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Embedding Agile Management Practices in Traditional Project Management

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ABSTRACT:

Project management of large-scale organization in the modern world experiences frequent challenges because of numerous aspects. With technological advancements and economic changes, organizations nowadays modernize their project management practices. Traditional project management has been practiced in many organizations. But in this modern competitive business world, traditional practices deal with challenges and are found to be ineffective in many contexts, particularly in adapting to changes with numerous internal and external factors. In this context, organizational agility has become an important factor for modern large-scale organizations. Over the last few decades, agile methods have emerged as a project management solution to many challenges, but embedding agile management practices in traditional project management is a very complex process, particularly for large-scale organizations. This study aims to identify the challenges of embedding agile methods and practices in traditional project management and to find out the strategies to successfully integrate agile management in traditional project management with addressing constraints and enhancing organizational agility. The methodological choice for this study has been qualitative. To find the answer to the research questions and to reflect on the research framework, a thematic analysis has been done with semi-structured interview questions. The findings highlighted challenges of agile integration, including legacy of the waterfall model, cultural resistance, mindset shifts and misunderstanding, role confusion and overlapping, resource constraints and dependencies, misalignment between internal and external workflows, and limited end-customer involvement. The findings also highlighted strategies of agile integration, including strategic planning and management support, strategic tools and structures supporting agile transition, measurement metrics, visibility and collaboration, context-based agile integration, and enablers of organizational agility. This study contributes to the contemporary project management practice, where the integration of agile methods and the hybridization of project management is emphasized, with addressing constraints and achieving organizational agility. This study provides insights into the challenges, strategies, and framework for effective integration of agile management practices into traditional project management.

KEYWORDS: Agile project management, Organizational agility, Traditional project management, Hybrid project management, Theory of constraints.

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Abbreviations

APM = Agile project management

IBM = International Business Machines Corporation

ICT = Information and communication technology

IT = Information technology

NASA = National Aeronautics and Space Administration

PMI = Project Management Institute

SAFe = Scaled agile framework

TOC = Theory of constraints

1 Introduction

In the modern dynamic business environment, organizations are compelled to adapt to changes in ways they never thought of before (Renzl et al., 2021). The traditional plan-driven project management model has been the most widely used project management approach, but it is not the best strategy for complex projects (Lalmi et al., 2021). Due to the limitations of traditional methods, project management is evolving in today's swiftly changing environment, to govern dynamic projects successfully and make acceptable changes (Ciric et al., 2019). With technology development over the years, approaches that recognize agile principles, which move away from conventional methods have gained popularity (Adelakun et al., 2017). For modern organizations, organizational agility is essential to survive numerous different challenges like the problems that many businesses experienced as a result of the covid-19 pandemic (Renzl et al., 2021). Organizations must be able to adapt to changes and recognize them in order to remain competitive (Ciric et al., 2019). Therefore, organizational agility is one strategy for adapting to these changes (Ghasemi, 2015).

The traditional strategies usually encounter difficulties in projects that involve a lot of uncertainty (Bianchi et al., 2018). Traditional methods rely on specific presumptions that become increasingly unclear as projects become more complicated, and they are not always effective (Trojanowska & Dostatni, 2017). It has been found that the theory of constraints works well for handling constraints in both single-project and multi-project settings (Apaolaza et al., 2020). In light of the rapidly evolving and demanding business environment, it is becoming more and more acceptable to apply agile management outside of software development (Ciric et al., 2019). Hybrid project management techniques have been adopted by companies that combine agile and conventional methods to handle many of the difficulties associated with contemporary business (Adelakun et al., 2017). This thesis explores the challenges and strategies of integrating agile practices with traditional project management, addressing constraints, approaching a hybrid management, and enhancing organizational agility.

1.1 Background of the study

Project management has become more challenging because of factors such as the rate at which the economic system is changing, the advancement of methods and technologies, variations to the law, the ever-evolving needs of customers, worldwide competition, the demand for specialized goods and services, and manufacturing facilities in various places (Trojanowska & Dostatni, 2017). Organizations must be able to adapt to changes and recognize them in order to remain competitive (Ciric et al., 2019). As projects nowadays are subject to frequent changes, more agile approaches become more suitable (Lalmi et al., 2021). The traditional approaches, such as the Stage-Gate way of planning, face unique challenges in unpredictable and dynamic environments (Bianchi et al., 2018). Alternative and more agile management methods are gradually replacing traditional linear processes and top to down controls because they are no longer adequate (Kerzner, 2017). According to Anca-Ioana (2019) in addition to having a very skilled, responsible, and creative workforce that can function well in a team, organizations also need to be quick to make decisions, adaptable, and flexible. These qualities are the features of organizational agility, and therefore, the traditional organization needs to adopt agile traits (Anca-Ioana, 2019). Organizational agility, or an organization's ability to react quickly and effectively to change, has gained significant attention in the research community (Hagen et al., 2024). The primary barriers to accomplishing organizational objectives are constraints (Trojanowska & Dostatni, 2017). The theory of constraints focuses on the bottleneck to increase efficiency (Ifandoudas & Chapman, 2009).

Therefore, the hybrid approach incorporates both agile and traditional project management techniques and increases project success in many sectors (Lalmi et al., 2021). Adelakun et al. (2017) mentioned that the hybrid approaches have been used by many businesses to adapt to shifting needs. Since hybrid approaches can combine the benefits of agile with the advantages of traditional practices, many companies view hybrid approaches as the finest of both agile and traditional approaches (Adelakun et al., 2017). By investigating the integration of these methodologies, this study seeks to address

challenges in the integration of agile with traditional project management, offering insights into achieving agility.

