COVER PAGE AND DECLARATION

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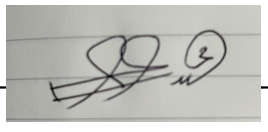
E-SIGNATURE: Mohammad Sadek 

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Research Title

Enhancing Organizational Success in the Process Automation Field through Agile Project Management

Dedication

I dedicate this research to my beloved family, including my wife and my son Faisal, whose unwavering patience and support have been my pillars throughout the past two years during my study period. Additionally, I extend this dedication to all individuals passionate about this field, with the hope that this research will fulfill its intended objectives and contribute meaningfully to the body of knowledge.

Acknowledgment

I would like to express my deepest gratitude to several individuals who have contributed to the completion of this research.

First and foremost, I am immensely thankful to my family for their unwavering support, encouragement, and understanding throughout this journey. Their patience, love, and belief in me have been invaluable, and I am forever grateful for their constant presence in my life.

I am also indebted to my colleagues at work for their collaboration, guidance, and insightful discussions, which have enriched my understanding of the subject matter and significantly contributed to the quality of this report. Their expertise and camaraderie have been instrumental in overcoming challenges and achieving milestones.

Furthermore, I extend my sincere appreciation to my professors, advisors, and mentors for their guidance, feedback, and encouragement at every stage of this endeavor. Their expertise, wisdom, and encouragement have been instrumental in shaping my research and refining my analytical skills.

I am also thankful to all the participants who generously shared their time and insights, enabling me to gather valuable data and perspectives for this study.

Abstract

The complexities and volatility inherent in process automation projects call for a more adaptable framework than traditional project management methods typically employed in the sector. This study delves into integrating Agile Project Management practices into existing frameworks within the industrial process automation sector to form a Hybrid Project Management approach. It aims to gauge project managers' understanding of this hybrid framework's potential value and its benefits for their organizations.

The research employs an explanatory sequential mixed-methods approach, starting with a quantitative survey of 26 project management professionals to assess Agile best practices and project delays in process automation projects. This quantitative phase is followed by qualitative, in-depth interviews with five consultants experienced in both Traditional and Agile Project Management.

The study identifies six key best practices to mitigate project delays and handle project complexity: Iteration Planning, Retrospective Meetings, Daily Stand-Up Meetings, Communication and Collaboration, Enhancing Team Skills, and Solving Contractual Issues. Project delays are attributed to contractual challenges, communication breakdowns, inadequate planning, coordination issues, and a rigid traditional approach. The findings suggest that implementing these best practices can alleviate delays by addressing their root causes.

As an outcome, the study proposes a hybrid framework that integrates Agile best practices into phase-gate project management. This framework combines the clarity and structure of the waterfall methodology with the flexibility, efficiency, and adaptability of Agile Project Management. It is recommended for adoption in the industrial process automation sector. However, potential challenges in implementing the hybrid framework, such as the lack of experience and expertise among project managers, are identified. Recommendations are provided to overcome these challenges and ensure effective application of the hybrid approach. Future steps involve testing the framework in real-life capital projects development scenarios.

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Abbreviations

APM	Agile Project Management
TPM	Traditional Project Management
PM	Project Management
PMI	Project Management Institute
MANOVA	Multivariate Analysis of Variance

Chapter 1: Introduction

1.1 Research Significance:

Process automation is a field that involves the use of technology and systems to control and monitor industrial processes and machinery, reducing the need for human intervention. The primary goal is to enhance efficiency, reliability, and safety in various industries by automating repetitive tasks and complex processes. This field encompasses a wide range of applications, including manufacturing, chemical processing, power generation, and more.

Project work can be grouped into two categories: one with clear, tried-and-tested processes like making cars or appliances, and the other where things are new and uncertain, like designing software, solving unique problems, or inventing new solutions. The first type is predictable and low risk, while the second is full of unknowns and challenges.

The traditional way of managing projects is more suited to the predictable type of work, where you plan everything in advance and stick to the plan. However, for the uncertain and complex projects, a different approach is needed. This is where agile project management comes in. Instead of trying to figure everything out at the start, agile breaks the work into smaller, manageable chunks. It's like taking small steps, checking if you're going in the right direction, and adjusting as needed. This way, you can adapt quickly to changes and uncertainties, making it a better fit for high-uncertainty projects.

This report explores how the use of agile project management methods affects the overall performance of a company that primarily focuses on projects. Agile project management is an approach that emphasizes adaptability, customer collaboration, and continuous value delivery. In a projectized environment, understanding the effects of implementing agile practices is essential for achieving greater efficiency and better project outcomes.

In the world of process automation, where technology plays a big role in making work more efficient, agile Project Management gaining a lot of attention. This approach helps companies do a better job at using technology to automate their processes.

Automation is all about using machines and software to do tasks faster and with fewer mistakes. It's a big deal in many industries like oil and gas, manufacturing, transportation, and finance, where organizations want to save time and do things more accurately.

But here's the thing: making automation work in the real world can be pretty tricky. That's where Agile Project Management comes in. It's like a roadmap that helps organizations navigate the automation journey. It focuses on being adaptable, working closely with customers, taking small steps, and always delivering value. These are key principles that match the needs of the process automation field, which often has to change quickly and put customers first.

The utilization of Agile approach within the process automation business has emerged more recently in comparison to its inception within the software development domain. The use of Agile methodologies in this particular field has become increasingly prominent over the last decade due to the industry's encounter with expanding obstacles, shifting market dynamics, and the need to improve efficiency and flexibility in their automation initiatives.

Projectized companies are those where projects are the primary way of delivering products, services, and strategic goals. In these organizations, project management is a fundamental philosophy, not just a department. Key characteristics include temporary and unique projects, a dedicated project management structure, and the involvement of cross-functional teams, all of which play a vital role in achieving success.

1.2 Background:

The Traditional method could not keep pace with the development of software and rapid life changes and keep pace with the development and change of project requirements, when relying on traditional methods the project needs a long time to complete and this necessarily requires a large cost and the cost of redesign, development and change to suit the changing requirements is very large.

The historical evolution of Agile methodologies in process automation can be understood as dynamic response to the changing demands of the industries. The Agile principles, which first came to light in the early 2000s as a revolutionary technique in software development, have now expanded their scope and have been increasingly utilized in the field of process automation. The Agile manifesto, which was formulated in 2001, established a foundation for wider acceptance of Agile methodologies by highlighting the importance of collaboration, flexibility, and customer satisfaction. During the mid-2000s, there was an important change in the traditional approach as many companies began to acknowledge the constraints presented by traditional project management in the face of increasingly complex automation projects.

1.3 Problem Statement

Recognizing Challenges in Project Management for Process Automation:

1. Rigidity in Project Management Methods:

Traditional project management approaches may lack flexibility, making it difficult to adapt to the dynamic nature of the process automation field.

2. Limited Collaboration with Stakeholders:

Limited collaboration between project teams and stakeholders can lead to misalignments and hinder the successful delivery of automation solutions.

3. Scope Creep Management:

Controlling scope creep can be challenging in the process automation field, where evolving project requirements are common, leading to potential delays and increased costs.

4. Insufficient Focus on Continuous Improvement:

Traditional methodologies may lack systematic approaches to incorporating lessons learned from past oil and gas automation projects, limiting the industry's ability to continuously enhance project management practices.

5. Documentation Overload Impacting Project Delivery:

Overemphasis on extensive documentation in traditional project management may divert resources away from the actual delivery of solutions, potentially slowing down implementation.

6. Employee Well-being:

The demanding nature of process automation projects can impact the work-life balance of employees, potentially leading to burnout and decreased productivity.

1.4 Study objective

The study aims to achieve a comprehensive understanding of how the implementation of Agile Project Management methodologies can positively impact organizational success in the context of process automation. Specific objectives include evaluating the effectiveness of Agile practices, identifying key success factors, and providing actionable insights for organizations looking to optimize their process automation projects through Agile methodologies.

1.5 Significance of the Study

By implementing Agile Project Management techniques, organizations can optimize project timelines and costs by becoming more flexible and responsive to change. Increased project

success rates, better stakeholder collaboration, and effective risk management all contribute to the success of an organization. By fostering innovation, continuous improvement, and strategic alignment with business goals, organizations can navigate the dynamic landscape of process automation more effectively, ensuring sustained success in this rapidly evolving industry.

Chapter 2: Literature Review

2.1 Introduction

The objective of this chapter is to review the list of best practices that are used in agile project management, to find the critical reason of why process automation projects get delayed, and to group the list of agile project best practices into new categories to help reduce the potential delays in Process automation projects (Illustrated in Chapter X).

This literature review chapter follows a sequential order. First, the introduction of literature review in Section 2.1 describes objective and content of the literature search. Second, Section 2.2 conceptualizes and definitions about project management and project .

2.2 Project Management

Defining Project Management

Defining A Project

A project is a temporary endeavor with a specific goal or set of goals, typically involving a series of planned and coordinated activities undertaken to create a product, service, or result, and is constrained by factors such as time, budget, and resources (Project Management Institute, 2021).

Defining Project Management and Project Lifecycle

Project management involves planning, organizing, securing, and managing resources to achieve objectives within defined scope, time, cost, and quality constraints. It involves leading teams, guiding projects, and ensuring goals are met efficiently, on time, within budget, and to desired quality standards (Stellingwerf & Zandhuis, 2013).

The Project Lifecycle represents the sequence of phases that a project goes through from start to completion. While specific stages may differ depending on the project management methodology used, a typical project lifecycle includes the following:

- Initiation: Defining the project, its objectives, and obtaining approval or authorization to begin. Activities include defining the project scope, objectives, stakeholders, and conducting initial feasibility analysis.
- Planning: Creating a detailed project plan outlining the tasks, timelines, resource requirements, and potential risks (Westland, 2007).

- Execution: Putting the project plan into motion and carrying it out (Westland, 2007). Activities include coordinating people and resources, carrying out the project plan, and ensuring that project goals are met.
- Monitoring and control entails overseeing project performance, tracking progress, and making necessary changes (Lester, 2017). Monitoring project metrics, comparing actual performance to the project plan, and implementing corrective actions are all part of the job.
- Closing: Formalizing project acceptance and completing all activities. Project closure activities include obtaining final approval, releasing project resources, and documenting lessons learned. (Westland, 2007)

Figure 1: Project lifecycle.

Traditional Project Management

Traditional project management is a linear, sequential approach that follows a fixed plan developed at the beginning of the project. It is often used for well-defined projects with stable requirements and minimal anticipated changes. The Waterfall Methodology is a classic representation of traditional project management, which follows a sequential flow through distinct phases. Traditional project management also involves extensive project planning, using tools like Gantt charts and Critical Path Analysis. The project progresses through sequential

phases, with limited customer involvement during development. It places a strong emphasis on comprehensive documentation, rigid change control, and quality assurance at the end. Traditional project management may face challenges when dealing with projects that require high adaptability, flexibility, and frequent changes in requirements.

The traditional project management methodology also called Waterfall methodology because the project's progression through a series of distinct phases, similar to a cascading waterfall. Key characteristics include a linear sequence of activities, a one-way direction, a phased approach, and sequential documentation creation. Each phase has specific objectives and deliverables, with the completion of one serving as the entry point for the next (Kerzner, 2006).

Strengths of waterfall

The Waterfall model is a structured and predictable approach to project management, suitable for well-defined and stable requirements. It produces detailed documentation for understanding project progress and facilitating maintenance and future development (Dima & Maassen, 2018). The model is well-suited for the projects where requirements are clear from the beginning and changes are unlikely. Client involvement is crucial at key stages, and the sequential development ensures control and clarity. The linear progression makes project management straightforward (Kerzner, 2006). The Waterfall model is suitable for stable requirements, reduced client involvement during development, minimized scope creep, and effective in regulatory environments.

Weaknesses of waterfall

The Waterfall model has several weaknesses that make it less suitable for certain projects. These include rigidity and inflexibility, limited client involvement during development, late detection of defects, long time to deliver value, high risk of project failure, limited adaptability to changes, lack of partial deliveries, difficulty in managing large projects, limited client feedback, and not suitable for research and development projects. The Waterfall model's rigid structure makes it difficult to accommodate changes in requirements or address unexpected issues, while its limited client involvement may lead to misunderstandings or deviations from client expectations. Additionally, the model's long time to deliver value can be a drawback in fast-paced industries or markets (Dima & Maassen, 2018). Despite these limitations, modern methodologies like Agile have emerged as alternatives that address these limitations, making the Waterfall model a less suitable choice for projects requiring change, uncertainty, and adaptability.

2.3 Agile Project Management

Agile project management is a flexible and iterative approach that prioritizes adaptability, collaboration, and customer satisfaction. It emerged as a solution to the limitations of traditional methodologies. Key principles include iterative and incremental development, which involves breaking projects into small, iterative cycles called "sprints." Each sprint results in a potentially shippable product increment, allowing for continuous improvement and adaptability (Project Management, 2017). Agile values change and prioritizes responding to customer feedback and changing requirements, allowing teams to change priorities and features as the project progresses.

Continuous collaboration with customers and stakeholders is essential for Agile projects. Cross-functional teams with diverse skills are typically formed to encourage collaboration and reduce dependency. Agile teams are empowered to self-organize and make decisions, creating a sense of ownership, responsibility, and motivation.

Continuous value delivery is prioritized in Agile projects, allowing stakeholders to see tangible progress and early feedback. Regular reflection and improvement through retrospectives aid in increasing efficiency and effectiveness (Turner, 2020). Agile projects are divided into fixed-duration sprints, lasting two to four weeks, ensuring a consistent development cadence. The project backlog is dynamic and can be adjusted as priorities shift.

Agile methodologies have gained widespread acceptance in various industries, particularly software development. The Agile Manifesto guides teams and organizations in adopting an Agile mindset and practices.

The Agile Manifesto is a document that identifies four key values and 12 principles that its authors believe project managers should use to guide their work. The four core values of Agile as stated in the Agile Manifesto are as follows:

- Individuals and interactions more importance than processes and tools.
- Working software is higher priority than comprehensive documentation.
- Responding to change over following a plan.
- Customer collaboration is prioritized over contract negotiation.

The twelve principles of agile manifesto are presented in below table 2.1, The application of Agile principles extends beyond IT projects and is demonstrated in various sectors, including the Process automation. According to the Project Management Institute (PMI), 71% of organizations

favor the Agile approach, enabling them to develop the capability to understand and adapt to both external and internal environments. This adaptability results in the delivery of products that are relevant, high-quality, competitive, and cost-effective (PMI, 2018). In the Agile framework, teams consistently assess requirements in relation to potential risks, leading to adjustments in the scope of work at the commencement of each iteration. The utilization of self-organized teams fosters collaborative interactions, facilitating a pragmatic balance among project constraints related to scope, risk, and convenience. This approach ensures an agile and responsive project environment across diverse industries, including those with unique challenges such as the process automation sector.

Table 1: Agile manifesto principles (Cole & Schotcher, 2016).

Serial	Agile manifesto principles	Relevance to process automation projects
1	The highest priority is to satisfy the customer through early and continuous delivery of valuable software.	Ensure the continuous delivery of valuable solutions, systems, and components.
2	Welcome change requests even at late stage of a project.	In process automation project management, embracing change requests even at a late stage allows for adaptability to evolving requirements, ensuring the system aligns with operational needs.
3	Deliver working software on a regular basis, with a preference for shorter timescales “Sprint”. This period can last anywhere from two weeks to several months.	Value-added components can be delivered on time and on a regular basis.
4	Businesspeople and developers must work together daily throughout the project.	Silos are minimized, and cooperation is encouraged.
5	Build projects around motivated individuals.	Projects must be built around motivated individuals by providing them with the

		environment, support, and trust they require. Motivate the team by setting shared objectives that are aligned with strategic business goals.
6	Face-to-face communication is the most efficient and effective way of conveying information to and within the team.	Enhance face-to-face communication among team members by scheduling regular meetings, creating collaborative spaces, and fostering a culture of open dialogue, ensuring effective interpersonal interaction.
7	Working software is the primary measure of progress.	Focus on working system meets customer requirements. Rather than contract deliverables. Doing continuous testing, validation, and implementation of automation solutions to ensure functionality and efficiency.
8	Agile processes promote sustainable development to maintain steady pace.	Prioritize workloads, set realistic goals, encourage continuous improvement, foster effective communication, invest in training and skill development, automate repetitive tasks, conduct regular retrospectives, manage technical debt, foster cross-functional teams, prioritize work-life balance, define completed tasks, and implement continuous delivery practices.
9	To reduce the amount of unfinished work, simplicity is essential.	Simple design reduces risk of failure.
10	Good design improves agility by paying continuous attention to technical excellence and quality.	The better understand of project requirements leads to avoid rework and enhance the quality.

11	Self-organizing teams.	Create collaborative cross reference teams and Self-organized.
12	Regular retrospective meetings for improvement.	Facilitate meetings to take the feedback from stakeholders to work on continuous improvement.

Agile project management best practices

Agile project management includes a set of best practices that place a focus on flexibility teamwork, and iterative development. Below is a summary of important Agile best practices:

- Iterative and Incremental Development: the method breaks down the project into small, manageable iterations, allowing for continuous improvements and adjustments.
- Scrum Framework: A popular Agile framework with defined roles, events, and artifacts, emphasizing collaboration, transparency, and adaptability.
- Cross-Functional Teams: Assembles teams with diverse skills necessary to complete all aspects of a project.
- Daily Stand-up Meetings: Brief, daily meetings where team members share updates on progress, discuss challenges, and plan for the day.
- Sprint: A short, time-boxed period when a scrum team works to complete a set amount of work.
- Sprint Planning: Occurs at the beginning of each sprint to define the work to be done and set priorities.
- User Stories and Backlog: Describes project requirements from an end-user perspective and organizes them in a prioritized backlog.
- Retrospectives: Regularly scheduled meetings at the end of a sprint to reflect on what went well, what could be improved, and how to implement those improvements.
- adaptive Planning: Emphasizes the ability to quickly adapt to changing requirements throughout the project. Responds effectively to evolving priorities, reduces the risk of delivering outdated features, and maximizes project value.
- Burndown charts: Visual representations that illustrate the progress made in completing tasks relative to the amount of work that still needs to be accomplished within a given timeframe.

- Welcome to Change: Welcomes changing requirements, even late in the project, to harness new opportunities.

In summary, Agile project management best practices are designed to foster collaboration, flexibility, and continuous improvement throughout the project lifecycle. These practices empower teams to deliver high-quality products that meet customer needs in a rapidly changing environment.

2.4 Hybrid Project Management

Hybrid project management represents a flexible and adaptive approach that combines elements from both traditional and agile methodologies. In contemporary project environments, where uncertainties and changing requirements are common, the hybrid model seeks to strike a balance between the structured predictability of traditional project management and the dynamic responsiveness of agile practices (Cole & Schotcher, 2016). This approach acknowledges that not all projects fit neatly into one methodological framework and aims to provide a tailored solution that accommodates diverse project needs.

