabled parallel work planning to be carried out more systematically. Activities without direct dependencies could be scheduled to be carried out simultaneously by different teams, allowing the potential for time optimization to be utilized from the beginning of the project. Thus, parallel work in the External NOI Project was not only planned but also supported by a clear and measurable scheduling structure.

In contrast, the Document Generator Project used a single scheduling model in the form of a *global timeline* without detailed work breakdown. The flat task structure caused the identification of independent activities to be carried out generally and not explicitly documented. Although there were efforts to carry out work in parallel, the absence of a WBS and *timeline breakdown* made parallel work planning less structured and highly dependent on ad hoc coordination among team members.

This difference in approach affected the effectiveness of work execution. In the Document Generator Project, the limited work breakdown structure increased the risk of unidentified interdependencies from the outset, causing several activities to have to wait for the completion of other activities. This condition had the potential to create bottlenecks during

project execution and reduce the effectiveness of time utilization, as reflected in the overall delay in project completion.

These findings confirm that detailed and structured work breakdown through *progressive baseline planning* plays an important role in supporting effective scheduling and the execution of parallel work in Agile projects, particularly in IT consulting environments that involve many activities and limited resources.

Agile Implementation Strategy

Although both projects adopted the Agile methodology, their implementation strategies show differences in the level of structure, as summarized in Table 3.

Table 3. Comparison of Agile Implementation Strategies

Aspect	External NOI Project	Document Generator Project
Agile approach	Defined Agile	Flexible Agile
Planning artifact	Staged baseline + breakdown	Operational timeline
Change management	Based on baseline impact	Reactive when it occurs
Change documentation	Recorded	Limited
Basis for decision-making	Structured plan	Operational discussion

Although both projects adopted the Agile methodology, the implementation strategies applied show differences in the level of structure and control mechanisms, as summarized in Table 3. This difference not only reflects variations in operational approach but also has direct implications for the project's ability to manage change and maintain execution effectiveness.

In the External NOI Project, Agile implementation was carried out within a clearly defined planning framework through a staged baseline and *timeline breakdown*. Agile flexibility was maintained, but every change was evaluated based on its impact on the established baseline. This approach allowed the project team to respond to changes in a controlled manner, since decisions made continued to refer to the documented planning structure.

In contrast, the Document Generator Project implemented Agile with a more operationally flexible approach, but was less supported by a structured planning artifact. The operational timeline was used as the main reference without an advanced baseline, causing change management to tend to be reactive when changes occurred. Limited documentation of changes and decision-making that relied more on operational discussion caused the evaluation of the impact of changes on the overall project to be less systematic.

This difference in implementation strategy shows that Agile flexibility does not automatically produce project effectiveness if it is not supported by an adequate planning structure. Agile implementation in the External NOI Project shows that *progressive baseline planning* serves as a control mechanism that allows Agile to be run adaptively while remaining measurable. These findings reinforce the argument that a staged planning structure is an important factor in maintaining the balance between flexibility and control in Agile projects within an IT consulting environment.

Planning Implications for Project Effectiveness

To link planning practices with project effectiveness, Table 4 presents the direct implications of planning structure on project management capability.

Table 4. Implications of Planning Structure for Project Effectiveness

Effectiveness Aspect	External NOI Project	Document Generator Project
Schedule deviation detection	Achievable	Not achievable
Dependency management	Proactive	Reactive
Time optimization	Possible through parallelization	Limited
Project predictability	More measurable	Less measurable

Table 4 summarizes the direct implications of the differences in planning structure. The comparison results show that staged planning in the External NOI Project made an important contribution to project execution effectiveness from the early stages. The application of a staged baseline and dependency mapping enabled earlier detection of potential schedule deviations and supported structured parallel work planning.

In addition, the detailing of the Work Breakdown Structure (WBS) and the application of staged rebaselining increased visibility into effort and budget implications from the planning stage onward. In the External NOI Project, the project's estimated duration of 16 weeks could be aligned with an estimated effort of 442 mandays, allowing project capacity and workload to be evaluated more realistically from the outset. In contrast, in the Document Generator Project, the initial duration estimate of 10 weeks was not supported by work breakdown and further rebaselining, which ultimately resulted in a duration deviation of up to 16 weeks with a total effort usage of 421 mandays. This difference shows that a detailed planning structure allows potential effort and budget deviations to be identified and anticipated earlier.