1.2 Research Objective and Questions

This thesis has the following objectives and research questions based on the issues stated in the introduction and background of the study. The objectives and research questions are related to project management practice, integration of agile management practices in traditional project management, addressing constraints, and enhancing organizational agility.

Research objectives

1. To identify the challenges of integrating agile management with traditional project management.
2. To assess strategies for integrating agile management in traditional project management processes to achieve organizational agility while addressing specific constraints.

Research questions

1. How agile project management practices can be implemented to enhance organizational agility.
   - 1.1 What challenges might arise when integrating agile methodologies into existing project management processes?
   - 1.2 What best practices and strategies can be employed to ensure successful integration of agile practices?

2 Literature Review

2.1 Organizational Agility

Agility in a business context was initially mentioned in 1982 as the capacity to react quickly to rapidly changing circumstances (Brown & Agnew, 1982). The concept of agility in the industry of manufacturing was introduced during the early 1990s by the Iacocca Institute, Lehigh University (Nagel, 1991). According to Yusuf et al. (1999) agility is a successful exploration of competitive dimensions such as speed, flexibility, innovation, quality, and profitability. Yusuf et al. (1999) describes that this is achieved through the integration of reconfigurable resources and best practices in a knowledge-intensive context, aimed at delivering customer-driven products and services in a rapidly changing market. Zitkiene & Deksnys (2018) found from numerous early research studies that revealed organizational agility is a multifaceted and complicated subject that is studied by numerous scholars from various viewpoints. Agility from the viewpoint of the capabilities and enablers that help organizations attain agility, the key practices that agile organizations employ on a daily basis, and agility from the viewpoint of how organizations respond to a changing environment (Zitkiene & Deksnys, 2018).

Organizational agility is the capacity to quickly adjust to changing market conditions or other external influences, such as emerging technologies, new competitors, demands of customers, and unexpected changes in the economy and society (PMI, 2015). According to Anca-Ioana (2019), organizational agility is often defined as the ability of an organization to respond swiftly and effectively to changes in its environment. Organizational agility in relation to its roles includes adaptation to changes, capitalizing on the environmental opportunities, and expanding a competitive edge (Anca-Ioana, 2019). According to Motwani & Katatria (2024), the definitions of organizational agility often include components such as quick response, quality, customization, agile leadership, and strategic commitment, and these elements are critical for organizations to thrive in competition and external turmoil. Vaszkun & Sziráki (2023) described organizational agility and mentioned that agile organizations are typically categorised with flat hierarchies, making

decentralized decisions, cross-functional team, agile culture, and agile leadership. Chwiłkowska-Kubala et al. (2023) acknowledge that the continually shifting market conditions and customer expectations highlight the need for agility in energy companies, and agile adaptation is seen by managers in this industry as a vital component of their company's success.

2.1.1 Core areas of the organizational agility concept

Organizations need to develop the ability to sense, perceive, and anticipate changes in their business atmosphere (Zhang & Sharifi, 2000). Sharifi & Zhang (1999) mentioned that several managerial and manufacturing tools and methods can be strategically integrated. This covers both established practices and developed agile practices, which need to be successfully combined to produce the intended effects to achieve agility (Zhang & Sharifi, 2000). In their three-stage approach to implementing agility in manufacturing organizations, Zhang & Sharifi (2000) linked four key agile capabilities, such as responsiveness, competency, flexibility, and speed to agility drivers. Additionally, they have connected a group of agility providers, such as organization, technology, people, and innovation, to the agile capabilities (Zhang & Sharifi, 2000).

Sharifi & Zhang (2001) mentioned about agility drivers that force a company to look for new ways to operate in order to keep its competitive edge, because of the external and internal changes and pressures from the business environment. Their introduced agility drivers are changes or pressure in the marketplace, competition basis, customer requirements, technology, and social factors (Sharifi & Zhang, 2001).

Fallmyr & Bygstad (2014) mentioned organizational agility enablers such as enterprise architecture and Information & communication technology. According to Fallmyr & Bygstad (2014), by offering the systems and technology to integrate business processes across organizations and to foster the development of new goods and services, ICT is a potent enabler of organizational agility. Business processes, IT infrastructure, and

enterprise systems are some of the most stable components of an organization that are addressed by enterprise architecture (Fallmyr & Bygstad, 2014).

Hagen et al. (2024) mentioned flexibility as an enabler, and organizational agility in a rapidly growing international business, maintained with regard to a thoughtful design of continuity, stability, and flexibility. Organizational agility supports rapidly growing global ventures in managing and balancing tensions (Hagen et al., 2024).

Walter (2021) mentioned about agility dimensions that refer to the specific aspects or components of an organization that need to be agile to achieve overall organizational agility. According to Mrugalska & Ahmed (2021), agility dimensions in Industry 4.0 are supply chain, workforce, processes, strategy, information system & facilities.