Advantages of Hybrid Project Management:

The hybrid project management approach offers several notable advantages. Firstly, it provides adaptability to changing project conditions, allowing teams to respond effectively to evolving requirements. Secondly, by incorporating both phased structures and agile flexibility, it enables better risk management, minimizing the impact of uncertainties on project outcomes. Additionally, the hybrid model promotes a culture of continuous improvement, drawing on lessons learned from both traditional and agile practices (Cynthia Snyder, 2022). This balance between structure and adaptability contributes to a more robust and responsive project management strategy.

Disadvantages of Hybrid Project Management:

However, the hybrid project management approach is not without its challenges. The complexity introduced by managing both sequential phases and iterative development concurrently can pose difficulties in communication and coordination. The need for team members to be proficient in both traditional and agile methodologies may require additional training, potentially leading to resistance to change. Customizing the hybrid approach to suit specific project needs can be complex, and there may be challenges in integrating different tools and techniques. Striking a

balance between stakeholder preferences for detailed plans and flexibility can lead to communication gaps, affecting project understanding. Despite these challenges, the success of the hybrid model depends on careful consideration of project characteristics and effective management of its inherent complexities (Cynthia Snyder, 2022).

2.5 Why process automation projects get delayed.

Several factors can contribute to delays in process automation projects. Identifying the critical reasons for these delays is essential for effective project management. Here are some key factors expressed from (Oshungade, 2006):

- System Complexity: The complexity of process automation systems, especially in industries like oil and gas or manufacturing, can cause project delays. For example: it can be difficult to integrate multiple technologies and establish seamless communication between them.
- Changing Requirements: Project timelines can be affected by changing project requirements, whether due to regulatory changes, shifts in business priorities, or technological advancements. Delays are made worse by an inability to manage and adapt to changing requirements.
- Inadequate Planning: Delays can occur as a result of poorly defined project plans, inaccurate estimations, or insufficiently detailed scope. Effective project planning is important, including realistic timelines and resource allocation.
- Lack of Skilled Resources: A lack of skilled personnel slows down project progress significantly. Insufficient expertise leads to longer troubleshooting times and lower efficiency.
- Communication Gaps: Poor interaction among project stakeholders, such as project team members, project managers, and end users, can result in misunderstandings, rework, and delays in decision-making processes.
- Unforeseen Technical Challenges: Unexpected technical challenges, such as hardware compatibility issues or software bugs, can cause significant delays if not addressed promptly and effectively during the implementation phase.

Table 2:Potential solutions for several causes of delay.

Cause of delay	Potential solutions

System Complexity	Employing incremental development cycles and regular feedback loops can address system complexity by allowing for continuous adjustments and improvements in integrating multiple technologies and ensuring seamless communication.
Changing Requirements	Fostering a culture of flexibility and implementing iterative development cycles can mitigate the impact of changing requirements. Regular stakeholder collaboration and continuous reassessment allow for adaptive responses, ensuring timely adjustments to project plans in response to regulatory changes, shifts in business priorities, or technological advancements.
Inadequate Planning	Ensure comprehensive project planning with realistic timelines and resource allocation; address inadequate planning through iterative reviews and adjustments during the project's agile cycles.
Lack of Skilled Resources	Project managers can address the lack of skilled resources by investing in continuous training programs to upskill existing team members and actively seeking external talent with the required expertise, thereby improving project efficiency, and reducing troubleshooting times.
Communication Gaps	Fostering regular communication through daily stand-up meetings and utilizing collaborative tools can help bridge communication gaps, enhance understanding,

	and expedite decision-making processes among project stakeholders.
Unforeseen Technical Challenges	prioritize regular and collaborative communication within the team, fostering an environment where challenges can be quickly identified and addressed through adaptive iterations and continuous problem-solving. Additionally, employing agile practices like frequent testing and integrating feedback loops can help detect and resolve technical issues early in the implementation phase.

Chapter 3: Methodology

3.1 Introduction

Chapter 2 summarized and analyzed the existing publications that explores how project management approaches are applied in process automation projects.

This chapter outlines a structured methodology aimed at fulfilling the research objectives while considering the latest methodological approaches. Drawing from (Saunders, Lewis, & Thornhill, 2009), the research plan consists of defining the problem, framing research questions, and conducting an in-depth review of pertinent literature. These elements collectively inform the selection of the most suitable research methodology. Hence, this chapter emphasizes establishing and providing reasoning for the chosen research methods for data collection, analysis, and interpretation.

3.2 Types & methodologies of research

- Quantitative research methods: Quantitative research methods are used to collect information using numerical data. It is used to quantify opinions, behaviors, or other variables that have been defined. These are predetermined and follow a more structured structure. Surveys, longitudinal studies, polls, and other methods are commonly used.
- Qualitative research methods are used to collect information that is not numerical in nature. It is employed to elicit meanings, opinions, or underlying causes from its subjects. These techniques are either unstructured or semi-structured. The sample size for such a study is typically small, and it is a conversational method of providing more insight or in-depth information about the problem. Focus groups, experiments, and interviews are some of the most popular methods.

3.3 Research design

A research design is positivist in the sense that it encompasses how to select and accumulate data, as well as scaling and measurement approaches, tests, and data assessment. Furthermore, it describes a collection of methods and investigative elements combined in a reasonably logical manner so that the topic under study can be addressed efficiently, thus providing a solution blueprint.

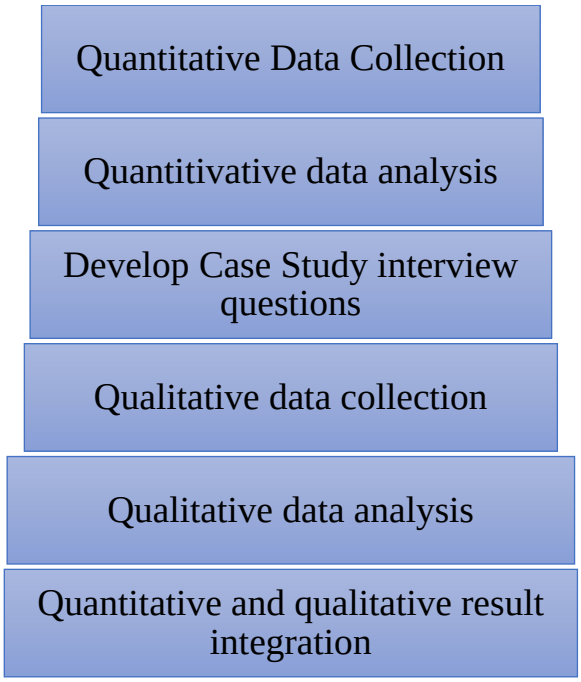

Figure 2: Adopted research design (Created by the researcher)

This study utilized a research design depicted in Figure 2, employing a combination of quantitative and qualitative sequential mixed methods. Initially, quantitative data were collected through cross-sectional questionnaires targeting project and program managers, planners, coordinators, and engineers—key roles critical to project success and integral to the project management office (PMO). Subsequently, quantitative data analysis using statistical information was conducted to provide preliminary findings and guide the formulation of interview questions for the case study. Following (Kvale, 2011) recommendations for interview conduct, the research designed and developed interview questions. The next step involved semi-structured interviews, during which the gathered qualitative data were recorded and transcribed to facilitate analysis. Triangulation and integration of results from both qualitative and quantitative aspects of the research were performed to validate the findings.

3.4 Data Collection

- Quantitative data collection:
  According to (Cresswell, 2020), in quantitative research, a theory explains and predicts the relationship between independent and dependent variables. Quantitative research, following a positivist model, uses methods like surveys to collect data. These methods allow for large sample sizes, computer analysis, and generalizing findings to bigger populations. In this study, a questionnaire was created following guidelines to avoid errors and collect

quantitative data. Likert scales were used to measure responses, and a 5-point scale was chosen for simplicity. Random sampling and a case study in the process automation sector were employed, involving participants like engineers and managers. The acceptable sample size was determined based on the total population of the company and the study included 12 research participants.

- Qualitative data collection:

  Qualitative data in this study were collected through semi-structured interviews, following (Kvale, 2011) guidelines. These interviews used open-ended questions to explore and interpret the results obtained from the earlier quantitative phase of the study. The aim was to dig deeper into participants' experiences and opinions. The interviews focused on employees directly involved in process automation projects. The questions also addressed the potential adoption of the agile project method for project efficiency.

  The process included sending information about the research project, methodology, and ethical considerations to project leaders, who then shared it with potential respondents. Some interviews were face-to-face, while others were conducted on teams due to scheduling. To ensure reliability and validity in qualitative research and avoid bias, three external reviewers were consulted.

3.5 Data Analysis

This study used both quantitative and qualitative data. The first phase involved collecting quantitative data and analyzing it. Different analysis methods were chosen based on the research variables and their relationships. This addressed the first research question. In the second phase, qualitative data from interviews were analyzed using thematic analysis, examining common ideas and patterns. This addressed the second and third research questions about agile project management best practices and reducing delays in process automation projects.

Combining survey results and interviews allowed for triangulation, increasing the validity and reliability of the study. Triangulation helps gather diverse data and perspectives, enhancing the research's outcomes. The identified delays in process automation projects, were evaluated to see if they influence the relationship between independent variables (Iteration Planning, Retrospective Meetings, Daily Stand-Up Meeting, Communication and Collaboration, and Solving Contractual Issues) and the dependent variable of project delays.

3.6 Mapping the methodology to each research question

Research Question	Research Design Technique	Description
What Agile Project Management (APM) best practices can be applied in the Traditional Project Management framework to reduce delays in process automation projects?	Quantitative	The quantitative analysis aim to find the best practices of agile that are used in traditional project management, to reduce delays in process automation projects.
How can agile project management best practices be applied in the Traditional Project Management framework in process automation projects?	Qualitative	Semi-structured interviews were suitable as a tool to examine each respondent's personal
How can a Hybrid Project Management framework (Traditional/Agile) address project complexity to reduce delays in process automation projects?	Qualitative	experience and opinions. The identified delays of process automation were assessed to determine whether they act as moderators between the six primary independent variables (Iteration Planning, Retrospective Meetings, Daily Stand-Up Meeting, Communication and Collaboration, and Solving Contractual Issues) in more depth than the previous step.

3.7 Threats to validity and reliability

Validity measures how accurately an instrument assesses its intended purpose, while reliability indicates the consistency of results over time and their accurate representation of the study population. Tests were conducted to ensure validity and reliability in data collection, analysis, and reporting. These tests included measures like test-retest and internal consistency, as well as assessments of face and content validity. Face and content validity were ensured by reviewing items for errors, unclear language, or complexity. The reliability analysis, presented in the next chapter, includes Cronbach's alpha values to show the scale's reliability (Cronbach, 1951).

In addition to result testing, objectivity was maintained throughout all research processes. The use of consistent instruments and theoretical evidence from the literature further supports the validity and reliability of the results. Efforts were made to prevent bias in data collection and reporting.

Chapter 4: Conceptual Framework

4.1 Conceptual framework

The literature review emphasizes significant concerns associated with delays and failures in process automation projects. This study aims to assess the viability of implementing a hybrid project management model that integrates both traditional and Agile Project Management (APM) methods within process automation sector. The objective is to pinpoint APM best practices specific to process automation industry and develop a comprehensive hybrid PM methodology tailored to the sector. The proposed methodology is anticipated to mitigate project delays and address the escalating complexity of projects. The findings of this research are anticipated to be a pivotal contribution to the field, offering valuable insights into process automation sector.

As depicted in Figure 3, this study identifies six Agile best practices that can be incorporated into

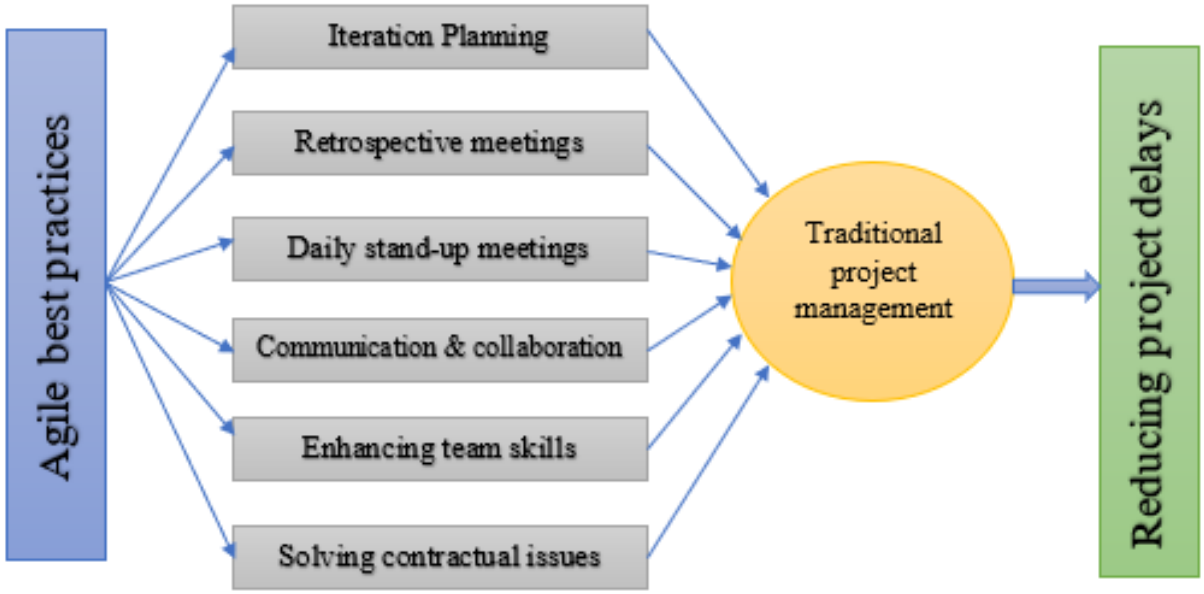

Figure 3: Proposed conceptual framework.

a Traditional Project Management (TPM) framework to enhance the execution of process automation projects. The key hypotheses are elaborated below.

- Introducing Agile iteration planning in a traditional project management framework can reduce project delays.

  (Serrador & Pinto, 2015) argue that Agile iterations are a suitable initial approach for agile project management due to their focus on interactions and individuals, which facilitates prompt customer feedback prior to project completion. (W.H.A. Al-Zubaidi, 2018) similarly assert that iteration planning ought to take place within the framework of a project wherein each domain has a unique development path that is subdivided into phases or iterations. Iteration planning enhances the responsiveness of business processes to emergent requirements, thereby enabling the project to be reconfigured and recovered from during development. Consistent achievement of development milestones expedites the delivery of artifacts and deliverables to stakeholders, which can then be applied to subsequent phases of the project (Conforto & Amaral, 2016). Additionally, iterations facilitate the incorporation of tasks with other ongoing projects and offer methods for concurrently processing tasks. As a result, the implementation of iterative planning within a waterfall framework would facilitate the achievement of organizational objectives and enhance the efficiency of project delivery in the process automation industry.

  In process automation projects employing iteration planning, the planning cycle is repeated throughout the project lifecycle based on continuous feedback (Conforto & Amaral, 2016). This iterative approach allows the project team to effectively manage changing needs, identify new opportunities and risks, and enhance adaptability (W.H.A. Al-Zubaidi, 2018). Team members' involvement and commitment to developing and updating the project plan, along with progress monitoring, contribute to effective communication and interaction, reducing project execution time in a complex environment (Heijstek, Chaudron, & Lizarazo, 2011). Iteration planning plays a crucial role in addressing process automation delays by linking contractual issues to artifacts produced in each iteration, as opposed to commitment to completing work on time (Osorio et al., 2011). Consequently, an incremental approach to decision-making is enhanced, effectively managing each portion of a project iteration.

- Introducing Agile retrospective meetings in a traditional project management framework can reduce project delays.

  According to (Matthies, 2019),looking back on project progress is crucial for its success. Implementing effective retrospectives in projects can significantly enhance job satisfaction,

teamwork, and productivity while mitigating potential time overruns. (Fogelström, 2010) emphasize the importance of managing project dynamics with flexibility to ensure efficiency, suggesting that adopting best practices in Project Management (APM) enables managers to navigate changes and uncertainties within the operational environment. Additionally, self-organized teams, aware of project objectives, can exacerbate issues like poor scheduling and communication. (Fogelström, 2010) further propose integrating APM into project retrospectives or meetings using a structured approach to convince stakeholders to maintain efforts in managing the project effectively, aligning with project needs and the evolving environment.

(Andriyani, 2017) argues that the Agile methodology's "inspect and adapt" principle is embodied in retrospective meetings, allowing Agile teams to regularly evaluate and adjust their processes. These meetings facilitate the development of action plans, pinpoint areas for improvement, and address potential obstacles preemptively. Retrospectives also enable process automation projects to adapt to feedback from project owners and vendors and assess external factors that could impact project performance. Informal meetings can additionally expedite decision-making, support inexperienced contractors, and foster better collaboration.

- Introducing daily standup meetings in a traditional project management framework can reduce project delays.

  According to (Stray, Sjøberg, & Dybå, 2016). Agile daily stand-up meetings facilitate rapid feedback among team members, emphasizing the self-organizing team dynamic. Consequently, they observed that teams can make timely decisions to prevent undesirable outcomes or resource wastage. During the design phase of construction projects, traditionally managed using the waterfall model, the Scrum approach within the Agile framework, as highlighted by them, proves beneficial for monitoring daily project progress. Therefore, APM incorporates the Scrum methodology to enhance coordination and ensure transparency throughout the design phase, as noted by (Demir, 2016). In projects, adopting the Scrum approach guarantees well-designed and coordinated initial project stages, minimizing the risk of delays commonly associated with Traditional Project Management (TPM) techniques.

- Introducing Agile communication and collaboration in a traditional project management framework can reduce project delays.

  Effective communication and collaboration within teams are crucial components of Agile Project Management (APM). Without these elements, there's a risk of overlooking important details, leading to inadequate change management and diminished overall quality. Conversely, with robust communication practices, errors can be detected and rectified in a timely manner, preventing any negative impact. Similarly, a well-established team with strong communication fosters better project scope elaboration and development.

  The development of project scope relies heavily on efficient communication, along with the expertise and experience of team members. Without the requisite experience and specialized knowledge among team members, the project scope may not accurately align with the proposed project goals and execution process. (Aramayo, 2013) demonstrates successful achievement of hypotheses and objectives through their Project Management framework, the Petrobras Project Development and Execution Programme (PRODEP). This framework incorporates approved PM guidelines, primarily from PMBOK, integrating them into the supply chain and featuring interconnected stages that facilitate communication of intermediate results.

  In process automation projects, effective communication and collaboration ensure that all stakeholders are informed of evolving objectives, potential changes in the environment, or resource utilization adjustments. Inadequate communication often leads to delays, resulting in increased project expenses. Therefore, well-defined communication channels mitigate potential delays in process automation projects duration. Additionally, the organizational structure and the project steering committee play a significant role in achieving project objectives by fostering improved communication and collaboration among team members.