The limited planning structure in the Document Generator Project caused project control to be more reactive, both in detecting schedule deviations and in anticipating the implications of changes on effort and budget. These findings indicate that *progressive baseline planning* plays an important role in improving the predictability and effectiveness of Agile projects in IT consulting environments.

Summary and Analysis of Planning Stage Findings

Overall, the findings at the planning stage show that the difference in project execution effectiveness was not caused by differences in project objectives or the Agile methodology used, but by the depth and structure of the planning applied. Both projects adopted similar Agile principles but produced different outcomes due to variations in the management of planning artifacts.

The application of *progressive baseline planning* in the External NOI Project functioned as an *enabler* for more detailed work breakdown, early dependency identification, and structured parallel work planning. This staged planning structure also allowed project control to be carried out on a data-driven basis through comparisons between plans and realization at each stage.

In contrast, the limited planning structure in the Document Generator Project restricted the project's ability to manage dependencies and carry out proactive control. This condition resulted in low predictability of project execution and limited time optimization during the execution phase. Thus, the findings at the planning stage indicate that *progressive baseline planning* plays an important role in improving the effectiveness and efficiency of Agile project execution, particularly in IT consulting environments that demand high coordination and control.

Project Implementation Stage

Execution Pattern and Parallel Work

The implementation stage shows how the planning structure established in the previous phase was translated into actual development activities. Although both projects applied a parallel work execution pattern (*multi-stream*), the difference in planning structure had a direct impact on the effectiveness of that work execution.

Table 5. Comparison of Project Implementation Patterns

Implementation Aspect	External NOI Project	Document Generator Project
Work execution pattern	Parallel (multi-stream)	Parallel (multi-stream)
Basis for work division	Timeline breakdown	Operational timeline
Dependency management	Identified from the outset	Identified from the outset
Work sequence	Flexible but planned	Sequential
Team idle time potential	Low	Relatively high

Based on Table 5, the External NOI Project was able to carry out several development activities simultaneously with a more structured level of coordination. The use of the *timeline breakdown* as the basis for dividing work allowed independent activities to be clearly identified from the outset. This provided flexibility in sequencing work without disregarding dependencies between activities, allowing parallel work to be carried out in a planned and controlled manner.

In contrast, in the Document Generator Project, although parallel work was also conceptually applied, the division of work was based on a more general *operational timeline*. The absence of work breakdown down to the activity level made dependency management less explicit. As a result, the order of work tended to be more linear, as several activities had to wait for the completion of other activities whose dependencies had not been identified in detail from the planning stage.

This difference in approach affected team time utilization during the implementation phase. In the External NOI Project, the planned execution structure enabled the minimization of *idle time* for the team, since activities could be allocated dynamically according to resource availability and dependency status. In contrast, in the Document Generator Project, the limited planning structure increased the potential for *idle time*, particularly when the team had to wait for the completion of other activities before continuing with subsequent work.

These findings show that parallel work in Agile projects is not determined solely by implementation decisions but is strongly influenced by the quality of the underlying planning

structure. *Progressive baseline planning* plays an important role in ensuring that parallel work can be carried out effectively, not merely simultaneously in name only, thereby supporting increased project execution effectiveness at the implementation stage.

Alignment of Plans and Realization (*Planned vs Actual*)

The ability to compare plans and realization is an important indicator for assessing project implementation effectiveness.

Table 6. Alignment of Implementation Plans and Realization

Indicator	External NOI Project	Document Generator Project
Comparative baseline	Available	Not available
Schedule deviation evaluation	Achievable	Not achievable
Basis for progress evaluation	Baseline vs. actual	Operational status
Monitoring accuracy	High	Limited

The ability to compare plans and realization is an important indicator for assessing project implementation effectiveness. This comparison allows progress monitoring to be carried out objectively and supports the early detection of deviations from the implementation stage onward.

The External NOI Project had a comparative baseline that enabled continuous evaluation of the alignment between plans and realization. Progress monitoring was carried out by comparing actual achievements against the established baseline, allowing implementation deviations to be identified early and measurably.