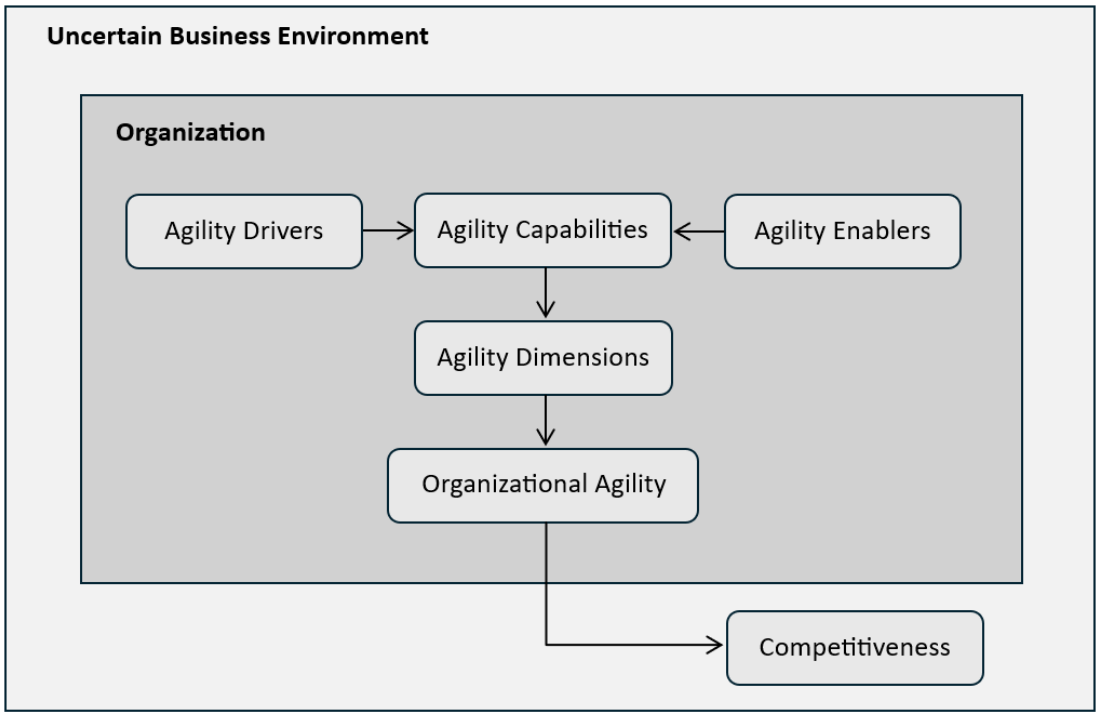

Figure 1. Basic framework of operational agility concept (Walter, 2021).

According to Walter (2021) organizational agility can be understood through the key categories: agility drivers, enablers, capabilities, and dimensions, which are interrelated as shown in **Figure 1** . Agility drivers, influenced by an uncertain business environment,

create the need for agility capabilities within organizations, which are supported by agility enablers and the capabilities are applied across agility dimensions, collectively enhancing the organization's overall agility (Walter, 2021).

2.1.2 Challenges to achieve organizational agility with traditional project management

In large organizations, traditional project management practices are typically well-established (Hobbs & Petit, 2017). Thesing et al. (2021) described the classical traditional method of Waterfall as a plan-driven approach that follows a linear process, as shown in **Figure 2.** According to Thesing et al. (2021) in this method, the expected results are distinctly defined by the customer at the start of the project, enabling the project team to work systematically toward achieving these predefined goals. The primary emphasis is on adhering to the initial plan and executing it as precisely as possible, ensuring a goal-oriented and plan-focused workflow throughout the project's lifecycle (Thesing et al., 2021).

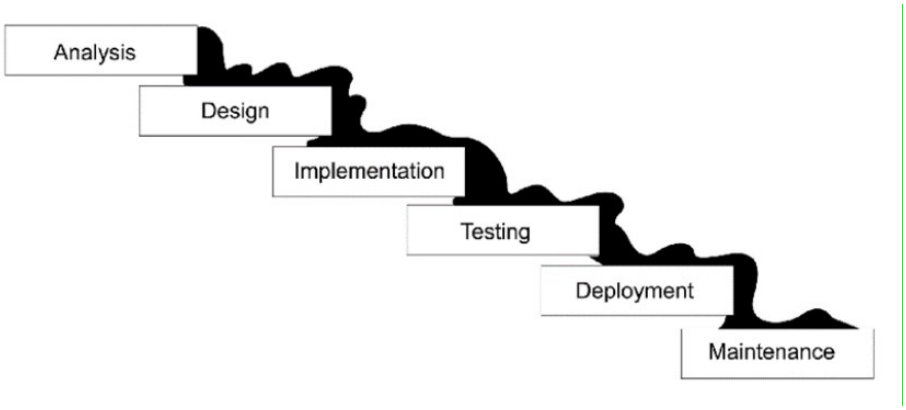

Figure 2. Waterfall model of traditional project management (DemiRag et al., 2023).

Traditional project management approaches are not equipped to manage the increased complexity arising from fast technological, economic, and social changes (Saynisch, 2010). Saynisch (2010) criticizes traditional project management as it is characterized by a linear and nondynamic structure, and this rigidity makes it difficult to respond to

unexpected challenges and changes in projects. Traditional project management is heavily focused on plan and control, and often struggles with crisis management, as they do not provide the necessary tools to turn challenges into advantages (Saynisch, 2010).

Ciric et al. (2019) states that traditional project management assumes that project circumstances are predictable and requirements are clear from the beginning. However, in reality, projects often do not follow a sequential flow, and clients may struggle to define all their requirements at the beginning (Ciric et al., 2019).

Traditional project management typically involves minimal engagement from end customers during the project lifecycle (Ciric Lalic et al., 2022). According to Thesing et al. (2021) in traditional project management, the customer may get overburdened by the necessity of fully defining every demand. The focus on adhering to the initial plan can result in the absence of customers' ongoing feedback, reduced adaptability as a result of the strict project phase sequence (Thesing et al., 2021). The biggest drawback of traditional project management is incorrect planning that results from incorrect assumptions (Thesing et al., 2021)

According to (Ballesteros-Pérez et al., 2018) in real-life schedules, activity costs and durations are inherently variable. Because of the fixed bar lengths, the Gantt chart is unable to show this variability, and this restriction prevents Gantt charts from incorporating crucial modelling components.(Ballesteros-Pérez et al., 2018).