- Introducing enhancing team skills in a traditional project management framework can reduce project delays.

  (Ruqaishi & Bashir, 2015) highlighted the significance of planning and scheduling issues leading to delays in process automation related projects, potentially stemming from a shortage of suitably trained and experienced contractors. To mitigate these challenges, project teams must identify effective software solutions for schedule management and ensure team members possess the requisite skills to enhance project performance. Insufficiently trained and

experienced team members can contribute to subpar site management, resulting in defects and project delays.

Agile Project Management depends significantly on performance, leadership, and coordination. Self-managing professionals within project teams who are independently focused, share decision-making authority, and execute tasks in an integrated and timely manner. Skilled professionals are expected to encompass the 'think talent triangle,' incorporating technology and project management skills, strategic business acumen, and leadership abilities. Also, the technology-adept professionals can significantly improve Agile development, with teams possessing diverse skill sets tailored to task complexity and adaptive management styles being instrumental in project success.

- Introducing contractual issues in a traditional project management framework can reduce project delays.

  Throughout the execution of a project, it is crucial to adhere to an agreed-upon payment schedule for contractors and subcontractors, enabling them to cover essential expenses such as equipment and personnel salaries. Payment delays stand out as significant contributors to project delays in the Gulf region (Ruqaishi & Bashir, 2015).Similarly, they also highlight contractual issues leading to a shortage of construction materials in Iraq, attributed to inexperienced customs personnel, inadequate management of material factories, and the closure of production plants.

  Other challenges such as poor site management by contractors and subcontractors, unforeseen accidents, ineffective contractual terms, and the selection of bidders solely based on cost were identified as factors impacting project efficiency.

4.2 Chapter summary

This chapter has reviewed relevant literature to elucidate the variables and context of this study. It has highlighted a wealth of information on traditional and Agile Project Management (PM) theories and their applications across various industries. However, there is a noticeable gap in literature regarding their adoption in industrial process automation capital projects, particularly in the context of hybrid PM methods.

The literature review has shown that Agile Project Management (APM) can enhance the efficiency and effectiveness of industrial process automation projects in uncertain and complex environments, while the waterfall approach is well-suited for smaller projects. Yet, there remains

a research void regarding the feasibility of incorporating Agile best practices within a waterfall framework in process automation projects. Thus far, little attention has been given to understanding the challenges organizations encounter when integrating Agile best practices, particularly within sectors like construction.

This research gap underscores the importance of this study, which examines the adoption of Agile best practices within Traditional Project Management (TPM) approaches process automation sector. By delving into some of the causes of delays within this domain, the rationale for adopting a hybrid approach becomes more compelling.

Chapter 5: Analysis and Findings

5.1 Introduction

This chapter analyses the survey and interview data from PM professionals process automaton sector. It aims to find out how Agile best practices can be used in their current Traditional Project Management (TPM) projects to avoid delays, which are very common in the sector. The chapter starts with the quantitative results from the survey, which was designed to collect primary data on APM best practices and key factors that can help TPM projects. The survey also asked about the respondents' project framework and job titles, and the results are shown using frequency and percentages. The survey data was used to find the variables that cause delays in process automation projects. The survey also asked about the respondents' views on Agile values, and the average scores, ranges, and standard deviations (SD) for each item are reported. Then, a reliability analysis was done to check the consistency of the questionnaire. The correlation between the variables was examined, and this research found that they are significantly and positively related. Cronbach's alpha tests were used for this, and all the tests showed that the scaled items are reliable, with alpha scores above 0.7 (Cohen, 2013). Also, a regression analysis was done to see the combined effect of the six independent variables on project delays, which explained 33.6% of the difference in scores. The chapter also presents the qualitative analysis, starting with the demographic details of the eight interviewees. Their opinions on the reasons for project delays, the best agile project management (APM) practices for industrial process automation projects, and their views on each of the six independent variables, which are also the best practices, are presented. Research questions 2 and 3, about the factors that support the hybrid framework and the suggestions for using it in the industrial process automation sector, are also discussed based on the interviewees' opinions.

5.2 Description of analysis Techniques

For scale creation, each of the core items that made up the independent variables. These items were measured on a 5-point Likert scale, where 1 meant strongly disagree and 5 meant strongly agree. Each item had a theoretical range of 1–5 and a maximum score of 5. The tables for each independent variable showed the mean scores, actual ranges, and SDs for each item, as explained in the next subsections. The six main independent variables (Iteration Planning, Retrospective Meetings, Daily Stand-Up Meeting, Communication and Collaboration, and Solving Contractual

Issues) were composite variables, so reliability analyses were needed to check for internal consistency.

5.3 Quantitative Results

Participants Demographic Characteristics

The research survey aimed to reach 26 research participants who were involved in process automation projects. The researcher contacted various experts and professionals, such as engineers, coordinators, planners, and project managers, from different process automation companies. Out of the 26 participants, 5 (19.23%) had 0 to 5 years of experience in their role; 12 (46.15%) had 5 to 10 years of experience; 6 (23.08%) had 10 to 15 years of experience; and 3 (11.54%) had more than 15 years of experience. Moreover, 26 (100 %) worked on process-related projects.

Table 3: Participants' Experience for Quantitative Data Analysis.

Participant's Experience Range	Percentage (%)
0-5	19.23
5-10	46.15
10-15	23.08
More than 15 years	11.54

Table 4: Job Titles of Participants

Job Title	n	Percentage
Consultant	2	7.7%
Specialist	4	15.4%
Senior Engineer	3	11.5%
Senior Planner	0	0%
Engineer	8	30.8%
Project Manager	7	26.9%
Other	2	7.7%
Total	26	100%

Demographics and Project Variables

A MANOVA was utilised to estimate the relationships between the demographic variables of gender, age, experience, and job title in addition to project-related variables such as project field,

type of PM framework, project lifecycle, project size, and location. Gender was not found to be a significant predictor for any of the dependent variables.

Project delays were significantly related to the type of PM framework ($p = 0.00$, $F = 7.64$, $df = 2$, partial eta-squared = .129). The effect size of this relationship was estimated utilizing (Cohen, 2013) description, which states that partial eta-squared values from .01 to .06 are small, .06 to .1 are moderate, and .14 and above are large. Consequently, this relationship has a large effect size. The customised TPM framework ($M = 4.26$, $SD = .34$) differed from the PMI ($M = 3.63$, $SD = .17$) and the PRINCE2 ($M = 4$, $SD = 0$) projects. The findings show that 97.2% of participants see that TPM is currently adopted as the dominant approach. Note, the standard deviation measures show that the observed values are close to the mean; therefore, 95% of values fall within two standard deviations of the mean.

MANOVA (Multivariate Analysis of Variance): This statistical technique was used to explore relationships between several independent variables (demographic and project-related) and multiple dependent variables. The study identified a significant relationship between project delays and the type of project management (PM) framework used. The p-value (probability) associated with this relationship is 0.00, which indicates strong evidence against the null hypothesis (i.e., no relationship).

Effect Size: The effect size (partial eta-squared) for this relationship is 0.129. According to Cohen's guidelines:

Values from 0.01 to 0.06 are considered small effects.

Values from 0.06 to 0.1 are considered moderate effects.

Values 0.14 and above are considered large effects.

Since the partial eta-squared value is 0.129, this relationship has a large effect size. In practical terms, the type of PM framework significantly influences project delays.

Customized TPM Framework vs. PMI and PRINCE2:

The mean (average) project delay for the customized TPM framework was 4.26 with a standard deviation of 0.34.

The mean project delay for PMI was 3.63 with a standard deviation of 0.17.

The mean project delay for PRINCE2 was 4.0 with a standard deviation of 0 (which means all values were the same).

The findings suggest that the customized TPM (Traditional Project Management) framework had the longest average project delay, followed by PRINCE2 and then PMI.
Additionally, 97.2% of participants perceived that TPM (presumably the customized TPM framework) is currently the dominant approach.
Standard Deviation and Data Spread:
The small standard deviations (close to the mean) indicate that the observed values cluster around the average.
Approximately 95% of the data points fall within two standard deviations of the mean.

5.4 Application of Agile Best Practices in a Traditional Framework

Current Context

Below table presents specific questionnaire items aimed at gathering the opinions of respondents regarding Agile values.

Table 5: Respondents Ratings for Agile Values

Item	Minimum	Maximum	Mean	SD
Individuals and interactions are prioritised over tools and processes	2	5	4.32	0.684
Collaborating with customers should be prioritised over contract negotiation	3	5	4.44	0.570
Working software is prioritised over comprehensive documentation	3	5	4.31	0.667
Responding to change is prioritised over following a plan	1	5	4.05	0.785

The respondents largely agreed with Agile values, particularly prioritizing collaborating with customers over contract negotiation, individuals and interactions over tools and processes, and working software over comprehensive documentation. These values were rated highly, with means ranging from 4.31 to 4.44.

Furthermore, a majority of participants (85.5% to 91.8%) believed that adopting these Agile principles could potentially reduce delays in the delivery of industrial automation projects. Specifically, they agreed that prioritizing individuals and interactions, collaborating with customers, and focusing on working software could lead to more efficient project delivery, with varying degrees of agreement ranging from strongly agreeing to disagreeing. Overall, the

majority of participants saw the potential benefits of aligning with Agile values in the context of industrial automation project management.

Iteration Planning

The items from the iteration planning scale are detailed in Table 6, showcasing a generally high level of agreement among respondents. Overall, participants expressed agreement that iteration planning could enhance project management processes. The highest-rated items focused on improving planning and scheduling processes, as well as the idea that dividing projects into smaller iterations could mitigate unknown risks.

Specifically, the results indicate that a majority of participants (80.2%) agreed that iteration planning could introduce more flexibility into waterfall projects. Furthermore, the integration of iteration planning was seen as potentially increasing the acceptance of project changes and thus expediting the delivery of process automation projects, with a majority of participants (82.1%) in agreement.

Regarding risk mitigation, the majority of participants (68.9%) believed that breaking down large projects into smaller iterations could help identify and address unidentified risks that might otherwise delay project delivery.

Lastly, introducing iteration planning in project management was strongly supported by participants (73.6%), with many seeing it as a means to improve planning and scheduling processes and resolve issues related to overrides. Overall, the majority of participants acknowledged the potential benefits of incorporating iteration planning into project management practices.

Table 6: Descriptive Statistics (Iteration Planning)

Item	Minimum	Maximum	Mean	SD
Increase flexibility	2	5	3.88	0.581
Increase the frequency of acceptance of project changes	2	5	3.90	0.631
Dividing the project into smaller iterations could reduce unidentified risks	3	5	4.38	0.710
Improve planning and scheduling processes	1	5	4.40	0.813

Retrospective Meetings

In this survey section, participants were asked whether incorporating retrospective meetings into a waterfall model could enhance agility. The retrospective meetings scale, detailed in Table 5.6,

received moderate-to-high agreement across all items. Overall, respondents concurred that holding retrospective meetings can positively impact the project management (PM) process. The highest-rated item was “Enabling project managers to adapt more effectively to changes” (mean score = 4.69, standard deviation = 0.575). Although the lowest-scoring item, “Facilitating frequent adjustment of processes,” still garnered a generally positive stance with a mean score of 4.14 (standard deviation = 0.624).

Specifically, 67.0% of participants agreed that retrospective meetings could lead to frequent process adjustments in waterfall projects. Among them, 10.4% strongly agreed, 16.0% remained neutral, 5.7% disagreed, and 0.9% strongly disagreed.

Additionally, a majority believed that integrating retrospective meetings into a traditional model could involve clients in project planning. Specifically, 71.1% strongly agreed, 15.1% agreed, 6.6% were neutral, 4.7% disagreed, and 1.9% strongly disagreed.

Lastly, 70.8% of respondents agreed that integrating retrospective meetings allows managers to mitigate risks before they escalate into major issues. Among them, 14.2% strongly agreed, 8.5% remained neutral, 3.8% disagreed, and 2.8% strongly disagreed.

Table 7: Descriptive Statistics (Retrospective Meetings)

Item	Minimum	Maximum	Mean	SD
Facilitate frequent adjustment of processes	2	5	4.14	0.624
Enable involvement of clients in project planning	2	5	4.45	0.571
Enable project managers to adapt more effectively to changes	2	5	4.69	0.575
Enable project managers to mitigate risks before they become issues	2	5	4.25	0.618

Daily Stand-up Meetings

In this survey section, participants were asked whether incorporating daily stand-up meetings into a waterfall model could enhance agility. The daily stand-up meetings scale, detailed in Table 5.7, received moderate-to-high agreement across all items. Overall, respondents concurred that holding daily stand-up meetings can positively impact the project management (PM) process. The highest-rated item was “Enabling project managers to adapt more effectively to changes” (mean score = 4.69, standard deviation = 0.575). Although the lowest-scoring item, “Facilitating frequent adjustment of processes,” still garnered a generally positive stance with a mean score of 4.14 (standard deviation = 0.624).

Specifically, 67.0% of participants agreed that daily stand-up meetings could lead to frequent process adjustments in waterfall projects. Among them, 10.4% strongly agreed, 16.0% remained neutral, 5.7% disagreed, and 0.9% strongly disagreed.

Additionally, a majority believed that integrating daily stand-up meetings into a traditional model could involve clients in project planning. Specifically, 71.1% strongly agreed, 15.1% agreed, 6.6% were neutral, 4.7% disagreed, and 1.9% strongly disagreed.

Lastly, 70.8% of respondents agreed that integrating daily stand-up meetings allows managers to mitigate risks before they escalate into major issues. Among them, 14.2% strongly agreed, 8.5% remained neutral, 3.8% disagreed, and 2.8% strongly disagreed.

Table 8: Descriptive Statistics (Daily Stand-Up Meetings)

Item	Minimum	Maximum	Mean	SD
Emphasise the importance of self-organising teams	2	5	4.70	0.572
Reduce the potential for misguided objectives and ensure that deliverables are connected with objectives	3	5	4.13	0.438
Reduce conflicts among the project's essential players	3	5	4.15	0.432
Enable teams to evaluate and discover ways to adjust their processes in a frequent manner	3	5	4.13	0.48
Provide an opportunity to develop an action plan that identifies areas of improvement	3	5	3.73	0.684

Among the participants, **47.2%** expressed uncertainty about whether integrating daily stand-up meetings could create an opportunity to develop an action plan and identify areas for improvement. However, those who agreed (**34.9%**) and strongly agreed (**14.2%**) with this concept outnumbered the dissenters (**3.9%** disagreed and **3.9%** strongly disagreed).

Communication and Collaboration

Below table provides a synopsis of statements concerning communication and collaboration, reflecting predominantly positive outcomes. The item with the highest rating was "Reduce delays in decision-making" (M = 4.62, SD = .593), while "Facilitate improvements in coordination between project teams" received the lowest rating (M = 4.05, SD = .695). A significant majority (75; 70.8%) strongly agreed that integrating these aspects would decrease decision-making delays, with only three and four participants disagreeing and strongly disagreeing, respectively.

Additionally, 76.4% of respondents concurred that communication and collaboration could enhance risk planning and management, facilitating swifter project execution. Concerning

project scope, 75.5% of participants believed that implementing efficient communication and collaboration strategies could refine project scope definition, particularly crucial for expediting notably large and complex projects. Regarding Agile best practices' capabilities, minimal disagreement was observed, with only two and three participants expressing disagreement and strong disagreement, respectively, while others either strongly agreed or remained neutral.

Table 9: Descriptive Statistics (Communication & Collaboration)

Item	Minimum	Maximum	Mean	SD
Reduce delays in decision-making	3	5	4.62	0.593
Facilitate improvements in the definition of the project's scope	4	5	4.4	0.491
Facilitate improvements in risk planning	3	5	4.38	0.577
Allow project personnel to better understand client requirements	3	5	4.37	0.522
Facilitate improvements in coordination between project teams	3	5	4.05	0.695

Enhancing Team Skills

Table 10 presents the components of the team skills scale. A noteworthy consensus was reached across all items, collectively marking them as the most highly rated on the questionnaire. Particularly, the survey findings underscore that by bolstering team skills within a project, project managers can greatly enhance interaction and support among team members, thereby expediting project delivery.

Table 10: Descriptive Statistics (Team Skills)

Item	Minimum	Maximum	Mean	SD
Reduce delays in decision-making	3	5	4.39	0.562
Facilitate improvements in the definition of the project's scope	3	5	4.18	0.528
Facilitate improvements in risk planning	3	5	4.25	0.518
Allow project personnel to better understand client requirements	3	5	4.39	0.562

In terms of the necessity of this Agile proficiency, 23.6% concurred, 69.8% strongly concurred, and 3.8% maintained a neutral stance, while 0.9% dissented, and 1.9% strongly dissented. A significant majority of the research participants (74.5%) strongly agreed that enhancing team skills within the waterfall project management framework can empower teams to identify and mitigate risks, thus expediting project delivery more effectively. Additionally, 73.6% strongly agreed that such an initiative could enhance the productivity and focus of project teams towards

achieving project goals. Similarly, akin to the incorporation of other Agile best practices, only a minority expressed disagreement or strong disagreement regarding the benefits that such integration could yield for teams in Process automation projects, particularly in mitigating issues that commonly lead to delays.

Solving Contractual Issues

The involvement of clients, contracts, consultants, and contracting processes significantly impacts the pace of project implementation, either expediting or delaying it. In numerous project management studies, such as this conducted by (Aramayo, 2013), contractual matters are identified as the primary hurdle to achieving faster project delivery. Within this project, the metrics gauging participants' reactions to proposed changes aimed at resolving contractual issues are presented in the table below. Across all items, there was a notable level of agreement, particularly evident in the item concerning the timely payment of contractors (M = 4.72, SD = .530).

Table 11: Descriptive Statistics (Solving Contractual Issues)

Item	Minimum	Maximum	Mean	SD
Timely payment of contractors	3	5	4.72	0.530
Setting and adhering to deadlines governing how new equipment is delivered	3	5	4.18	0.453
Setting and adhering to deadlines governing how quickly land acquisition issues are solved	3	5	4.20	0.446
Setting and adhering to deadlines governing how quickly decisions are made	3	5	4.10	0.477

Out of all participants, 73.1% concurred that ensuring timely payment to contractors could mitigate delays, with 23.1% expressing agreement, while only 7.7% strongly disagreed. Likewise, 77% and 11.5% agreed and strongly agreed, respectively, that resolving contractual issues could significantly contribute to the prompt 77% delivery of equipment, thereby directly influencing project expedience. A majority of respondents acknowledged that efficiently managing contracts could enhance teams' adherence to deadlines and positively influence the speed of project decision-making processes.