In contrast, the Document Generator Project had no comparative baseline, so progress monitoring was more operational and descriptive in nature. The absence of a quantitative reference limited the project's ability to systematically evaluate the alignment between plans and realization, and reduced the accuracy of deviation detection during implementation.

These findings show that the presence of a comparative baseline through *progressive baseline planning* plays an important role in supporting more effective implementation monitoring and forms the basis for project control at the subsequent stage.

Team Collaboration and Implementation Communication

Besides technical aspects, implementation effectiveness is also influenced by team communication and collaboration patterns.

Table 7. Communication Patterns at the Implementation Stage

Communication Aspect	External NOI Project	Document Generator Project
Decision documentation	Recorded	Limited
Progress transparency	High	Dependent on verbal communication

Based on Table 7, the External NOI Project implemented well-documented communication, allowing progress transparency to be maintained continuously. Documentation of decisions and progress updates enabled all stakeholders to have an aligned

understanding of the project's condition, and provided an information trail that could be used as a basis for evaluation.

In contrast, in the Document Generator Project, communication during implementation relied more on verbal communication and informal coordination. Although this approach provided operational flexibility, limited documentation caused progress transparency to be less consistent and made data-based evaluation more difficult.

These findings show that a documented communication structure supports Agile project implementation effectiveness, particularly in the context of IT consulting projects involving many activities and stakeholders. Communication patterns integrated with the planning structure become an important supporting factor for project control at the subsequent stage.

Project Control Stage Monitoring and Deviation Detection

The control stage aims to ensure that the project runs according to the established plan and to identify deviations early on.

Table 8. Comparison of Monitoring and Control Practices

Control Aspect	External NOI Project	Document Generator Project
Monitoring mechanism	Data-based	Operational
Basis for corrective action	Deviation analysis	Situational discussion
Change tracking	Documented	Inconsistent
Control consistency	High	Moderate

Project control aims to ensure that execution remains aligned with the plan and to support early deviation detection. Control effectiveness is determined by the monitoring mechanism applied throughout the project.

The External NOI Project implemented data-based monitoring with deviation analysis as the basis for corrective action, supported by consistent documentation of changes. In contrast, the Document Generator Project relied on operational monitoring without systematic deviation documentation, causing control to tend to be reactive.

These findings show that the presence of a comparative baseline and documentation of changes through *progressive baseline planning* is an important prerequisite for effective Agile project control.

Analysis of the Implementation and Control Stages

Overall, the findings at the implementation and control stages reinforce the results of the analysis at the planning phase. The staged planning structure in the External NOI Project not only influenced the pattern of work execution but also provided a basis for more systematic project monitoring and control during execution.

In contrast, the limited planning structure in the Document Generator Project resulted in low progress visibility and a limited ability to objectively evaluate deviations. These findings show that the quality of the planning structure plays an important role in bridging the effective implementation and control of Agile projects.

CONCLUSION

This study demonstrated that the application of progressive baseline planning was associated with differences in the effectiveness of Agile project execution within an IT consulting environment. The contrasting outcomes between the External NOI Project and the Document Generator Project were associated primarily with differences in planning structure and level of detail from the early stages of project execution rather than differences in project objectives or the Agile methodology itself.

In the External NOI Project, staged baseline development and detailed timeline decomposition enabled work to be decomposed to the activity level, allowing schedule planning and effort estimation (442 person-days over a planned duration of 16 weeks) to be more systematically aligned from the outset. In contrast, the less structured planning approach applied to the Document Generator Project resulted in limited visibility into effort requirements and budget implications. This condition was reflected in a substantial schedule deviation, with the project requiring 16 weeks for completion compared with the planned duration of 10 weeks, while consuming a total effort of 421 person-days.

Overall, this study concluded that progressive baseline planning may serve as a mechanism for balancing Agile flexibility with the need for managerial control. This approach can improve schedule predictability and enhance visibility into effort and budget estimates by providing progressively refined planning references throughout project execution. These findings support the application of progressive baseline planning in complex Agile projects within IT consulting organizations, particularly those involving tight deadlines, interdependent activities, shared resources, and demanding project control requirements.

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