Research on organizational agility has been distinct, and the tools used to assess organizational agility have inherent limitations (Charbonnier-Voirin, 2011). Charbonnier-Voirin (2011) mentioned that even though a number of researchers are passionate about organizational agility, the concept as a whole has received relatively little attention. Because of this, it is still mostly hypothetical how organizational agility affects different organizational variables (Charbonnier-Voirin, 2011).

Renzl et al. (2021) also point out key challenges of organizational agility, which include the existence of numerous definitions for organizational agility. Scholars have not reached a consensus, leading to fragmentation in the field and a lack of Combined knowledge development (Renzl et al., 2021). According to Renzl et al. (2021), scholars differ on the way of approach to microfoundations as everyday actions are significant to recognize organizational phenomena. They found that the relationship between agile methods and organizational agility is more complicated than normally assumed (Renzl et al., 2021).

In research on moving toward organizational agility Nejatian & Zarei (2013) identified that implementing agility requires a thorough investigation that often demands significant effort, time, and financial resources. Nejatian & Zarei (2013) mentioned that organizations may struggle to allocate these resources effectively, which can hinder their agility initiatives.

According to Nejatian & Zarei (2013) there is no set rule for choosing critical success factors (CSFs) from KPIs to moving towards organizational agility; instead, each organization should either define the right KPIs based on its needs or choose its KPIs from the ones that are already available in the literature. The desired level of organizational resources to be used and managers' willingness to fully engage with the agility context determine how they can achieve organizational agility (Nejatian & Zarei, 2013).

Appelbaum et al. (2017) emphasized several challenges of organizational agility in an unstable business environment, and these are organizations' established traditional structure, leadership models, and culture. Hagen et al. (2024) mentioned the challenges to implementing organizational agility in fast-growing global ventures, such as structural flexibility, fast growth, ensuring stability, resource scarcity, internal and external turbulence, managing paradoxes, and a volatile global environment (Hagen et al., 2024).

2.1.3 Relevance of organizational agility in project management

Organizational agility is linked to improved project performance (Oliveira et al., 2012). Oliveira et al. (2012) analyzed and found factors associated to organizational agility, which produces the maximum project performance, are continuous delivery, communication, people flexibility, team maturity, and continuous improvement.

According to PMI (2015) Organizations are increasingly viewing organizational agility as strategic competence. Agile alters your culture to allow team members to produce work and project managers to set direction (PMI, 2015). A culture of organisational agility which enables flexibility as well as the application of the correct strategy for the correct project is a crucial strategic competency in today's dynamic, ever-evolving market (PMI, 2015).

To increase organisational agility, project management gives organizations the ability to precisely define and track short-term outcomes that must be accomplished within a specified timeframe with the predetermined resources, as well as the flexibility to quickly adjust if necessary (Thiry, 2015).

While explaining the new logic of value creation, Fasnacht & Proba (2024) states that organizational agility allows organizations to respond swiftly to unexpected changes in project management. Fasnacht & Proba (2024) found that an organization's ability to adapt to its internal development procedures to align with market conditions.

Manurung & Kurniawan (2022) validated and confirmed through a Sobel test that organizational agility acts as a mediator in the relationship between organizational performance and networking capability, as well as between organizational performance and agile project management. Organizational agility serves as a crucial mechanism, encapsulating an organization’s dynamic capabilities to ensure swift and flexible responses to customer needs (Manurung & Kurniawan, 2022).

2.2 Agile project management

The concept of agility can be traced back to the 1930s, with Shewhart's work for quality improvement in a series of short "Plan-Do-Study-Act" cycles (Whiteley et al., 2021). They mentioned that after World War II, Toyota in Japan refined quality management principles, integrating them into its manufacturing systems.

Whiteley et al. (2021) also mentioned that incremental and iterative development was advanced in the 1950s and 1960s by NASA and IBM, with agile principles influencing military and project management standards in the following decades. By 2001, the significant role the agile manifesto played was to articulate the ideas that were already being practiced in many disciplines (Whiteley et al., 2021).

According to White (2008) agility in project management emphasizes characteristics of a sense of ownership and authority, the ability to implement quick and easy changes of direction, a resourceful and adaptable character, enabling projects to respond effectively to the dynamic demands of a business environment. Agile project management is an approach to managing projects that embraces continuous change, discovery, and learning throughout the project lifecycle to address the high levels of uncertainties associated with modern business projects, and it emphasizes adaptability and direct customer engagement (White, 2008).

Agile project management highlights factors such as flexibility, collaboration, and customer feedback (Binci et al., 2023). According to Binci et al. (2023) the key aspects of APM are interaction among team members, teams, clients during implementation, breaking down projects into smaller manageable iterations or sprints, combining exploration with exploitation, incorporating both vertical decision-making processes and shared leadership, ability to balance planned and emergent activities.

Dong et al. (2024) points out that agile has its roots in software development and it is understandable that early scholarly study primarily acknowledges and emphasizes the

concepts and methods unique to that field. However, it has become more applicable to the larger field of project management as agile has spread outside of the software development (Dong et al., 2024). Agile project management is not only an implementation of using scalable project components, but it also entails a more thorough incorporation of agile ideals and concepts into management culture (Dong et al., 2024).