Answering Research Question 1

As outlined in the introduction and methodology sections, the survey-based quantitative research aimed to address the primary research question: "Which Agile Project Management best practices can be applied in the waterfall framework to reduce delays in process automation

projects?" Based on the study results, the majority of research participants concurred that several Agile best practices could enhance Process automation waterfall models to some extent, including: (1) iteration planning (Mean = 4.14, SD = .42), (2) retrospective meetings (Mean = 4.38, SD = .25), (3) daily stand-up meetings (Mean = 4.18, SD = .25), (4) communication and collaboration (Mean = 4.36, SD = .28), (5) enhancing team skills (Mean = 4.3, SD = .20), and (6) solving contractual issues (Mean = 4.3, SD = .20). When means are scaled to a range of 0–100 by dividing each mean value by the sum of all means, the best practices can be ranked in descending order: retrospective meetings (14.66%), communication and collaboration (14.59%), solving contractual issues (14.38%), enhancing team skills (14.39%), and iteration planning (13.83%).

These best practices exhibit relatively similar percentages, suggesting their equal importance in potentially reducing delays among process automation projects. Aligning with one of the four Agile Manifesto values, where "collaborating with customers is prioritized over contract negotiations," communication and collaboration appear to have a greater impact than resolving contractual issues, as per previous findings. The majority of participants (85.5%) concurred that prioritizing individuals and interactions over tools and processes could potentially diminish delays in delivering process automation projects.

In terms of specific best practices, 80.7% of participants agreed that iteration planning could enhance flexibility in waterfall projects. Additionally, a majority 77% agreed that retrospective meetings could facilitate frequent process adjustments in waterfall projects, while 73.1% strongly agreed on the importance of self-organizing teams for expediting project delivery. Conversely, 75% of participants believed that coordination among project teams could mitigate delays in the decision-making process. Moreover, a majority of research participants 74.5% strongly agreed that enhancing team skills in waterfall PM, and 71.7% agreed that ensuring timely payment to contractors could lead to reduced delays.

Respondents overwhelmingly recognized the significance of these best practices, viewing them as essential for expediting delivery, particularly in large and complex projects such as those in the Process automation sector. Furthermore, regarding project delays, respondents were asked to indicate their levels of agreement with a series of statements describing the potential for reducing project delays (see table below).

These items demonstrated a high level of internal consistency (Cronbach's alpha = .709); thus, they were aggregated and averaged to construct a dependent variable measuring control over project delays.

Table 12: Descriptive Statistics (Solving Project Delays)

Item	Minimum	Maximum	Mean	SD
Delays in the completion of projects are unavoidable	1	4	2.79	1.02
Delays in the completion of projects are caused by the approach to PM utilised	4	5	4.89	0.318
A different approach to PM could reduce delays in project completion	3	5	4.87	0.367
Delays in project completion are controllable	2	5	4.46	0.588

Prior to conducting an Ordinary Least Squares (OLS) regression analysis, an intercorrelation matrix encompassing all independent and dependent variables was generated (refer to Table 14). Several noteworthy observations emerged. Positive correlations were observed among all independent variables; nevertheless, the values did not indicate multicollinearity, as none surpassed a Pearson's coefficient of .7. This finding suggests that the variables assess distinct constructs and are not excessively interrelated, nor are they components of dissimilar constructs.

Table 13: Intercorrelation Matrix

	Reduction of delays	Retrospective meetings	Iteration planning	Daily project meetings	Communication & collaboration	Team skills	Solving contractual issues
Reduction of delays	1.00	0.263	0.263	0.368	0.483	0.275	0.297
Retrospective meetings	0.263	1.00	0.205	0.286	0.186	0.186	0.213
Iteration planning	0.239	0.263	1.00	0.372	0.371	0.476	0.482
Daily project meetings	0.368	0.286	0.372	1.00	0.184	0.441	0.454
Communication & Collaboration	0.483	0.186	0.371	0.184	1.00	0.319	0.331
Team skills	0.275	0.186	0.476	0.441	0.319	1.00	0.993

Solving contractual Issues	0.297	0.213	0.482	0.454	0.331	0.993	1.00

Moreover, the regression model depicted in Table below demonstrated significance, with a p-value of 0.00, F = 8.35, and df = 6. The R-squared value was determined to be .336, indicating that all variables collectively accounted for 33.6% of the variance in delay scores. Consequently, the findings from the intercorrelation matrix suggest that all APM best practices examined in this study exhibit positive correlations, with a reduction in project delays being most strongly associated with communication and collaboration (r = .483), followed by daily project meetings (r = .368) and resolving contractual issues (r = .297). Communication and collaboration are supported by (Conforto & Amaral, 2016) and (Aramayo, 2013), who assert that this practice influences project workflow. Similarly, daily project meetings are deemed essential by (Stray, Sjøberg, & Dybå, 2016) who argue that they enable early issue detection, thus saving time. Additionally, (Olaniran, Love, Edwards, Olatunji, & Matthews, 2015) have reported that 60% of projects encounter delays due to inadequate and untimely resolution of contractual issues.

Table 14: Regression Analysis

Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**Partial Correlation Coefficients**	**Sig.**
	B	S.Error	Beta		
(Constant)	-0.177	0.806		-0.105	0.827
Retrospective Meetings	0.128	0.121	0.093	-0.055	0.294
Iteration Planning	-0.45	0.082	-0,54	0.257	0.583
Daily project meetings	0.366	0.138	0.245	0.419	0.009
Communication and collaboration	0.517	0.113	0.415	-0.113	0.000
Team skills	-1.4	1.24	-0.793	0.118	0.261

Solving contractual issues	1.47	1.24	0.839	0.105	0.240

The results illustrated in the table above reveal a significant positive association between communication and collaboration and the mitigation of delays, whereas team skills show a negative correlation, albeit not statistically significant. Notably, daily project meetings make the most substantial contribution to delays (partial coefficient = .419), with a 95% confidence interval (lower bound = 0.74, upper bound = 0.93), followed by iteration planning (partial coefficient = 0.257).

The qualitative data presented in the subsequent section is anticipated to complement the quantitative findings, either reinforcing or refuting the hypotheses. This approach enhances research validity and triangulates data, addressing the limitations inherent in each method. As outlined in the methodology chapter, this study employed a sequential explanatory mixed-methods design, wherein the quantitative component played a central role in the investigation, while the qualitative component served to validate the data obtained from the quantitative methodology.

5.5 Qualitative analysis

This section describes the qualitative data collected during the eight interviews. A thematic analysis was employed to determine commonalities between responses.

Demographic profile of the interviewees

Table 15: Demographic Profile of the interviewees

Interviewee ID	Designation	Experience
A	Lead Project Engineer	9
B	Project Manager	14
C	Senior Project Manager	26
D	Project Engineer	5
E	Senior Project Engineer	7

Each of the five interviewees exhibited diverse levels of experience within the process automation sector and project management field. This spectrum ranged from individuals relatively new to the field, having recently studied the Agile framework, to seasoned veterans

with over 24 years of experience, who have witnessed the application of both frameworks within this sector.

Causes of delay in process automation projects

Below table presents the reasons provided by the interviewees when asked to identify, according to their experience, the causes of delays in projects in process automation sector.

Table 16: Causes on project delay in process automation sector.

Cause of project delay	Number of interviewees
Contractual problems	5
Communication issues between vendors	5
Poor planning	5
Poor HR planning	2
Labor compliance	2
Budget inaccuracies	2
Coordination	1
Neglect of quality control	1
Lack of differentiation between projects	1
Equipment failure	1
Missing data	1
Lack of feedback	1
Usage of traditional approaches	1
Lack of identification of skills	1

Table above presents the prevalent themes in the causes of project delays. The primary reason cited was contractual issues, followed by communication and collaboration, and poor planning. These issues are interconnected; therefore, resolving one may address others.

Interviewee A highlighted the poor interactions between vendors, especially during engineering and procurement stages, attributing delays to contract issues. Interviewee C expanded on the causes of delays in waterfall projects, mentioning the slow pace due to communication, coordination, planning deficiencies, and issues such as neglecting quality control and adopting a one-solution-fits-all approach. Interviewee E attributed delays to the prolonged process of contract drafting, agreement, and project implementation, leading to significant cost

implications. Similarly, Interviewee D emphasized the importance of proper planning, effective communication, and early contract management to ensure timely project execution in large and complex sectors like process automation.

Research Question 1 focused on identifying Agile Project Management (APM) best practices applicable within the Traditional Project Management framework to mitigate delays in process automation projects.

The APM best practices identified in the questionnaire surveys were further explored in the interviews, and Table below delineates the common themes of APM best practices in the process automation sector.

Table 17: APM Best Practices

APM Best Practices	Number of Interviewees
Retrospective meetings	4
Communication and collaboration	3
Daily stand-up meetings lasting only a few minutes or 15–20 minutes can be perceived as a waste of time.	3
Enhance team skills	3
Administration of contractual issues	3
Iteration planning	5

In the questionnaire survey, retrospective meetings, communication, and collaboration, as well as contractual skills were identified as essential best practices in Traditional Project Management (TPM) within process automation sector. Researchers have endorsed retrospective meetings as effective tools for addressing project delays. Additionally, communication and contractual skills have garnered support from various scholars as crucial factors influencing project deliveries. Therefore, the alignment of these practices with the perspectives of both survey respondents and interviewees in this study corroborates evidence from prior research.

Retrospective Meetings

Interviewee A said that looking back at their work during retrospective meetings, also known as sprint retrospectives, helped the team spot what went well and what could be better for the next sprint. They mentioned that sprints are short stages with specific time limits, acting as checkpoints in their work schedule. If they don't finish a sprint, they can't move on to the next milestone.

Interviewee B agreed, saying that these meetings give the team a chance to make improvements and think about what worked and what didn't in the past. They stressed that by learning from mistakes, the team can avoid delays and work more efficiently.

Interviewee C added that while planning ahead is important, reflecting on past achievements and figuring out how to do better is equally crucial.

Interviewee D supported the idea, saying that by continuously looking for ways to improve, the team can deliver projects faster and with better quality.

According to (Matthies, 2019), retrospective meetings play a crucial role in project management. (Drury-Grogan, 2014) further emphasizes that retrospective meetings and iteration planning complement each other, working together to develop functionality and ensure quality delivery.

Communication and Collaboration

Interviewee A emphasized the importance of communication and collaboration in project success, particularly in process automation projects. They noted that relying solely on written communication, especially at the project's onset, can lead to failures or delays. They highlighted the value Agile methodologies bring to project management, especially through improved communication facilitated by stand-up and retrospective meetings.

Interviewee B further underscored the significance of communication and collaboration in the process automation sector, particularly in complex projects like process automation. They believed that incorporating Agile practices into traditional waterfall frameworks can expedite the delivery of large projects by enabling teams to foresee and address issues. However, they expressed skepticism about the effectiveness of daily stand-up meetings in such environments due to their potential for becoming tedious and irrelevant.

Interviewee C emphasized the universal importance of communication and collaboration, particularly in process automation projects, where teamwork and coordination are crucial. They highlighted that effective communication not only fosters teamwork but also helps in explaining project details and progress to external stakeholders.

In the related literature, (Sharp & Robinson, 2010) Alt-Simmons (2015), and (Demir, 2016) have all emphasized the importance of communication in keeping project teams aligned, resulting in faster project delivery, fewer errors, and higher quality outcomes.

To conclude, like retrospective meetings, effective communication and collaboration emerged as crucial practices for enhancing the efficiency of process automation projects.

Daily Stand-Up Meetings

Interviewee C shared similar concerns with Interviewee B about the time spent in daily stand-up meetings but acknowledged their importance for efficient project management. They suggested that these meetings should be brief to prevent delays, serving as a way for everyone to share their progress and daily goals before starting work.

On the other hand, Interviewee F viewed daily stand-up meetings positively, seeing them as opportunities to unite the team and ensure everyone is aligned with the project's objectives. They believed that this shared focus ultimately enhances project delivery speed.

(McHugh, Conboy, & Lang, 2012) underline the significance of daily stand-up meetings in fostering team cohesion, enabling focus on project progress, and fostering a shared understanding among team members.

Enhancing Team Skills

Interviewee A stressed the importance of having the right skills within the team, ensuring that each person is assigned tasks they excel at.

Interviewee E highlighted that a project's success hinges on the skills and abilities of its team members, emphasizing the need to identify and improve these skills for effective delegation and project completion.

Interviewee D pointed out that having skilled individuals is crucial for project success, as working with under-skilled team members can lead to delays and even project failure. They emphasized the importance of matching people with the right skills to their tasks, which can speed up project delivery and improve quality.

In summary, all interviewees emphasized the critical role of team skills in project success. They suggested that project managers should carefully select team members whose skills align with project requirements to avoid delays caused by resource shortages or the need for additional training.

Iteration Planning

All interviewees agreed that iteration planning is a crucial method in project management. Interviewee A explained that it helps everyone understand what needs to be done, how complex it is, and who is responsible for what. Interviewee B linked iteration planning to thorough planning, considering risks, objectives, and realistic goals. Interviewee C added that it helps the

team focus on specific targets, which speeds up task completion and the overall project. Interviewee E mentioned that iteration planning improves delegation by prioritizing tasks and keeping the project on schedule.

(Serrador & Pinto, 2015) agree that iteration planning brings flexibility and resilience to manage complex projects. It allows project managers to reassess needs and deliver optimal quality without slowing down the project.

Administration of Contractual Issues

Interviewee B stressed the crucial importance of tackling contractual issues early in project management. They emphasized that in a demanding work environment, any hiccups in contract management could not only delay project delivery but also harm productivity and revenue. Interviewee E echoed this sentiment, emphasizing the need to address all project management aspects early on to avoid any contractual loopholes that could cause delays, especially considering the complexities of process automation projects.

Interviewee D strongly advocated for resolving contractual issues promptly, highlighting the essential role of timely resource allocation in meeting project deadlines. They emphasized that addressing contract-related issues well in advance is essential for meeting project timelines. The findings indicate that project managers placed significant emphasis on managing contractual issues, considering it a best practice. Among all the best practices examined, addressing contractual issues stood out as particularly crucial. Without resolving these issues, projects would be unable to progress. Failure to address contractual issues hinders project progress, leading to delays and increased complexity. Table below provides a summary of interviewee opinions on Research Question1.

Table 18: Summary of interviewee Opinions on Research Question 1 (APM Best Practices)

	Interviewee				
Code	A	B	C	D	E
Years of Experience	9	14	26	5	7
Iteration planning		*	*		*
Retrospective meetings	*	*	*	*	*
Communication and collaboration	*	*	*		*
Daily stand-up meetings (15-20)		*	*	*	

Daily Stand-up meetings (Waste time)		*	*	*	
Enhancing team skills	*				*
Administration of contractual issues		*			*

Research Question 2: How can Agile Project Management enablers and best practices be applied in the Traditional Project Management framework in process automation?

Table 19: Enablers of APM

Enablers of APM	Number of Interviewees
Defining Agile best practices well	3
Applying the best practices to a traditional framework	3
Identifying weak areas and implementing best practices	5
Reporting, communication, and collaboration	4
Iteration planning	2
Flexibility and adaptability	3
Risk mitigation	1
Team focus	2

Interviewees identified several factors that enable Agile Project Management (APM), as outlined in the table above.

Interviewee A expressed their viewpoint as follows:

"I think it's crucial to define what we mean by 'Agile best practices.' To me, these include meetings, forward planning, simple design, effective communication, continuous integration, and customer collaboration. Among these, iteration planning stands out as particularly important in Agile Project Management (APM). It ensures that the project manager, client, and team are aligned on the expected deliverables, project complexity, and individual responsibilities."

Interviewee A believed that iteration planning helped establish a common rhythm and set clear boundaries for work. Interviewee B compared integrating Agile best practices into traditional project management to adding elements like retrospective meetings, communication, and collaboration into a waterfall model. Interviewee C suggested incorporating Agile practices such

as communication and collaboration into the waterfall framework, alongside functional specifications, and well-documented requirements. Interviewee E saw the value in Agile practices for faster and cost-effective delivery in process automation projects.

To implement Agile best practices, Interviewee A suggested incorporating practices like meetings, planning ahead, simple design, communication, continuous integration, and customer collaboration into traditional project management. Interviewee B recommended integrating Agile elements that could enhance waterfall design. Interviewee C proposed a hybrid framework combining Agile and waterfall practices, emphasizing the importance of blending the strengths of both methodologies. Interviewee E emphasized the importance of experience and skills in integrating Agile practices into projects.

Interviewee D supported a hybrid framework, emphasizing the benefits of adding Agile features like iterative planning and retrospective meetings to improve project management. However, they cautioned against potential confusion when integrating too many Agile features into the waterfall framework. Interviewee E stressed the need for skill and experience in integrating Agile best practices, warning against poor integration that could lead to project failures.

Interviewee D highlighted how an Agile approach could enhance project delivery by fostering team collaboration and focus. (Cooper, 2016) supported the implementation of hybrid frameworks to achieve complex project goals, emphasizing the importance of coordination and communication. Several interviewees noted that Agile hybrid models could mitigate risks by being flexible and adaptable.

Despite agreement on Agile best practices, interviewees found implementing them in a hybrid model challenging, particularly in complex process automation projects. Unlike IT projects, where project management methodologies are approved by project management offices, guidelines for implementing hybrid models in process automation projects remain uncertain.

Table below summarizes interviewee responses to Research Question 2.

Table 20: Summary of interviewee Responses to Research Question 2 (Enablers of APM)

	Interviewee				
Code	A	B	C	D	E
Years of Experience	9	14	26	5	7
Defining Agile best practices well	*	*	*		

Applying the best practices to a traditional framework	*	*	*		
Identifying weak areas and implementing best practices	*	*	*	*	*
Reporting, communication, and collaboration	*	*	*		*
Iteration planning	*			*	
Flexibility and adaptability	*	*	*		
Risk mitigation	*				
Team focus				*	*

Research Question 3: How can a Hybrid Project Management framework (Traditional/Agile) address project complexity to reduce delays in process automation projects?

Agile Project Management and Project Complexity

Some interviewees discussed how Agile Project Management (APM) can tackle project complexity. The table below shows that APM's iterative approach, its primary and most widespread characteristic, can effectively reduce project complexity. Interviewees often highlighted the flexible and adaptable nature of APM, along with its related features like communication and responsiveness.

APM Features to Address Project Complexity	Description	Number of Interviewees
Phase-wise implementation or iterative implementation	Breaking projects into phases or implementing them iteratively can help minimize project delays.	
Flexibility and adaptability	The project methodology aimed at providing flexibility in timing and adaptability to change.	
Communication and collaboration	Enhancing communication and collaboration among team members has the potential to decrease conflicts and enhance project outcomes.	

Responsiveness	Project management that allows the team to respond to changes directly is advisable.	
Risk mitigation	All risks must be identified and mitigated before they become an issue.	
Modernistic approach	A modern PM method takes into consideration the complexity of current projects.	
Priority of client feedback	Early client feedback allows projects to retrofit potential errors early.	
Smart working	PM that allows managers to follow their project smartly is advisable.	