According to Mergel et al. (2020), agile should be viewed as an adjunct to conventional organizational methods rather than as a substitute for them. Mergel et al. (2021) explain that, unlike traditional top-down decision-making procedures, agile encourages a mindset that emphasizes adaptation, reformation, and user involvement from the beginning. Agile may not simply replace traditional methods but rather demand a shift in organizational culture (Mergel et al., 2021).

2.2.1 Agile methods in project management

Scrum:

The term "Scrum" was first introduced in a 1986 Harvard Business Review article, where it was used as a metaphor for the collaborative efforts of small, high-performing teams in product development (Pope-Ruark, 2012). According to Hidalgo (2019) The Scrum framework is a popular method in agile project management that helps teams work together efficiently by breaking tasks into small task and short cycle durations called sprints. Key features of Scrum framework include freedom for teams, self-organization, overlapping phases for speed, multilearning, management established checkpoints, and sharing knowledge across the organization (Hidalgo, 2019).

Kanban:

Kanban first appeared through Toyota manufacturing, and later on it was adopted by software engineering in 2004, but due to its benefits Kanban has transcended its manufacturing roots and is widely used in various sectors (Ahmad et al., 2015). According to (Damij & Damij, 2021), the Kanban method is a powerful agile framework that enhances efficiency by focusing on visualizing workflow. The Kanban method emphasizes creating

a visual representation of the work process, setting work-in-progress (WIP) Limits to prevent bottlenecks, incremental improvement, flexibility, and adaptability by using simulation models to identify the best configurations (Damij & Damij, 2021).

Scaled agile framework (SAFe):

Scaled agile framework was introduced in 2011 as a solution to the growing need for integration and scalability of agile practices in large organizations (Turetken et al., 2017). According to Putta et al. (2018) the scaled agile framework (SAFe) is a methodology designed to scale agile practices across large enterprises. Putta et al. (2018) mentioned that the scaled agile framework (SAFe) integrates various agile practices from frameworks like Kanban, Scrum, Extreme Programming, and Lean. It is organized into four levels: program, portfolio, the team and value stream (Putta et al., 2018).

2.2.2 Benefits of agile project management

According to Gustavsson (2016), the benefits of agile project management extend beyond software development, impacting various sectors by enhancing teamwork, flexibility, customer interaction, and productivity. Gustavsson, (2016) mentioned that even in fields unrelated to software development, there is a great deal of interest in applying agile project management. Numerous articles were found that provided successful case studies of the application of agile project management (Gustavsson, 2016).

Ciric Lalic et al. (2022) researched project management approach and its relationship to project success, and found that agile approaches have been shown to positively influence the satisfaction and teamwork effectiveness, and future preparation to building capacities of projects. According to Ciric Lalic et al. (2022), projects managed with agile methods tend to foster better collaboration among team members. They also identified that agile project management contributes to building capacities in both organizational and technological infrastructure, and future preparation helps organizations improve their business success (Ciric Lalic et al., 2022).

Wisdom Ebirim et al. (2024) mentions collaboration, flexibility, and iterative development, which are emphasized in agile project management. Wisdom Ebirim et al. (2024) also mentioned that prioritizing adaptability in agile project management as it emphasizes the ability to adapt to changing customer needs and requirements. Agile approaches place a strong emphasis on flexibility and adaptability, which allow teams to change direction in response to market conditions and evolving requirements (Wisdom Ebirim et al., 2024).

According to Koch & Schermuly (2021) agile project management attracts potential employees and also enhances their commitment and satisfaction through psychological empowerment. Thesing et al. (2021) identifies that the biggest benefit of agile project management is its capacity to quickly identify changed requirements, as a result of frequent customer feedback. Additionally, the ability to promptly detect mistakes due to the short feedback and development cycles is regarded as a significant feature (Thesing et al., 2021).

2.2.3 Challenges of adopting agile methods

According to Serrador & Pinto (2015) agile shows stronger efficacy in industries like high technology, where IT and software have heavy use. Serrador & Pinto (2015) mentioned that even though agile approaches are still becoming more and more popular outside of software development projects, not much research has been done to determine whether agile projects are actually more successful.

According to Mishra et al. (2021), many large organizations face challenges when attempting to implement agile methods because, in very large-scale projects, the application space's complexity is usually beyond the expertise or experience. Ciric et al. (2019) mentioned a list of challenges of adopting agile methods beyond software development. According to Daraojimba et al. (2024) agile methodologies, while popular and effective in many scenarios, do have several challenges to adopt for organizations.

Table 1. List of the challenges of adopting agile methods from the literature.

Challenges to adopting agile methods
1. Management supports nonexistence (Mishra et al., 2021) 2. Large size of organizations (Mishra et al., 2021) 3. Traditional culture of the organization (Mishra et al., 2021) 4. Prioritization of work and alignment between stakeholders (Ciric et al., 2019) 5. Unpredictability in the delivery of business value (Ciric et al., 2019) 6. Client value visibility across all levels (Ciric et al., 2019) 7. Agile methods' incompatibility with organisational procedures and functions (Ciric et al., 2019) 8. Lack of strategy in project management (Ciric et al., 2019) 9. Lack of formal guidelines (Ciric et al., 2019) 10. Lack of standard processes (Ciric et al., 2019) 11. Longer feedback loops (Ciric et al., 2019) 12. Roles are not clearly defined of project team (Ciric et al., 2019) 13. Requirement of substantial cultural shift (Daraojimba et al., 2024) 14. Requiring a mindset change (Daraojimba et al., 2024) 15. Scalability issues of agile practices (Daraojimba et al., 2024)

Daraojimba et al. (2024) found that there are limitations and challenges to adopting agile methods in project management, but industries beyond software development, such as construction, healthcare, and finance, have successfully adopted agile approaches. The agile approach characteristics of adaptability, teamwork, and iterative development work especially well in an environment with unclear requirements or ones that change frequently (Daraojimba et al., 2024).

2.3 Embedding Agile in Traditional project management - Hybrid approach

According to (Cooper & Sommer, 2018), to address the need for a more fluid and adaptable system, leading manufacturing companies are moving to agile and hybrid models that combine agile and traditional approaches, such as agile-stage-gate. Agile methods are becoming more and more popular among organizations that previously used traditional approaches like the stage-gate approach to project management (Cooper & Sommer, 2018). Cooper & Sommer, (2018) mentioned that companies can leverage the advantages of both agile and stage-gate by implementing a hybrid model that incorporates aspects of both approaches. Cohn (2009) mentioned hybrid approach models and practices, such as the "waterfall-up-front", Scrum, and "waterfall-at-end" concepts, which attempt to combine traditional and agile management.

Project management theory typically categorizes approaches into waterfall, agile, and hybrid (Bianchi et al., 2022). According to Bianchi et al. (2022), fully adopting agile methods outside software development is often unfeasible due to organizational and contextual constraints. Combining practices has emerged as the solution, supported by studies highlighting agility's growing relevance in various fields, including manufacturing, regulated environments, technology companies, and consulting firms (Bianchi et al., 2022).

Copola Azenha et al. (2021) identified several types of projects that are suitable for hybrid management, including research and development of new technologies, development and implementation of products and services, projects focused on operational needs, new business models, and projects where changes of scope are required. To manage innovation projects, organizations employ hybrid, agile, and stage-gate models (Zasa et al., 2021). According to Cooper & Sommer (2018), the agile-stage-gate model is successfully applied in a variety of projects and industries. According to Conforto & Amaral (2016), hybrid project management can be modified for diverse projects to meet different needs in technology-based projects. For specific product development, stage-gate elements can be adapted, and then adding visual boards, iteration development, and

software for project management can be implemented (Conforto & Amaral, 2016). According to Adelakun et al. (2017), large organizations have adopted hybrid methods integrating agile with the waterfall method to manage a variety of software projects that may require both agile and traditional practices.

Copola Azenha et al. (2021) indicates that hybrid approaches are particularly effective in complex projects that require a balance between rigorous planning and flexibility. Koceska & Koceski (2022) mentioned that agile or traditional approaches are insufficient for complex projects that require both agility in the developing phase and planning in the front. The hybrid project management methodology, as an agile and waterfall combination, is useful and effective in circumstances such as the need for both agility and structure (Koceska & Koceski, 2022).

2.3.1 Hybrid methods

Reiff & Schlegel (2022) analyzed hybrid project management combinations and identified four hybrid methodologies: Waterfall-Scrum-Waterfall, Waterfall-Agile, Hybrid V-model, Agile-Stage-Gate. In addition to these methodical approaches, companies commonly integrate specific methods and procedures from various methodologies (Reiff & Schlegel, 2022).

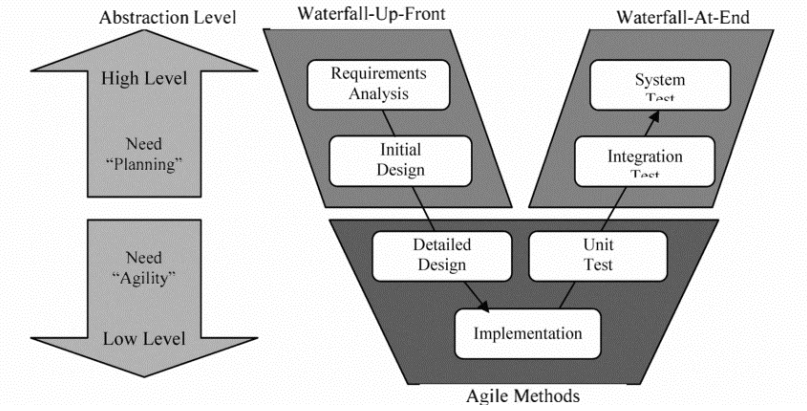

Figure 3. Hybrid V model for project management (Hayata & Han, 2011).

For hybrid project, Hayata & Han (2011) suggest a management model that incorporates aspects of both agile and traditional approaches. According to Hayata & Han (2011) this model applies the traditional approach to the project at the beginning and end; meanwhile, the agile methodology is used throughout the stages of design, implementation, and testing. As **Figure 3** shows, the lower levels in the V-model concentrate on agile approaches, whereas the upper levels in the V-model emphasize waterfall-based approaches (Hayata & Han, 2011).