Interviewee B provided a clear definition of Agile Project Management (APM), describing it as the execution of projects in iterative stages to ensure task completion before progressing to the next stage. They emphasized that this approach fosters collaboration, valuing communication over rigid processes.

Interviewee C believed that Agile Project Management could streamline process automation projects by utilizing iteration planning to realistically plan ahead. This, they suggested, enables the team to focus on specific targets, expediting task completion and overall project delivery. They also noted that applying Agile best practices to a waterfall model helps address complexity and delays inherent in projects.

Interviewee E echoed this sentiment, emphasizing the importance of iteration in team planning for seamless delegation and ensuring project schedules are maintained. They advocated for hybrid methodologies, which blend the strengths of different management models to improve operational fluidity and address project dynamics effectively.

Interviewee D emphasized the strategic and smart aspects of APM, particularly in process automation projects, where hybrid methods allow for early agreement on deliverables, enhancing both quality and delivery time.

The literature supports the adoption of hybrid frameworks in addressing project complexity, as traditional frameworks may struggle to cope with environmental challenges. Scholars such as (Conforto & Amaral, 2016) provide evidence suggesting that traditional project management (TPM) frameworks are insufficient for modern projects' flexibility demands.

5.6 Summary

This chapter presents the outcomes of the quantitative survey, beginning with the results of the reliability analysis, which affirmed the instrument's reliability. The analysis of individual items revealed key practices beneficial for addressing project delays and complexity in process automation sector. Additionally, insights from the interview schedule have been discussed, alongside identified common themes, providing richer detail on Agile Project Management (APM) best practices.

Consequently, the chapter identifies APM best practices applicable to Traditional Project Management (TPM) for mitigating delays in process automation projects: retrospective meetings, communication and collaboration, daily stand-up meetings, enhancing team skills, and managing contractual issues. Furthermore, it underscores the key enablers of APM for process automation projects, including defining and applying Agile best practices, effective reporting and communications, and maintaining focus on specific project deliverables.

Chapter 6: Discussion & Conclusion

6.1 Chapter Overview

This chapter presents the findings of this study as they relate to the research questions. The demographic details of the sample are described to understand the type of people who answered the survey questionnaire and participated in the semi-structured interviews. The opinions of the survey respondents regarding Agile values are discussed first. The results indicate that the respondents agreed with all values, with a percentage mean of 85.6%.

The first research question, which explored the causes of project delays, is answered utilizing the results from the survey and the interviews. The chapter discusses findings related to iteration planning, retrospective and daily stand-up meetings, communication, and collaboration, enhancing team skills, and solving contractual issues. All are identified as best practices that have significant relationships with the reduction of project delays. Another topic of discussion is the facilitators for applying a hybrid framework, which identifies the best practices from APM to analyze the weak areas of the traditional framework and directly apply the required best practices. The hybrid framework model is also suggested, which can reduce project delays and address project complexity by adding the APM best practices to the waterfall PM framework.

6.2 Best Practice of APM (Answer to Research Question 1)

in addition to the analysis presented in chapter 5, this chapter explores how the research question was addressed. The study aimed to evaluate the shortcomings of the existing traditional project management (TPM) framework in the process automation sector, leading to project delays, and to determine if transitioning to more Agile methods and techniques could resolve these issues. This chapter concludes by discussing the study's findings in the context of existing literature and theory, synthesizing insights from both quantitative and qualitative methods.

Beginning with the demographic and project-related data collected from the 26 survey participants, it's evident that the sample comprised professionals from various roles associated with project management (PM) in the process automation sector. This diverse representation included engineers, coordinators, planners, and project and program managers.

Participants had diverse levels of experience, ranging from zero to over 15 years, and all were working in organizations employing traditional PM frameworks, with a majority using customized traditional frameworks. None of the participants had APM implemented in their

organizations, making their insights valuable in understanding the causes of delays and their potential relationship with APM practices.

Interviewees, representing various PM roles and experience levels, were associated with the process automation sector and had experience with both TPM and APM frameworks. A Multivariate Analysis of Variance (MANOVA) test revealed that the type of PM framework significantly correlated with project delays, with PMI projects experiencing more delays than other frameworks. However, given the limited representation of PMI and PRINCE2 frameworks in the sample, caution is advised in generalizing this relationship.

During interviews, participants identified several factors contributing to project delays, including contractual issues, communication gaps with vendors, poor planning, HR challenges, budgeting issues, quality control, equipment maintenance, and data management. Contractual issues and communication gaps emerged as primary contributors to delays, with these problems often intertwined with other identified causes. The chosen APM practices were seen as potential solutions to address multiple bottlenecks simultaneously.

Results from the questionnaire revealed that respondents agreed with Agile values, indicating recognition of the importance of Agile principles in improving project outcomes. Notably, values emphasizing collaboration with customers during contract negotiations, prioritizing human relationships over processes, and focusing on working software over documentation resonated strongly with respondents, underlining the perceived relevance of Agile values in their projects.

Iteration Planning

The results emphasize the importance of specific Agile Project Management (APM) practices and techniques. Iteration planning, highlighted by both survey respondents and interviewees, was universally recognized as beneficial. Interviewee B defined APM as a method that executes projects in iterative stages, promoting collaboration and valuing communication over rigid processes.

Survey responses showed a strong agreement on the usefulness of iteration planning, with 87.7% of respondents either agreeing or strongly agreeing on its benefits for increasing project flexibility. The highest levels of agreement were observed regarding the improvement of planning and scheduling, better risk management, and faster incorporation of changes, leading to reduced delays. Iteration planning was significantly correlated with all other variables, particularly with solving contractual issues and team skills.

Qualitative analysis revealed common themes from interviewees, including the enhancement of planning, team cohesion, focus on specific targets, improved task delegation, simplified progress tracking through iterative milestones, and better risk identification and mitigation. Figure below illustrates these common themes for iteration planning and its integration into project management practices.

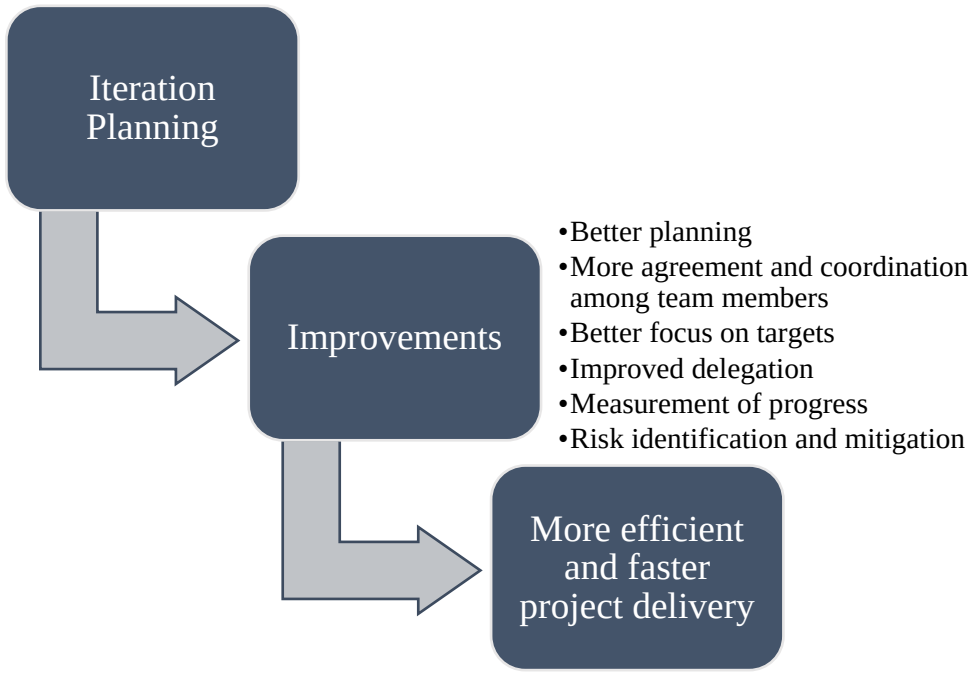

Figure 4: Iteration Planning and Project Management (Created by the Researcher).

The results from both surveys and interviews align with scholarly arguments emphasizing the significance of iteration planning in project management (PM). Scholars highlight iteration planning's role in determining the features and functionalities for the next project phase, aiding in risk reduction and error prevention. (Serrador & Pinto, 2015) stress the importance of integrating iteration planning as an Agile best practice, enabling timely feedback and focused delivery, essential for project success. Similarly, (Conforto & Amaral, 2016) emphasize iteration planning's ability to facilitate project reconfiguration and meet client needs efficiently.

In summary, the survey, interview findings, and existing literature support the effectiveness of introducing iteration planning to a traditional project management (TPM) model, particularly in the process automation sector. This integration can lead to faster project delivery. Therefore, Hypothesis 1, which posits that introducing Agile iteration planning in a TPM framework can reduce project delays, is proved.

Retrospective meetings

Retrospective meetings are highly valued in Agile project management (APM) and are seen as beneficial for traditional waterfall frameworks too. The survey showed that adapting to changes and involving clients in planning received the highest ratings, indicating their importance. Other aspects like risk management and flexibility were also rated highly. The survey results revealed that retrospective meetings were significantly linked to various project aspects, especially daily project meetings and preventing delays.

In interviews, all eight participants agreed on the importance of retrospective meetings in reducing project delays. They believed that these meetings offered opportunities to review project progress, improve planning, prevent errors, and address risks, leading to more efficient project delivery. These findings are summarized in the figure below.

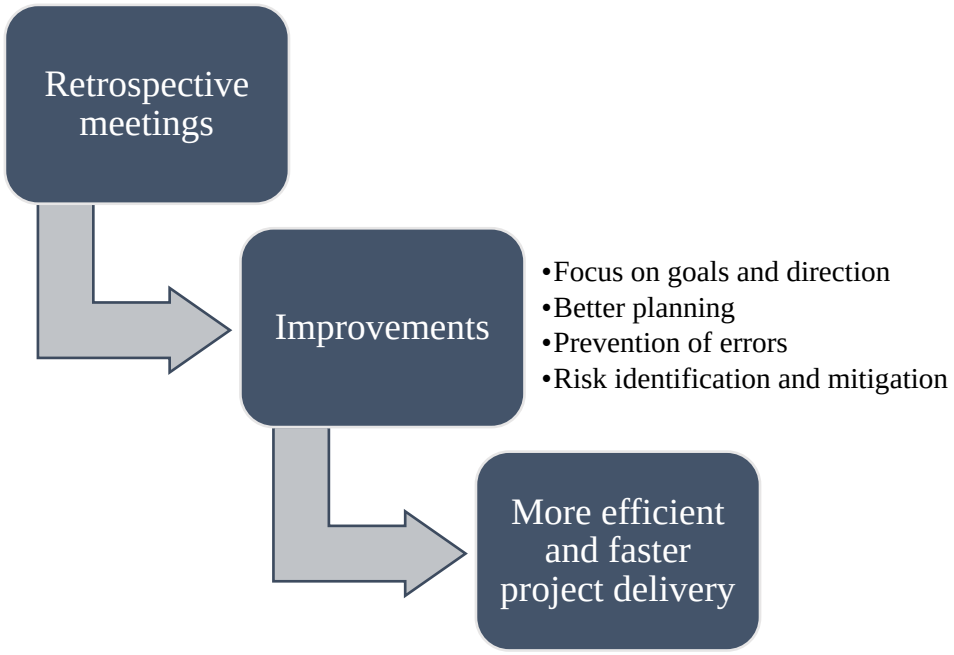

Figure 5:Retrospective Meetings and Project Management (Created by the Researcher)

Improving project planning and allowing for frequent process adjustments can help solve risks and prevent delays in projects, especially in the process automation sector. This finding aligns with the views of many experts who advocate for the inclusion of retrospective meetings, an Agile best practice, to expedite project delivery. These meetings, as highlighted by various scholars, are essential for enhancing project quality, team satisfaction, and schedule management. They promote the concept of 'inspect and adapt,' focusing on improving processes quickly to meet project goals and improve product quality. (Andriyani, 2017) and (Conforto &

Amaral, 2016) emphasize the importance of these meetings in facilitating team adaptability and improving project delivery overall. Thus, the results from both the survey and interviews support the idea that integrating Agile retrospective meetings into a traditional project management framework can indeed reduce project delays.

Daily standup meetings

The survey results showed that while nearly half of the participants were uncertain about the benefits of integrating daily stand-up meetings, those who agreed or strongly agreed with their usefulness outnumbered those who disagreed. In the qualitative interviews, three out of six interviewees emphasized the importance of daily stand-up meetings in Agile project management. However, some interviewees cautioned against extending these meetings beyond a short duration, with two participants considering them a waste of time. The desirable features of Agile project management identified by the interviewees, such as responsiveness, flexibility, and adaptability, necessitate the implementation of daily stand-up meetings.

Correlation analysis revealed that daily stand-up meetings were significantly related to all other variables, with contractual administration and team skills showing the strongest influence. Interviewee E supported the use of daily stand-up meetings, highlighting their importance in coordinating complex projects like those in the process automation sector. However, concerns were raised by some interviewees regarding the potential waste of time and effort associated with these meetings, suggesting that they should be kept short.

These findings align with previous research, which emphasizes the importance of daily stand-up meetings in facilitating communication, coordination, and problem-solving within project teams. Scholars argue that these meetings contribute to team cohesion, improved project delivery, and early issue resolution. Based on the survey, interview, and existing literature, it can be concluded that integrating daily stand-up meetings into traditional project management frameworks can indeed lead to faster delivery of process automation projects.

Communication and collaboration

Communication and collaboration emerged as the most influential factor in reducing project delays, as indicated by both the regression analysis and individual survey responses. The survey item related to the impact of communication and collaboration on decision-making received the highest rating, indicating its significance in this regard.

In the regression analysis, communication and collaboration showed the strongest association with the reduction of project delays, followed by iteration planning. These relationships were found to be significant. Additionally, four interviewees cited communication issues as a major cause of project delays, highlighting poor interactions between vendors and a lack of feedback and coordination.

The interviewees unanimously agreed on the importance of communication and collaboration in project management, emphasizing their role in improving project deliveries and minimizing delays. Common themes identified included promoting teamwork, facilitating quicker and more frequent communication, involving stakeholders, and addressing bottlenecks. Moreover, the relationship between retrospective meetings and iteration planning with communication and collaboration was also noted by the interviewees.

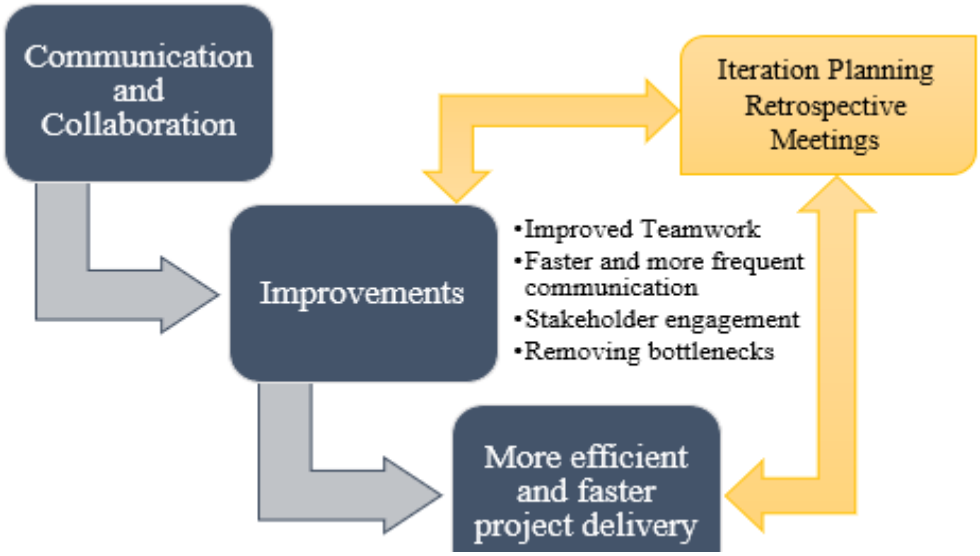

Figure 6: Communication and Collaboration and Project Management (Created by the Researcher)

Numerous studies emphasize the critical role of communication and collaboration in Agile project management. Scholars like (Conforto & Amaral, 2016) highlight the importance of continuous team feedback and collaboration, which are often lacking in traditional project management (TPM) approaches. Without these elements, there is a higher risk of errors, delays, and even project failure due to poor change management and decision-making quality.

Similarly, Other scholars argue that effective communication and collaboration empower team members to address complex project issues promptly, reducing indecision and expediting project delivery. Coordination is particularly crucial in large project teams, as highlighted by (Sharp &

Robinson, 2010). (Demir, 2016) also support this notion, stating that coordinated efforts and effective communication enable teams to work more efficiently and with fewer errors.

Based on the findings of this study and previous research, it is evident that integrating effective communication, feedback mechanisms, and collaboration can lead to expedited project delivery in process automation projects. Therefore, Hypothesis 4, which suggests that introducing Agile communication and collaboration practices in a TPM framework can mitigate project delays, is supported by the evidence.

Enhancing Team Skills

All components within the team skills scale garnered notable agreement from survey respondents. Each item received ratings surpassing a mean value of 4, with those focusing on fostering interaction, support, and enhancing productivity and focus of team members obtaining the highest ratings, averaging at 4.39. As anticipated, these factors displayed significant correlations with all other variables, particularly demonstrating strong predictability with solving contractual issues ($r = .993$) and iteration planning ($r = .476$).

In the qualitative analysis, several human resource (HR) challenges were identified as contributing to project delays. These ranged from inadequate HR planning, resulting in mismatches between personnel skills and project requirements, to ineffective coordination and difficulties in identifying team members' competencies.

Among interviewees, two out of five highlighted the significance of team skills within Agile Project Management (APM). Common themes emerging from discussions on team skills included the importance of selecting suitable team members, aligning tasks with individual proficiencies, enhancing communication and collaboration, and effectively delegating responsibilities. Most responses emphasized the detrimental impact of selecting inappropriate team members, underscoring the potential for project delays arising from skill mismatches and diminished teamwork efficiency. These recurrent themes are visually depicted in the accompanying figure.

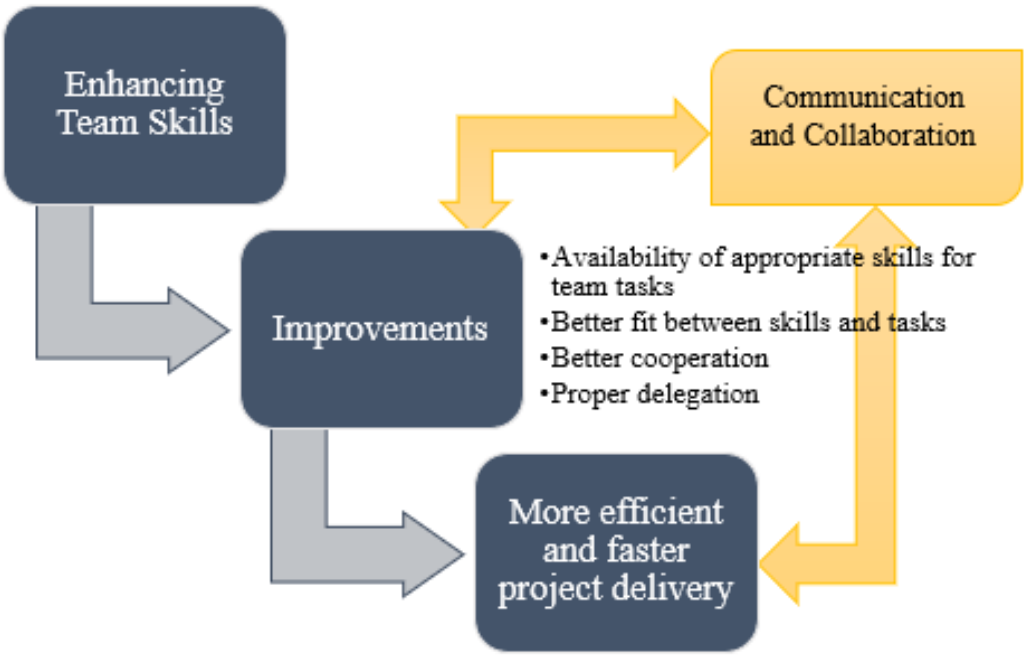

Figure 7: Enhancing Team Skills and Project Management (Created by the Researcher)

These findings align with existing research emphasizing the significance of team skills within Agile projects for achieving project objectives. For example, (Moe, Dingsøyr, & Dybå, 2010) argue that Agile teams outperform those using Traditional Project Management (TPM) by prioritizing the identification and improvement of skills, leading to enhanced productivity and expedited delivery of high-quality products meeting customer expectations consistently. (Aniche & Azevedo) suggest that Agile teams demonstrate greater productivity and efficiency in delivering quality outcomes due to their proactive pursuit of new knowledge. Similarly, (Shaye, 2008) highlights that proficient teams execute projects more swiftly and effectively when equipped with the necessary skills for delegated tasks. (Tsoy & Staples, 2020)emphasize the importance of effective team management, stating that investing in team skill development enhances the likelihood of project success, even amidst the challenges posed by complex projects. Thus, the amalgamation of quantitative and qualitative findings, alongside existing literature, strengthens the support for Hypothesis 5: Enhancing team skills within a TPM framework can mitigate project delays.

Solving Contractual Issues

The survey findings revealed a strong consensus on the importance of addressing contractual issues in project management, particularly due to their association with project delays. All survey

items related to this variable scored above a mean value of 4, indicating its significance. Additionally, solving contractual issues showed significant correlations with other variables, notably team skills (r = .993) and iteration planning (r = .482), suggesting their predictive power. Interviewee A encapsulated the sentiments of others, highlighting the detrimental impact of poor vendor interactions and contractual issues on project execution timelines. Thematic analysis of qualitative interview data further underscored contractual issues as a primary cause of project delays. Moreover, this variable was found to be intertwined with communication and collaboration, iteration planning, retrospective and daily stand-up meetings, and team skills, all contributing to resolving contractual challenges.

(Olaniran, Love, Edwards, Olatunji, & Matthews, 2015) assert that a considerable portion of large projects grapple with delays and failures stemming from unaddressed contractual issues, often resulting in cost overruns and missed deadlines.

In light of the evidence from the quantitative survey, interviews, and literature review, Hypothesis 6 is supported.

6.3 Facilitators for the Application of a Hybrid Project Management Framework (Answer to Research Question 2)

The integration of Agile Project Management (APM) best practices into the traditional project framework reveals insights into the hybrid framework needed for process automation projects. Thematic analysis of interviews highlights concerns about the expertise of project managers tasked with implementing the hybrid approach. Some interviewees advocate for a phased implementation, starting with pilot projects, to avoid additional delays. Identifying facilitators that streamline hybrid framework implementation in process automation projects is therefore critical.

Interviewees emphasize defining APM best practices clearly for universal understanding among team members. They suggest integrating selected Agile elements into the traditional framework to enhance its effectiveness. This entails incorporating practices like communication and collaboration into existing waterfall models, alongside functional and technical specifications. Exploring weak areas in the current framework and addressing them with Agile practices is also recommended.

Key facilitators for hybrid methodology implementation include selecting and directly applying best practices like communication, iteration, flexibility, and risk mitigation. Clear definition of these practices is vital to ensure the hybrid model's efficiency in project management.
Support for hybrid frameworks is echoed by (Cooper, 2016), who underscores their ability to combine the strengths of traditional and Agile approaches. Visual tools are proposed as aids for prioritization, management, and adaptation to change within the hybrid model. (Conforto & Amaral, 2016) emphasize the importance of recognizing environmental changes and suggest enablers across project type, team, process, and organization categories to enhance the application of hybrid frameworks in process automation projects.

Table 21: Organisational Facilitators for Process Automation Projects' Implementation of a Hybrid Framework (Adapted from (Conforto E. , 2014))

Organisation	Description
Organisational Culture	The top management, current policies, and practices need to align with the hybrid framework.
Acceptance of Agile Methodology	Project managers and team members need to acknowledge the necessity of a hybrid framework and reach an agreement on its implementation strategy.
Adequate Reward	Provide recognition and rewards to all team members for their initiative and support in implementing the hybrid framework.
Performance Measurements	Acknowledging and rewarding team members' performances is essential. However, interviewees noted that current performance measures in their existing project management frameworks are inadequate.
Learning Organisation	Interviewees pointed out that many teams experience delays or failures due to a lack of necessary skills among team members.

Decentralised Decision-Making	Team leaders should promote delegation and decentralization to empower all members with the authority needed to fulfill their responsibilities. This delegation will not only foster communication and collaboration but also enhance team skills, both of which are critical Agile Project Management (APM) best practices identified in this study.

Table 22: Process Facilitators for Process Automation Projects' Implementation of a Hybrid Framework (Adapted from (Conforto E. , 2014))

Process	Description
Possibility to Reconfigure	It is essential for project managers to have the competence and experience to adapt the framework or best practices if they fail to meet expectations. This was highlighted as a significant concern by interviewees, who expressed doubts about the capability of existing project managers to effectively manage a hybrid framework.
Process Modularity	The interviewees in this study recommended that project managers adopt a gradual approach when implementing a hybrid framework.
Easy Access to Information	Project managers should facilitate easy access to information to foster knowledge sharing and improve teamwork skills. Additionally, delegating decision-making authority, promoting communication and collaboration, and iterating rely on the open exchange of information among project teams.

Frequent Development Milestones	Retrospective meetings, daily stand-up meetings, communication and collaboration, and performance measurements are linked to progress assessments through regular milestone evaluations.
External Integration	All Agile best practices identified in this study should be integrated into the traditional waterfall methodology while considering and aligning with external conditions.

Table 23: Project Team's Facilitators for Process Automation Projects' Implementation of a Hybrid Framework (Adapted from (Conforto E. , 2014))

Project Team	Description
Self-Directed Teams	All Agile best practices presuppose the necessity of a team that possesses the required knowledge, skills, attitude, and resources.
Team Leadership	Effective decentralization of authority, knowledge sharing, iterative planning, and enhancement of team skills necessitate the expertise and experience of project leadership.
Team Knowledge Regarding a Hybrid Framework	The identified best practices should be formally shared with team members through a structured mechanism to ensure their acceptance and agreement with the implementation. If any team member is not comfortable or remains doubtful about a best practice, discussions should be held until the team reaches a consensus.
Team and Project Leader Experience	As team members and leaders gain more experience with a hybrid framework and

	APM best practices, the implementation process will improve, leading to a reduction in project delays over time. It's important to encourage experienced teams to share their expertise with others who are just starting the process.
Multidisciplinary Teams	Multidisciplinary teams are better equipped to handle a hybrid framework due to their diverse skill sets. However, effective communication is crucial for successful collaboration. Project leaders play a key role in steering their teams to overcome communication barriers and ensure effective collaboration.

Table 24: Project Type's Facilitators for Process Automation Projects' Implementation of a Hybrid Framework (Adapted from (Conforto E. , 2014))

Project Type	Description
Succession Planning	Succession planning is crucial for forming effective teams. Without it, teams may lack the necessary skills, leading to project setbacks.
Required Project Pace	Projects with an urgent pace benefit from daily stand-up meetings, quick communication, a skilled team, and efficient resolution of contractual issues. On the other hand, projects with a more relaxed pace, where quality cannot be compromised, benefit from retrospective meetings, iterative planning, and collaboration.

Goal Clarity	Iterative planning, daily stand-up meetings, and effective communication and collaboration are essential for achieving goal clarity. These practices ensure that all team members remain synchronized and focused on the project objectives.
Project Complexity	Complex projects necessitate careful analysis to determine whether they would be better suited to the familiarity and standardization of the waterfall methodology or the adaptability and responsiveness of the hybrid framework.
Customer Involvement	Increased customer involvement in a project correlates with a greater need for communication and responsiveness.
Project Newness	In new projects, increased communication through meetings and closer milestone inspection is beneficial. As time progresses, team and system maturity align with project requirements, leading to a shift in focus towards retrospective meetings, contractual issue resolution, and collaboration.

The tables above outline key factors identified in this study and from existing research that contribute to project success. For example, if a project faces frequent changes in customer demands, practices like daily meetings, iterative planning, addressing contract issues, and strong communication become crucial. With global customers becoming more demanding, Agile methods, which prioritize customer feedback, are increasingly necessary. For instance, the recent COVID-19 pandemic has disrupted the most of industries, affecting project timelines, emphasizing the need for flexible planning.

A well-prepared team is vital for effective decision-making in their respective roles, supported by top management and project leaders who empower them to work autonomously. Implementing a hybrid approach gradually, either by focusing on one best practice or

incorporating all into one project, allows for assessment and adjustments. Encouraging a culture of sharing knowledge and continuous learning ensures teams have the skills and knowledge needed to meet customer demands.

Project leaders play a critical role in integrating identified best practices into existing frameworks, ensuring adaptability and responsiveness. Daily meetings, retrospectives, and iterative planning require skilled leadership to avoid project delays. For example, lengthy daily meetings can hinder progress, but effective leadership can keep them focused and brief.

Agile methodology emphasizes responsiveness to environmental changes and customer needs, facilitating faster delivery and incorporation of feedback. A skilled leader can ensure daily meetings are efficient and focused on facts. Overall, the hybrid framework must be implemented comprehensively, with all best practices integrated to achieve its objectives of reducing project delays. Each practice supports the others, forming an interconnected model for success.

6.4 Facilitators Hybrid Project Management Framework and Project Complexity (Answer to Research Question 3)

The study emphasizes the importance of integrating Agile Project Management (APM) practices into the traditional Project Management (TPM) framework to effectively manage complexity in process automation projects. Interview responses highlighted the need for a phased approach to project implementation, breaking down complex projects into manageable milestones. This iterative process, characteristic of APM, enhances responsiveness and effectiveness in addressing ever-changing customer demands.

Existing literature supports this approach, indicating that APM's focus on simplicity and iterative planning is well-suited for managing project complexity. Flexibility and adaptability, core features of APM, were highlighted by interviewees as essential for addressing project complexity effectively. Additionally, communication and collaboration emerged as critical for controlling project complexity by addressing issues early and continuously.

Experts emphasized the importance of a responsive approach, risk mitigation, and prioritizing client feedback within the hybrid framework. The study underscores that integrating APM practices with TPM not only reduces project delays but also effectively manages project complexity, crucial in the dynamic process automation sector.

Scholarly sources further support the need for Agile values such as responsiveness and resilience to navigate the complexities of the industry. Key factors for successful implementation include

management competence, employee skills, and organizational culture, all of which mediate the impact of complexity in process automation projects.

The proposed hybrid framework in below figure aims to leverage identified best practices to achieve faster, more efficient project delivery and improved quality.

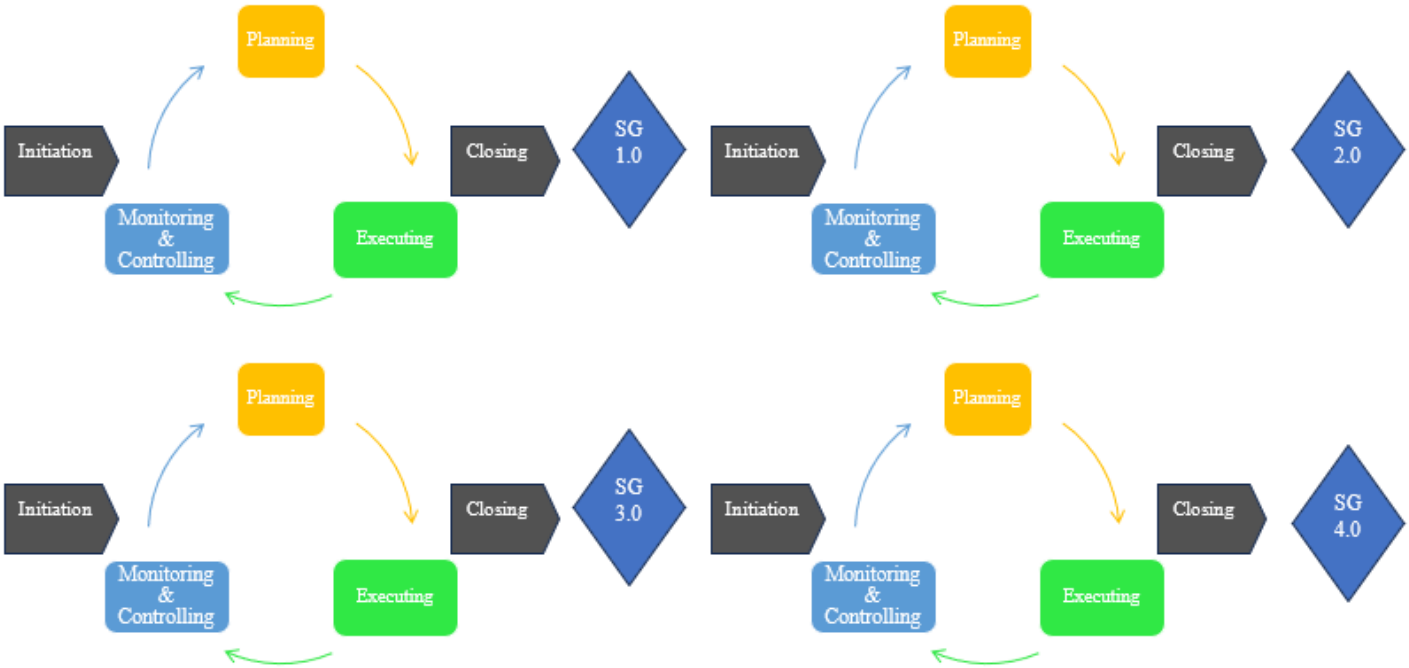

Figure 8: Waterfall project management lifecycle (Created by the researcher)

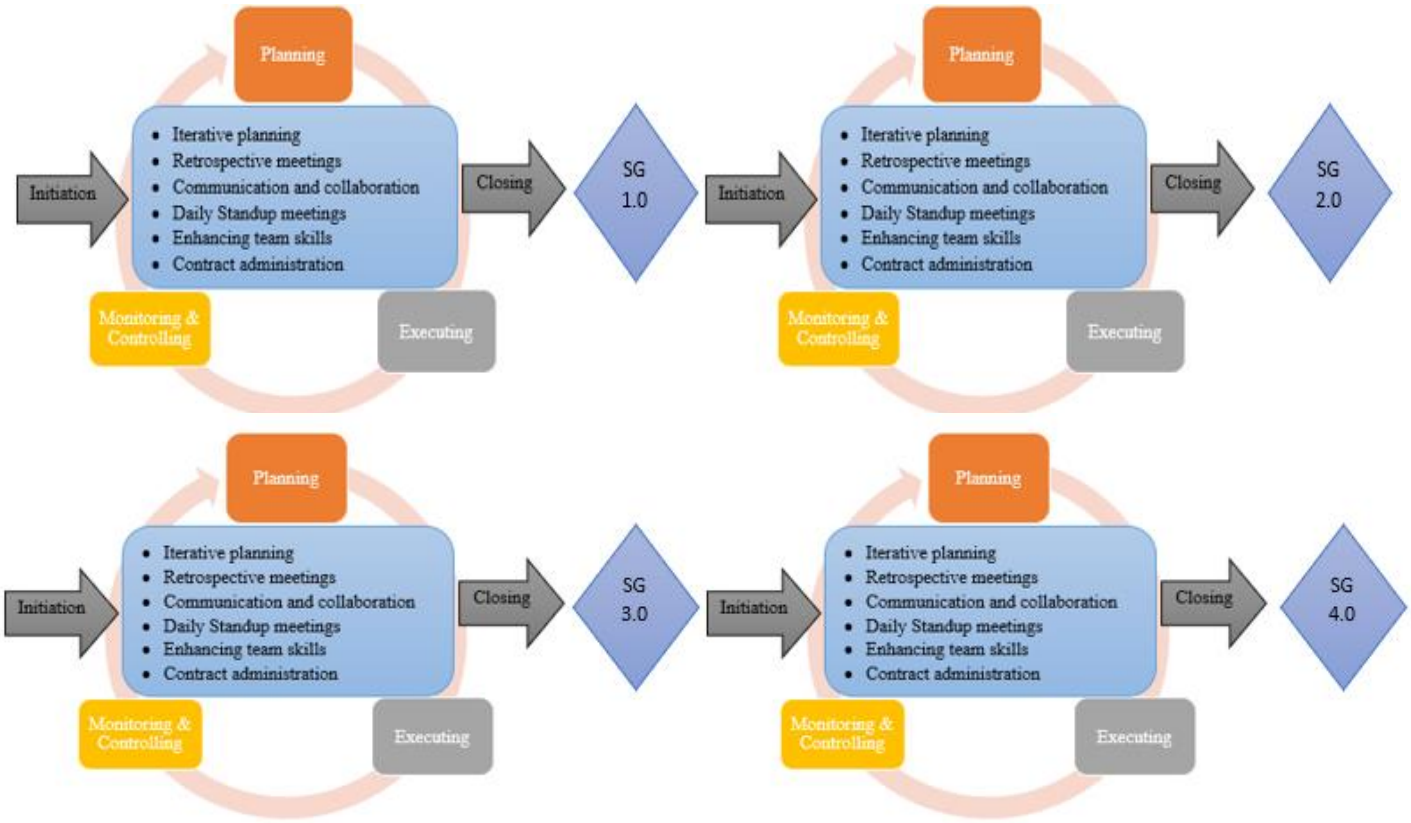

Figure 9: Hybrid Project Management Framework (Created by the Researcher)

In this hybrid framework, distinct variances are delineated between traditional and Agile methodologies, as summarized in Table below.