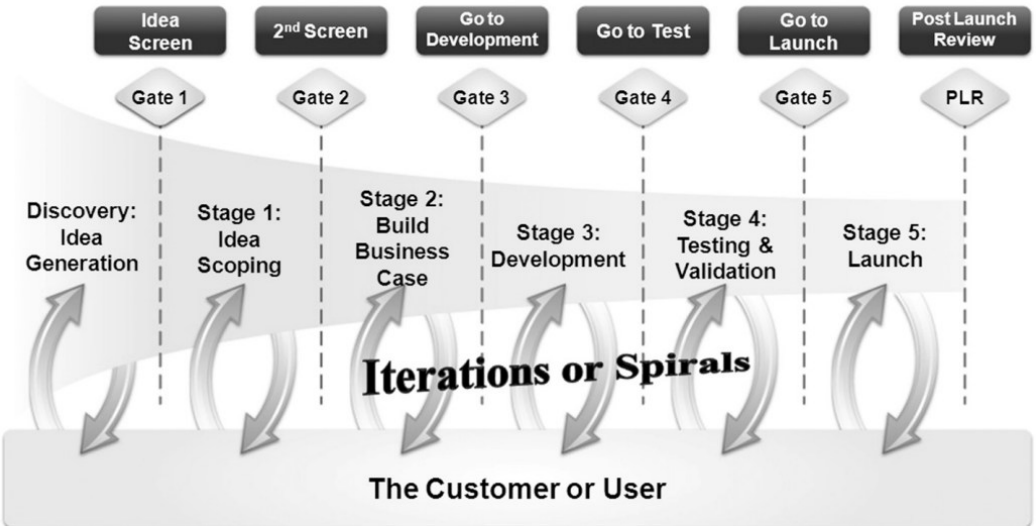

Figure 4. Agile-Stage-Gate methodology (Cooper, 2014).

Reiff & Schlegel (2022) state that the agile-stage-gate method divides the development process into short-term increments, incorporates agile sprints, and aims to increase speed and flexibility while keeping stage-gate's practical structures. Reiff & Schlegel (2022) mentioned that a sequence of time-boxed sprints makes up each stage, and every sprint starts with a sprint planning meeting where the project team establishes reasonable objectives for the sprint and then creates a plan of action to reach those objectives, as shown in **Figure 4**. The project is advanced tactically and operationally throughout the phases, while traditional and agile approaches operate concurrently in each step (Reiff & Schlegel, 2022).

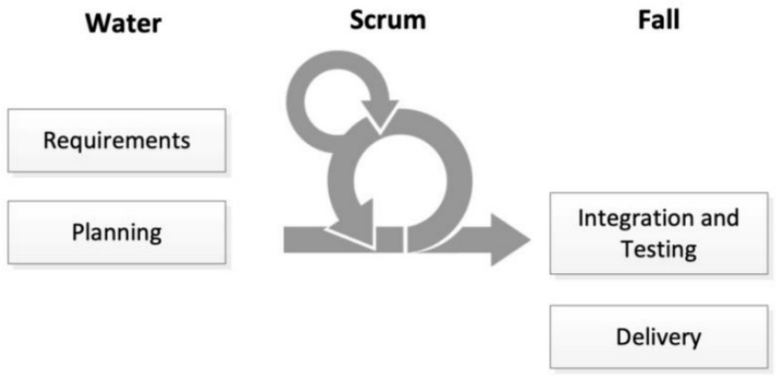

Figure 5. Water-Scrum-Fall model of hybrid project management (Wysocki & Orłowski, 2019).

West (2011) introduced Water-Scrum-Fall to characterize a typical situation where the rest of the organization continues to use the traditional waterfall methodology while a team adopts the agile scrum methodology. **Figure 5** illustrates this scenario where the water phase describes upfront work, in the middle is the scrum methodology for development, then the fall refers to the establishing gates phase (West, 2011).

Brandl et al. (2018) described hybrid project management approach as the integration of an agile approach into existing traditional project management methodologies. According to Brandl et al. (2018) for certain project components, organizations combine elements of the agile methodology with their traditional approach. Combining the best features of both approaches, the project management methodology can be tailored to the needs of each part of the project (Brandl et al., 2018).

2.3.2 Benefits of the hybrid project management approach

The key advantage of hybrid management is its ability to address uncertainties, risks, and constant changes while aligning with business processes and organizational culture (Copola Azenha et al., 2021). There is enough proof to suggest that, in some circumstances, hybrid project management models can outperform purely agile or traditional approaches (Bianchi et al., 2022).

Conforto & Amaral (2016) outlines that beyond the software industry, technology-based product development projects are benefited by combining different project management approaches. Conforto & Amaral (2016) found that the hybrid framework contributed to numerous aspects of project and product development performance which are commitment, information accuracy, and leadership. Team members collaborate more when they use stage-gate components with regular discussions such as daily scrum, visual tools like visual boards, and project management software (Conforto & Amaral, 2016).

Koceska & Koceski (2022) mentioned that hybrid project management combining agile and waterfall has benefits like compatibility, clarity of responsibilities, detailed planning, and flexibility. According to Koceska & Koceski (2022), hybrid project management combines the strengths of agile and waterfall, offering versatility for teams across industries and It ensures clear responsibility allocation and project mapping, enabling stakeholders to track progress and identify next steps easily. The hybrid approach supports thorough planning, with accurate cost estimates and structured deliverables with flexibility that allows teams to adapt quickly to changes during development (Koceska & Koceski, 2022).

Hybrid project management offers significant benefits by blending elements of traditional and agile methodologies (Bianchi et al., 2022). Bianchi et al. (2022) mentioned that the hybrid approach is particularly effective in managing projects characterized by both predictability and adaptability, such as hardware-software integration projects and this approach enables organizations to navigate high uncertainty environments by allowing iterative evaluations and necessary adjustments to deliver value to clients. According to Bianchi et al. (2022) the balance between structured planning and agile flexibility supports diverse project needs, improving overall performance. Hybrid methodologies align with the growing consensus that a one size fits all approach is inadequate for addressing the unique demands of various industries and projects (Bianchi et al., 2022).

2.3.3 Challenges of the hybrid approach

According to Conforto et al. (2014) agile project management implementation into traditional industries presents several challenges. Adopting a hybrid model is challenging since it necessitates a precise alignment of the organizational objectives, project implementation, and project team (Zasa et al., 2021). There are challenges in creating hybrid frameworks and implementing agile practices into other industries (Conforto & Amaral, 2016).