Traditional Contract	**Agile Contract**
• Requests are predetermined with a fixed scope, and changes are carefully controlled. • The solution is determined upfront, specifying project scope, delivery time, and total contract cost. • Usually linked with infrequent, large-scale releases. • Rooted in compliance standards. • Quality is ensured and supervised through inspection and governance. Evaluation and	• Requests are subject to frequent changes based on buyer's needs, evolving requirements, or market dynamics. • The solution is an evolving entity, grounded in hypotheses and developed incrementally through iterative processes. Requirements are agreed upon during concise planning sessions between seller and buyer in each iteration. • Value is delivered regularly through continuous releases, with individual

validation typically occur at project completion or key milestones. • The "definition of done" is agreed upon only upon meeting contract terms.	components contributing to the final solution potentially released within weeks. • Reliance is placed on trust and transparent communication. • Quality is attained through collaborative development efforts. The seller shares completed project aspects at the conclusion of each iteration. • The definition of done is established when a minimum viable product is produced.

Hence, all APM best practices identified in this study garnered unanimous recognition from both the questionnaire survey respondents and the interviewees. These findings hold significant implications for process automation sector, which predominantly adheres to the TPM framework. The survey responses and interview feedback underscore project managers' awareness of APM benefits and potential implementation challenges within this sector. Their resounding agreement and endorsement of APM best practices signify readiness for embracing the hybrid framework. Therefore, it falls upon the leadership to spearhead the adoption of this new framework and its associated practices.

6.5 Conclusion

This study explores the challenges faced in executing process automation projects, which often encounter significant delays due to their complex nature. The research adopts a mixed-methods approach, combining a questionnaire survey with in-depth interviews to gather insights from project management professionals and experienced consultants.

The findings highlight various factors contributing to project delays, including contractual issues, communication breakdowns among vendors, inadequate planning, HR planning deficiencies, labor challenges, and budget inaccuracies.

Six hypotheses were formulated to investigate the effectiveness of introducing Agile practices within the traditional project management framework to reduce delays. These include

incorporating Agile iteration planning, retrospective meetings, daily stand-up meetings, communication and collaboration, enhancement of team skills, and addressing contractual issues. The results suggest that integrating these Agile practices can indeed mitigate project delays and tackle project complexity effectively. The study proposes a hybrid project management methodology that combines Agile and traditional approaches to enhance clarity, trackability, flexibility, and adaptability in process automation projects.

By identifying and implementing practical Agile best practices within the traditional framework, this research offers valuable insights to improve project efficiency and reduce delays in the process automation sector. However, challenges may arise from project managers lacking the necessary experience and expertise to implement the hybrid framework effectively.

In conclusion, the hybrid model is recommended as a viable solution for addressing project delays and complexity in process automation projects, offering a pathway for improved project management practices in the sector.

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Appendix (Research Survey + Interview transcripts)

Enhancing Organizational Success in the Process Automation Field through Agile Project Management

"Please note that the responses provided do not represent any organization in any way. Your answers will remain anonymous and will be used solely for research purposes. Thank you for sharing; your feedback is valuable and will remain confidential."

* Indicates required question

1. What is your gender? *

   Mark only one oval.

   - ◯ Male
   - ◯ Female

2. How many years of experience do you have in your role?

   Mark only one oval.

   - ◯ 0-5
   - ◯ 5-10
   - ◯ 10-15
   - ◯ 15+ Years

3. What is your job title?

Mark only one oval.

- ◯ Consultant
- ◯ Specialist
- ◯ Engineer
- ◯ Senior Engineer
- ◯ Planner
- ◯ Project Manager
- ◯ Other: _____

4. What type of project(s) are you currently dealing with in your company?

Tick all that apply.

- ☐ Oil & Gas Process Automation
- ☐ Power Facility Process Automation
- ☐ Buildings
- ☐ Other: _____

5. What type of project management framework do you currently use?

Mark only one oval.

- ◯ Traditional Project Management Framework (Customised)
- ◯ Traditional Project Management Framework (PMI)
- ◯ Traditional Project Management Framework (PRINCE2)
- ◯ Agile Project Management Framework.
- ◯ Hybrid Framework (Agile/Traditional)
- ◯ Other: _____

6. (If Agile is selected) What type of Agile methodology do you use?

Mark only one oval.

- Agile Scrum
- Lean
- DSDM
- Kanban
- Crystal
- Extreme Programming
- Feature Driven Development
- N/A
- Other: _____

7. What is the average length of your current or previous project life cycle?

Mark only one oval.

- Less than 1 year
- 1-2 Years
- 3-4 Years
- More than 4 years

8. How many people were/are involved in the project from your company (not including contracts)?

Mark only one oval.

- 1-20
- 20-40
- 40-60
- 60-80
- 80-100
- 100 or more

9. What is the size of your current project?

Mark only one oval.

- ◯ Small Scale Project
- ◯ Medium Scale Project
- ◯ Large Scale Project
- ◯ Other: _____

10. How would you describe the way your team mostly works?

Mark only one oval.

- ◯ Virtual [team members interact virtually from different locations]
- ◯ Same Building
- ◯ Same Site
- ◯ Virtual & on site

11. Individuals and interactions are prioritised over tools and processes.

Mark only one oval.

- ◯ Strongly agree
- ◯ Agree
- ◯ Neutral
- ◯ Disagree
- ◯ Strongly Disagree

12. Collaborating with customers is prioritised over contract negotiation?

Mark only one oval.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

13. Working software is prioritised over comprehensive documentation

Mark only one oval.

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

14. Responding to change is prioritised over following a plan

Mark only one oval.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

15. Please rank the following in order of importance to the timely completion of projects, where 1 is most important and 6 is least important *

Mark only one oval per row.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Effective Communication					
Choosing Appropriate Project Management Framework					
Resource Availability					
Team Competency					
Scope Change Flexibility					
Swift Decision Making					

16. If the company were to implement evaluation of projects through retrospective meetings, this would:

Mark only one oval per row.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Facilitate the frequent adjustment of processes	◯	◯	◯	◯	◯
Help to involve clients in project planning	◯	◯	◯	◯	◯
Enable project managers to adapt more effectively to changes.	◯	◯	◯	◯	◯
Enable project managers to mitigate risks before they become issues.	◯	◯	◯	◯	◯

17. If the company were to implement iteration planning (dividing the project into smaller iterations), Dividing the project into smaller iterations could reduce unidentified risks

Mark only one oval per row.

	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
Increase flexibility	◯	◯	◯	◯	◯
Increase the frequency of acceptance of project changes	◯	◯	◯	◯	◯
Dividing the project into smaller iterations could reduce unidentified risks	◯	◯	◯	◯	◯
Improve planning and scheduling processes	◯	◯	◯	◯	◯

18. If the company were to implement daily project meetings, this would:

Mark only one oval per row.

	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
Emphasise the importance of self-organising teams					
Reduce the potential for misguided objectives and ensure that deliverables are linked with objectives.					
Reduce conflicts among the project's essential players					
Enable teams to evaluate and discover ways to adjust their processes in a frequent manner					
Provide an opportunity for the development of an action plan that identifies areas of improvement					

19. If the company were to implement a procedure to facilitate more frequent communication and team collaboration, this would:

Mark only one oval per row.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Reduce delays in decision making					
Facilitate improvements in the definition of the project's scope					
Facilitate improvements in risk planning					
Help project personnel to better understand client requirements					
Facilitate improvements in coordination between project teams					

20. If the company were to implement strategies and processes to improve the skills levels of the team (including training and hiring skilled contractors and managers), this would:

Mark only one oval per row.

	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
Facilitate improved interaction and support between team members	◯	◯	◯	◯	◯
Improve team leadership and coordination	◯	◯	◯	◯	◯
Enable the team to better identify and mitigate risks	◯	◯	◯	◯	◯
Make project teams more productive and focused	◯	◯	◯	◯	◯

21. If the company were to implement changes to the administration of contracts, the following processes would help to reduce delays in project completion:

Mark only one oval per row.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Timely payment of contractors	◯	◯	◯	◯	◯
Setting and adhering to deadlines governing how new equipment is delivered	◯	◯	◯	◯	◯
Setting and adhering to deadlines governing how quickly land acquisition issues are solved	◯	◯	◯	◯	◯
Setting and adhering to deadlines governing how quickly decisions are made	◯	◯	◯	◯	◯

22. To what extent do you agree with the following statement?

Mark only one oval per row.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Delays to the completion of projects are unavoidable	◯	◯	◯	◯	◯
Delays to the completion of projects are caused by the approach to project management we use	◯	◯	◯	◯	◯
A different approach to project management could help reduce delays to project completion	◯	◯	◯	◯	◯
Delays to the completion of projects are within our control	◯	◯	◯	◯	◯

Interview Transcripts
Participant A

Interviewer: Please share your experience in project management.
Participant A: Sure, I've been a lead project engineer in the company for almost nine years now, handling various projects, with a focus on Process Automation projects. Due to the nature of these projects, I've gained experience in both agile and waterfall models.

Interviewer: What are the primary causes of delays in the process automation sector?
Participant A: In my experience, the main challenge stems from the persistent use of traditional project management approaches by most managers in this industry.

Interviewer: Can you elaborate on that?
Participant A: Certainly. What I mean is that there are significant deficiencies in vendor interactions, particularly during the engineering and procurement stages. When contract issues arise, it becomes nearly impossible to execute the project on schedule. Additionally, poor planning exacerbates these challenges.

Interviewer: Could you provide further clarification?
Participant A: Certainly. In many large-scale projects, project managers often overlook or are uncertain about every deliverable involved. They fail to anticipate unforeseen circumstances, which ultimately slows down project delivery. Additionally, inadequate communication, subpar planning, and failure to identify and enhance team skills can all contribute to project delays.

Interviewer: Is there a way to mitigate these delays?
Participant A: Absolutely, I firmly believe that many of the factors contributing to delays can be avoided.

Interviewer: And how can these delays be addressed?
Participant A: Well, there are certain measures that can be taken to tackle these issues during project implementation. For example, adopting modern project management methods like agile could be beneficial.

Interviewer: What are your thoughts on Agile Project Management (APM)?
Participant A: To me, APM involves executing a project in short phases or stages, ensuring completion of each task before moving on to the next. It's essentially an iterative and flexible approach to project management, commonly used in software development.

Interviewer: So, for you, does APM involve flexibility?
Participant A: Absolutely. An agile approach is all about being flexible and adaptable, which enables teams to mitigate risks effectively.

Interviewer: So, does introducing iteration planning in Traditional Project Management (waterfall) lead to faster delivery of process automation projects?
Participant A: I believe iteration planning is crucial in Agile Project Management as it aligns the project manager, client, and the team on expected deliverables, complexity, and individual responsibilities. This synchronization enhances project efficiency and can lead to faster delivery.

Interviewer: So, to clarify, do you believe that adding iteration planning to a waterfall model in process automation can lead to faster delivery?
Participant A: Yes, I do. Integrating iteration planning into the management of process automation projects can address typical delay issues by establishing a common cadence and setting clear boundaries for work.

Interviewer: Alright, moving on. Do you think introducing retrospective meetings in Traditional Project Management can speed up the delivery of process automation projects?
Participant A: Yes, I do. Retrospective meetings, also known as sprint retrospectives, allow teams to reflect on their work and devise improvement plans for the next sprint. So, introducing these meetings in traditional project management can indeed lead to faster delivery of process automation projects.

Interviewer: Could you explain what you mean by "sprints"?
Participant A: Certainly. Sprints are short, time-bound stages during which project teams work to complete a defined amount of work before moving on to the next stage.

Interviewer: Understood. Now, does implementing communication and collaboration in Traditional Project Management result in quicker delivery of process automation projects?
Participant A: Absolutely. Effective communication and collaboration are essential in any project, regardless of the methodology used. Without them, there's a high risk of chaos and project failure in the long run. I firmly believe that fostering collaboration and maintaining open communication channels are critical factors for ensuring the success of projects.

Interviewer: How exactly does improved communication contribute to faster project delivery?
Participant A: One of the major reasons for project delays in process automation is that communication primarily happens through written channels, often at the project's outset. Agile methodologies address this by promoting enhanced communication, particularly through stand-up and retrospective meetings. This emphasis on improved communication is one of the core benefits of Agile Project Management.

Interviewer: Alright. So, do you think introducing daily stand-up meetings in Traditional Project Management can accelerate the delivery of process automation projects?
Participant A: Yes, as I mentioned earlier, meetings like retrospective sprints or iteration planning can significantly expedite the project's pace. This facilitates better organization, strategizing, and alignment among team members toward achieving project goals.

Interviewer: How long should these daily stand-up meetings ideally last?
Participant A: To maintain efficiency and engagement, I believe daily stand-up meetings should be kept brief, ideally lasting between 15 to 20 minutes. Their purpose is to ensure everyone is briefed on the day's deliverables and then quickly return to work.

Interviewer: Understood. Moving on, can identifying and enhancing team skills in Traditional Project Management lead to faster delivery of process automation projects? If so, how?
Participant A: Absolutely. Agile advocates emphasize the importance of teamwork in project success, where cohesive teams prioritize collective goals over individual achievements. Identifying team competencies ensures that tasks are assigned based on individual proficiency, maximizing resource utilization and project efficiency.

Interviewer: Could you explain what you mean by matching tasks with proficiency?
Participant A: Essentially, it means assigning tasks to individuals based on their strengths and expertise. For example, if someone excels at Task A, they should focus on that rather than being assigned Task B, where they may not perform as effectively. This ensures optimal utilization of team skills.

Interviewer: Got it. Finally, do you believe resolving contractual issues in Traditional Project Management contributes to faster delivery of process automation projects?
Participant A: Absolutely. As a project manager, addressing contractual issues early on is crucial. By resolving these issues promptly, project development can proceed smoothly without disruptions caused by contractual disputes, ultimately leading to faster delivery of project outcomes.

Interviewer: Okay. Moving on to the next question, how can the Agile Project Management (APM) best practices and enablers be applied within the traditional waterfall framework?
Participant A: To address this, it's crucial to understand what constitutes Agile best practices. These include meetings, proactive planning, streamlined design, effective communication, continuous integration, and close collaboration with customers. Integrating these practices into a traditional project management model should be straightforward as they align well with the core principles of Agile.

Interviewer: So, essentially, you're suggesting identifying these best practices and implementing them within the waterfall model?
Participant A: Yes, exactly. That's precisely what I mean.

Interviewer: What are the strengths and weaknesses of integrating Agile best practices into Traditional Project Management (waterfall)?
Participant A: Primarily, we've discussed the benefits of incorporating Agile practices into waterfall models, such as facilitating faster project delivery and ensuring tasks are executed optimally. Honestly, I don't see many weaknesses in this approach because a hybrid method tends to complement both approaches, addressing their respective weaknesses.

Interviewer: Alright. On to the last question, how can a hybrid project management (combining traditional and Agile) address project complexity to minimize delays in process automation projects?
Participant A: Experienced project managers can effectively blend Agile principles into a waterfall environment to enhance project predictability. One effective model for this industry is the water-scrum-fall approach, which leverages the strengths of both Agile and waterfall methodologies. By harnessing the best of both worlds, a hybrid approach can mitigate delays and streamline project execution.

Interviewer: Would you like to add anything else to this discussion?
Participant A: Not really. I believe we've covered all the essential aspects of the topic. However, it's worth noting that while both methodologies are applicable in the process automation sector, a hybrid approach offers significant benefits in reducing delays and overcoming bottlenecks. But it's crucial to have experience in utilizing this hybrid methodology effectively. So, that's pretty much it.

Interviewer: Okay, thank you very much for your time and contribution to this interview. I highly appreciate it.

Participant A: You're welcome.

Participant B

Interviewer: Please tell me a little bit about yourself and your experience in project management.
Participant B: I've been with XYZ-Company for the past years, working as a project consultant in the process automation and oil and gas industry for over 14 years now. I've gained considerable experience in managing projects in this sector.

Interviewer: Great. What do you think are the causes of delays in the process automation sectors in general?
Participant B: Personally, I believe project delays in the process automation industry stem from issues such as contract problems, ineffective communication and coordination, compliance labor challenges, and budget inaccuracies.

Interviewer: I see. Do you believe there are ways to reduce such delays?
Participant B: Absolutely. Adopting efficient methodologies within companies in this industry can help overcome issues like delays and project failures.

Interviewer: Speaking of methodologies, what are your thoughts on Agile Project Management (APM) and its significance to you as a leader and to your projects?
Participant B: To me, APM involves executing projects iteratively, focusing on completing tasks before moving to the next stage. It emphasizes collaboration and flexibility over rigid processes, valuing effective communication.

Interviewer: How does this differ from the waterfall methodology?
Participant B: In waterfall, project managers prioritize following a predetermined plan, whereas in APM, the focus is on adapting to changes and project requirements as they arise, leading to faster project delivery and adaptability.

Interviewer: Okay. Do you think the introduction of iteration planning in Traditional Project Management (waterfall) can expedite the delivery of process automation projects?
Participant B: Yes, I believe it can.

Interviewer: Could you clarify how?
Participant B: Iteration planning involves looking ahead, considering various possibilities, risks, objectives, and realistic deliverables. It's crucial for project managers to understand the purpose of this planning session.

Interviewer: And what is the purpose, in your view?
Participant B: The purpose of iteration planning, from my perspective, is for the project team to reach a consensus on key elements such as objectives, risks, and deliverables.

Interviewer: Understood. Can the introduction of retrospective meetings in Traditional Project Management (waterfall) lead to faster delivery of process automation projects?
Participant B: I believe the effectiveness of agile projects largely stems from their emphasis on meetings and planning. Retrospective meetings provide an opportunity for the team to implement improvements, reflect on past work, and identify successful elements. Therefore, integrating such meetings into traditional project management can indeed expedite project delivery.

Interviewer: Please elaborate on how reflecting on improvements can accelerate the delivery of process automation projects?
Participant B: When you reflect on past work and identify areas for improvement, you mitigate the risk of recurring errors that could impede the project's progress. By addressing these risks, you create a foundation for greater efficiency and faster delivery.

Interviewer: Perfect. So, do you think that the introduction of communication and collaboration in Traditional Project Management (waterfall) can lead to faster delivery of projects?
Participant B: Absolutely. Effective communication is essential in any professional setting, especially in complex projects like those in the process automation industry, which require extensive coordination and

teamwork. Incorporating agile communication practices into the traditional waterfall framework can indeed expedite the delivery of large, intricate projects by allowing the team to anticipate and address issues proactively.

Interviewer: Well understood. Do you think the introduction of daily stand-up meetings in Traditional Project Management (waterfall) can lead to faster delivery of process automation projects?
Participant B: Not necessarily. In complex environments like process automation, daily stand-up meetings may not be suitable. In fact, they can become cumbersome and irrelevant as sit-down meetings. The format often leads to discussions that aren't pertinent to the project's progress. While I advocate for iteration planning and retrospectives, I don't see daily stand-ups as beneficial in this context.

Interviewer: So, in other words, you don't believe daily stand-up meetings can expedite the delivery of process automation projects?
Participant B: Exactly. I believe they would be counterproductive and only serve to waste time.

Interviewer: Okay. Moving on to the next question, do you think identifying and enhancing team skills in Traditional Project Management (waterfall) can lead to faster delivery of process automation projects? If yes, how?
Participant B: Absolutely. This is a critical agile practice that can significantly improve and accelerate waterfall models in the process automation sector. Without identifying and enhancing team skills, it's challenging to execute these projects effectively. Having a team that possesses the necessary skills and continuously improves them not only speeds up delivery but also enhances the final product.

Interviewer: So, you believe project managers should focus on identifying and enhancing team skills to improve project delivery?
Participant B: Absolutely, yes.

Interviewer: Does solving contractual issues in Traditional Project Management (waterfall) lead to faster delivery of process automation projects? If so, how?
Participant B: Addressing contractual issues early in the project is crucial to avoid potential delays. In the demanding environment, any disruptions in contract management can adversely affect not only project timelines but also overall productivity and revenue.

Interviewer: Great. So, how can the APM best practices and enablers be applied in the waterfall framework in process automation projects?
Participant B: Integrating Agile best practices into traditional project management involves selectively incorporating agile elements that enhance the waterfall model. For example, introducing retrospective meetings for reviewing past work, planning for the future, and continuous improvement can be one such adaptation. The same approach applies to incorporating agile elements like communication and collaboration.

Interviewer: So, it's basically about adding agile elements that you feel your waterfall design really needs?
Participant B: Exactly. It's about identifying and implementing agile elements that can augment the effectiveness of the existing waterfall framework.

Interviewer: Okay. What do you think are the strengths and weaknesses of introducing Agile best practices in traditional project management (waterfall) model?
Participant B: Introducing Agile best practices can accelerate project execution by fostering continuous improvement and enhancing team collaboration. For example, retrospective meetings can lead to valuable insights and improvements in project delivery. However, the challenge lies in ensuring effective execution of the hybrid methodology. Without proper implementation, it can result in inefficiencies and wasted efforts due to continuous administrative intervention.

Interviewer: All right, in conclusion, how can a hybrid PM (traditional + Agile) deal with project complexity to reduce project delays?
Participant B: A hybrid project management approach offers the flexibility needed to address the complexities of process automation projects. By combining the strengths of both traditional and Agile methodologies, such

as adapting to changing requirements and maintaining structured processes, project delays can be minimized. This approach facilitates faster and high-quality project delivery in the sector.

Interviewer: Well understood, is there anything else you would like to add to this discussion?
Participant B: I would emphasize that while a hybrid methodology appears straightforward in theory, its successful implementation requires experienced and collaborative teams. Effective communication and skillful execution are essential for ensuring the seamless integration of traditional and Agile practices in the workplace.

Interviewer: Okay. Thank you very much for taking part in this interview. I appreciate it.

Participant B: I'm happy to contribute.

Participant C

Interviewer: Please share some insights into your experience in project management.
Participant C: Over the past two decades with XYZ-Organization, I've progressed from various positions to become the senior project manager. Prior to that, I spent few years in construction.

Interviewer: Impressive. So, what do you believe are the primary causes of delays in the process automation sector?
Participant C: To simplify, I believe delays stem from inadequate communication, coordination, planning, the tendency to apply one-size-fits-all solutions, overlooking quality control, and scope creep. Contractual issues can also significantly impede TPM projects.

Interviewer: Can you provide an example to illustrate how any of these factors contribute to project delays?
Participant C: Certainly. Neglecting quality control, for instance, can lead to issues later on that disrupt project timelines and may necessitate rework, thereby causing delays.

Interviewer: What are your thoughts on Agile and what does Agile Project Management (APM) mean to you as a leader and for your projects?
Participant C: Agile represents a contemporary project management approach favoring adaptability over rigid planning. This methodology, increasingly adopted across industries including process automation, emphasizes iterative stages, prioritizes communication, collaboration, continuous releases, and client feedback.

Interviewer: Do you believe implementing Agile methodology in the process automation sector can enhance project performance?
Participant C: Absolutely. APM aims to streamline processes and responses, enhancing overall efficiency.

Interviewer: Does introducing iteration planning in Traditional Project Management (waterfall) lead to faster delivery of process automation projects? How?
Participant C: Indeed. Planning ahead is essential in any serious endeavor.

Interviewer: Could you elaborate on that?
Participant C: Iteration planning enables realistic forward planning, allowing teams to focus on specific targets, thereby expediting task completion and overall project delivery.

Interviewer: Similarly, do retrospective meetings in Traditional Project Management (waterfall) contribute to faster delivery of process automation projects?
Participant C: Yes, retrospective meetings, like iteration planning, play a vital role in a waterfall project management setup. They afford teams an opportunity to reflect on past achievements, identify areas for improvement, and apply those insights to future tasks**.**

Interviewer: How does this lead to faster project delivery, in your opinion?
Participant C: Continuous improvement and addressing challenges early on help prevent errors and setbacks, ultimately facilitating timely project completion.

Interviewer: Moving on, do you believe that communication and collaboration in Traditional Project Management (waterfall) can expedite process automation project delivery?
Participant C: Absolutely. Effective communication and collaboration are foundational in any complex project, such as those in the process automation sector. They not only improve project delivery but also foster teamwork and harmony critical to project success.

Interviewer: Could you provide further insight into how this facilitates faster project delivery?
Participant C: Comprehensive reporting, communication channels, and coordinated efforts ensure all team members are aligned and working towards common project goals, thus enhancing efficiency and expediting delivery.

Interviewer: Do you think daily stand-up meetings in Traditional Project Management (waterfall) contribute to faster project delivery? How?
Participant C: While stand-up meetings have their benefits, particularly in distributing relevant information and facilitating quick decision-making, they must be conducted efficiently to avoid unnecessary delays. These meetings provide a platform for each team member to present their daily targets, fostering accountability and progress tracking.

Interviewer: On a related note, can identifying and enhancing team skills in Traditional Project Management (waterfall) accelerate project delivery? How?
Participant C: Yes, integrating agile principles, including identifying and enhancing team skills, can significantly improve project delivery in the sector. Matching tasks with the right skill sets ensures efficient resource utilization and higher-quality deliverables, ultimately expediting project completion.

Interviewer: How does solving contractual issues in Traditional Project Management (waterfall) contribute to faster delivery of projects?
Participant C: Addressing contractual issues early in the project management process is crucial to ensuring smooth project execution. Failure to do so can lead to disruptions and legal complications, which may delay project timelines and impact overall productivity.

Interviewer: Shifting focus, how can Agile Project Management best practices and enablers be integrated into the waterfall framework for project automation projects?
Participant C: Integrating Agile best practices into traditional project management involves selectively incorporating agile elements that complement the existing waterfall model. This could include enhancing communication, collaboration, and iterative planning within the framework of structured project requirements and specifications.

Interviewer: What do you perceive as the strengths and weaknesses of applying Agile best practices in Traditional Project Management?
Participant C: The main strength lies in the potential to enhance agility and quality within the project, streamlining processes and improving responsiveness. However, the challenge lies in effectively integrating Agile practices into the waterfall model, as improper implementation may result in inefficiencies and time wastage.

Interviewer: Could you elaborate further on this point?
Participant C: Successful integration requires experience and skill to navigate the complexities of both methodologies seamlessly**.**

Interviewer: Before we conclude, how can a hybrid Project Management approach effectively manage project complexity and reduce delays in process automation projects?
Participant C: By combining the strengths of both traditional and Agile methodologies, a hybrid approach offers the flexibility needed to address project complexities and adapt to changing requirements swiftly. This facilitates faster and more efficient project delivery in the dynamic sector.

Interviewer: Is there anything else you'd like to add to our discussion?
Participant C: It's evident that the landscape of project management is evolving, and companies embracing hybrid methodologies stand to gain significant advantages in terms of efficiency and project outcomes, particularly in large-scale endeavors like process automation projects.

Interviewer: Thank you for your valuable insights and participation in this interview.

Participant C: It was my pleasure.

Participant D

Interviewer: Could you please share some insights into your experience in project management?
Participant D: Certainly. Over the past five years at this company, I've worked in various project roles. With a background in project management and significant hands-on experience, I consider myself well-versed in a variety of project management approaches.

Interviewer: Based on your experience, what do you believe are the primary causes of delays in the process automation sector overall?
Participant D: In my opinion, the main causes of delays, stem from inadequate planning, ineffective communication, and delayed handling of contractual matters. These factors can significantly hinder project progress and ultimately lead to delays in delivery.

Interviewer: Do you think these delays can be mitigated?
Participant D: Absolutely. I believe it's crucial to remain flexible and proactive in addressing challenges. By adopting more adaptive management methods and addressing issues promptly, delays can be minimized.

Interviewer: Speaking of management methodologies, what are your thoughts on Agile Project Management (APM) and its significance to your role as a leader and to your projects?
Participant D: Agile Project Management emphasizes responsiveness and efficiency in project execution. As a leader, it means implementing strategies that allow for faster adaptation to changing requirements. For projects, it translates to iterative processes, enabling teams to deliver results more quickly while ensuring alignment with project goals.

Interviewer: Mmm Just to add more clarity to your point, for you, agile methods are about fast delivery as well as working smart and strategically?
Participant D: Yes, precisely. While agility implies speed, it also entails strategic decision-making and smart execution to ensure that the delivered outcomes meet the project objectives effectively.

Interviewer: Do you think the introduction of iteration planning in current Traditional Project Management (waterfall) can lead to faster delivery of process automation projects?
Participant D: Indeed, iteration planning can play a significant role in expediting project delivery within a traditional waterfall framework. By breaking down tasks into manageable iterations and establishing clear objectives, teams can maintain focus and achieve milestones more efficiently.

Interviewer: So for simplicity, how do you think this leads to faster delivery of process automation projects?
Participant D: Iteration planning promotes incremental progress and allows for early identification and resolution of issues. This iterative approach ensures that projects move forward steadily, leading to faster overall delivery.

Interviewer: Can the introduction of retrospective meetings in Traditional Project Management (waterfall) lead to faster delivery?
Participant D: Absolutely. Retrospective meetings provide teams with an opportunity to reflect on their progress, identify areas for improvement, and make necessary adjustments. By incorporating these meetings into the project management process, teams can enhance their efficiency and accelerate project delivery.

Interviewer: Can you please elaborate?
Participant D: Certainly. Retrospective meetings enable teams to learn from past experiences and continuously improve their processes. By addressing challenges proactively and refining their approach, teams can work more effectively and deliver projects at a faster pace.

Interviewer: So, does the introduction of communication and collaboration in Traditional Project Management (waterfall) can lead to faster delivery?

Participant D: Yes, effective communication and collaboration are crucial for expediting project delivery in any context. By promoting transparency, facilitating information flow, and fostering teamwork, projects can progress more smoothly and achieve their objectives more rapidly.

Interviewer: Can you explain how?
Participant D: When teams communicate openly and collaborate effectively, they can streamline processes, resolve issues promptly, and make informed decisions. This collective effort ensures that projects stay on track and are completed within the stipulated timeframes.

Interviewer: To clarify, how can this be achieved?
Participant D: By establishing clear communication channels, encouraging active participation, and fostering a culture of collaboration within the project team, organizations can facilitate faster decision-making and problem-solving, ultimately leading to accelerated project delivery.

Interviewer: Moving on to the next question. Do you think the introduction of daily stand-up meetings in Traditional Project Management (waterfall) can lead to faster delivery? How?
Participant D: Yes, daily stand-up meetings can contribute to faster project delivery by promoting alignment, accountability, and focus within the team. These brief, daily gatherings enable team members to synchronize their efforts, identify any obstacles, and prioritize tasks effectively, thereby enhancing overall productivity and progress.

Interviewer: Okay. And do you think identifying and enhancing team skills in Traditional Project Management (waterfall) can lead to faster delivery?
Participant D: Absolutely. Investing in team skills ensures that tasks are performed efficiently and effectively, leading to faster project delivery and improved quality outcomes. By aligning skill sets with project requirements and providing opportunities for continuous learning and development, organizations can enhance their teams' performance and productivity.

Interviewer: Please elaborate more.
Participant D: By ensuring that team members possess the necessary skills and competencies to fulfill their roles effectively, organizations can minimize errors, avoid rework, and expedite project completion. This strategic approach to talent management directly contributes to faster delivery and better project outcomes.

Interviewer: Do you believe resolving contractual issues in Traditional Project Management (waterfall) can lead to faster delivery of process automation capital projects?
Participant D: Absolutely, yes. Timely resolution of contractual issues is paramount for ensuring that necessary resources are available when and where they are needed during project execution. Without proper contracts in place, meeting project deadlines becomes challenging.

Interviewer: How do you suggest we can achieve that?
Participant D: By addressing contractual matters early in the project lifecycle, organizations can mitigate potential delays. It's essential to proactively manage contracts for materials, workforce, and other resources, resolving any issues promptly to avoid hindering project progress.

Interviewer: Great. Now, could you explain how APM best practices can be applied in the Traditional Project Management waterfall framework in process automation projects?
Participant D: It's relatively straightforward. By integrating elements of Agile methodology into the traditional waterfall framework, project managers can enhance project management practices. For instance, incorporating features like iterative planning and retrospective meetings can improve adaptability and efficiency in project execution.

Interviewer: And what do you perceive as the strengths and weaknesses of applying Agile best practices in the Traditional Project Management (waterfall) model?
Participant D: The strength of applying Agile practices lies in its ability to enhance planning, delivery speed, focus, and communication within the traditional waterfall model. However, there's a risk of complexity when incorporating numerous Agile features into the waterfall framework, potentially leading to confusion and inefficiency if not managed properly.

Interviewer: As an expert, how do you think a hybrid PM (traditional + Agile) can tackle project complexity to reduce delay?
Participant D: A hybrid approach allows project managers to leverage the strengths of both traditional and Agile methodologies. By agreeing on deliverables early in the project cycle and incorporating effective communication, collaboration, and planning practices, hybrid PM can address project complexity more efficiently, leading to reduced delays and improved project outcomes.

Interviewer: To conclude, is there anything else you'd like to add to this discussion?
Participant D: Not at the moment, unless there's a need for further clarification on any aspect.

Interviewer: I think we've covered everything relevant to my inquiry. Thank you for your insights and time.

Participant D: You're welcome, and best of luck with your investigation.

Participant E

Interviewer: Can you share some insights into your experience in project management?
Participant E: Certainly. I've been working as a senior project engineer at XYZ-Company for the past seven years. Throughout this time, I've been involved in various projects which have significantly enhanced my skills. I believe I now possess considerable project management experience**.**

Interviewer: Given your experience, what do you believe are the primary causes of delays in the process automation sector overall?
Participant E: In the process automation sector, one major cause of delays is the complexity of contracts. The lengthy process of drafting, agreeing upon, and implementing contracts can significantly impact project timelines and costs. Additionally, postponing the resolution of project issues until later stages rather than addressing them promptly can also lead to delays.

Interviewer: Do you think these delays can be mitigated? If so, how?
Participant E: Yes, I do believe they can be mitigated. It may require a shift in the approach to project management, potentially adopting more proactive strategies to address issues as they arise.

Interviewer: What are your thoughts on Agile Project Management (APM) and its significance to your role as a leader and to your projects?
Participant E: Agile Project Management emphasizes iterative processes, collaboration, and continuous improvement. As a leader, it allows me to instill these principles into project management, promoting faster delivery and higher quality outcomes.

Interviewer: How do you think the introduction of iteration planning in Traditional Project Management (waterfall) can impact the delivery of process automation projects?
Participant E: Iteration planning enables teams to prioritize tasks and delegate responsibilities effectively. By setting clear goals and directions, it facilitates smoother project execution and ensures progress is made within the specified timelines.

Interviewer: Could you elaborate on how iteration planning sets the direction for the team?
Participant E: Certainly. Iteration planning provides teams with a roadmap of tasks to be accomplished within a given timeframe. This clarity helps focus efforts towards achieving project goals in a timely manner.

Interviewer: Moving on, do you believe that retrospective meetings can expedite the delivery of process automation projects? If so, how?
Participant E: Yes, retrospective meetings allow teams to reflect on their progress, identify areas for improvement, and implement necessary changes. This continuous feedback loop enhances project efficiency and keeps it on track towards completion.

Interviewer: How does the introduction of communication and collaboration in Traditional Project Management affect the delivery of process automation projects?
Participant E: Effective communication and collaboration are essential for the success of process automation projects. By fostering open communication channels and promoting teamwork, projects can progress more smoothly and achieve their objectives faster.

Interviewer: Could you provide an example of how communication and collaboration improve project delivery?
Participant E: Sure. By integrating agile communication practices into a waterfall framework, teams can address bottlenecks and challenges more effectively, leading to faster resolution and project advancement.

Interviewer: Do you think daily stand-up meetings can contribute to faster delivery of process automation projects?
Participant E: Daily stand-up meetings facilitate quick decision-making and ensure team members are aligned with project goals. While they may not directly lead to faster delivery, they help maintain momentum and address any issues promptly.

Interviewer: How about identifying and enhancing team skills? Do you think it can lead to faster delivery of process automation projects?
Participant E: Absolutely. Investing in team skills ensures that tasks are performed efficiently and effectively. This ultimately contributes to faster project delivery and higher quality outcomes.

Interviewer: Does addressing contractual issues in TPM lead to faster delivery of process automation projects?
Participant E: Yes, resolving contractual issues early on prevents delays and ensures smoother project execution. By addressing potential obstacles upfront, projects can proceed without unnecessary interruptions.

Interviewer: How can APM best practices be applied within a waterfall framework for process automation projects?
Participant E: APM best practices, such as effective communication and collaboration, can be integrated into a waterfall framework to enhance project management processes. For example, retrospective meetings can be introduced to encourage continuous improvement.

Interviewer: What do you see as the strengths and weaknesses of applying Agile best practices in a Traditional Project Management model?
Participant E: The strength lies in the ability to leverage the best of both methodologies to achieve faster and more efficient project delivery. However, poor integration of Agile practices can lead to inefficiencies and project failures if not executed properly.

Interviewer: Lastly, how can a hybrid PM approach effectively manage project complexity and reduce delays in process automation projects?
Participant E: A hybrid PM approach combines the strengths of both traditional and Agile methodologies to address project complexities and adapt to changing requirements. By leveraging the flexibility of Agile practices within a structured framework, projects can be delivered more efficiently and effectively.

Interviewer: Thank you for your insights. Before we conclude, is there anything else you'd like to add regarding the application of Agile best practices in process automation projects?
Participant E: Yes, I believe that adopting Agile best practices can significantly improve the delivery of process automation projects by promoting adaptability, collaboration, and continuous improvement. This shift towards Agile methodologies has the potential to revolutionize project management in the industry.

Interviewer: Thank you for your time and valuable input.

Participant E: You're welcome. It was my pleasure to contribute to the discussion.