Table 2. List of challenges of the hybrid approach in project management.

Challenges of hybrid approaches
1. Difficulty assigning full-time project teams (Conforto et al., 2014)
2. Co-locating the team members (Conforto et al., 2014)
3. Forming multidisciplinary teams (Conforto et al., 2014)
4. Limited customer involvement (Conforto et al., 2014)
5. Superficial supplier collaboration (Conforto et al., 2014)
6. To understand and properly identify the crucial conditions in the characteristics of the team, project, and the organization (Conforto & Amaral, 2016)
7. Diverse planning cycle (Zasa et al., 2021)
8. Management doubt (Zasa et al., 2021)
9. Companies struggle with producing cultural change (Zasa et al., 2021)
10. External suppliers involved constraints (Zasa et al., 2021)
11. Lacking support for committed teams (Zasa et al., 2021)
12. Department's inexperience with agile working methods (Zasa et al., 2021)
13. Required to choose and use appropriate tools correctly (Reiff & Schlegel, 2022)
14. high level of communication and transparency (Reiff & Schlegel, 2022)
15. Teams need thorough methodological knowledge (Reiff & Schlegel, 2022)

2.3.4 Enablers and key factors for effective agile integration

According to Brandl et al., (2018) there are systems that enable hybrid process models in innovation projects to be effectively implemented in a manufacturing setting, and there are important factors for a hybrid integration and better agility. Zasa et al. (2021) states that three factors need to be carefully considered for agile to be successfully integrated into traditional project management (stage-gate). Conforto et al. (2014) identified several enablers for agile project management implementation.

Table 3. List of Enablers and key factors for effective agile integration.

Enablers and key factors for effective agile integration
1. Innovation objective (Brandl et al., 2018)
2. Agility assessment (Brandl et al., 2018)
3. Project scaling (Brandl et al., 2018)
4. Resource systems (Brandl et al., 2018)
5. Tool support (Brandl et al., 2018)
6. Performance report (Brandl et al., 2018)
7. Giving authority to project teams (Brandl et al., 2018)
8. Offer an independent work environment (Brandl et al., 2018)
9. Promoting entrepreneurial mindsets (Brandl et al., 2018)
10. Analogue and multidisciplinary work culture (Brandl et al., 2018)
11. Incorporating a useful failure management system (Brandl et al., 2018)
12. Setting up a performance measurement mechanism (Brandl et al., 2018)
13. Introduction of agile gradually (Zasa et al., 2021)
14. Agile methods' usability (Zasa et al., 2021)
15. Culture of the organisation (Zasa et al., 2021)
16. Experience of the project manager (Conforto et al., 2014)
17. Size of the project team (Conforto et al., 2014)
18. Location of the project team member (Conforto et al., 2014)

2.4 Theory of Constraints

Theory of constraints is a concept of project management which was introduced primarily by Dr. Eliyahu M. Goldratt, and it spread through the novel The Goal (Goldratt & Cox, 1984). The fundamental belief of the theory of constraints is that a system's capacity is dictated by a limited number of limitations or constraints, and managing these limitations becomes especially important when managing a system (Apaolaza et al., 2020).

According to Şimşit et al. (2014) instead of considering processes to be independent of one another, TOC sees them as rings in a single chain. The theory of constraints focuses on the company's weakest areas or bottlenecks, and tries to figure out how these bottlenecks relate to one another (Şimşit et al., 2014).

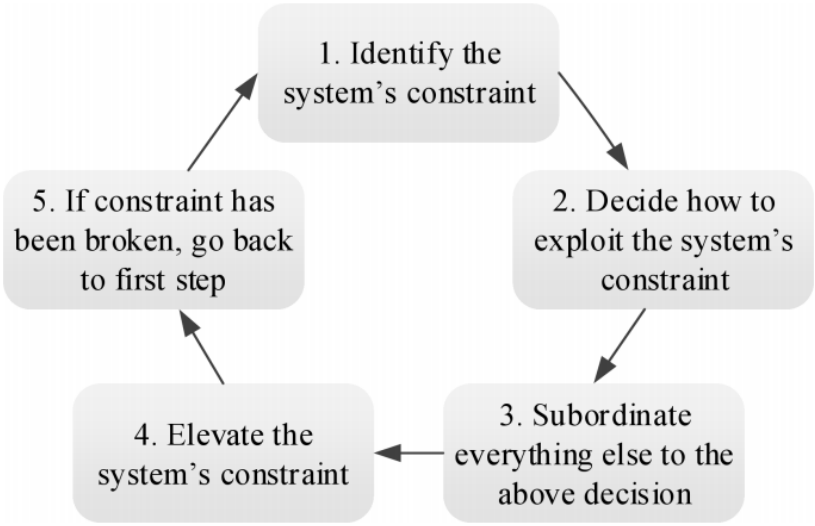

Figure 6. Five steps of the Theory of Constraints (Trojanowska & Dostatni, 2017).

The theory of constraints and its five fundamental steps were introduced by Dr. Eliyahu M. Goldratt in his book The Goal (Goldratt & Cox, 1984). As shown in **Figure 6** Mishra (2020) mentioned the five fundamental steps to eliminate constraints in project management are identifying the constraint, exploiting the constraint, subordinating to the exploitation, improving the system performance, and repeating the process.

According to Trojanowska & Dostatni (2017) to strengthen the constraint, the theory of constraints allows investments that will improve the constraint and help increase the system's overall efficiency. As a result of the continuous improvement of constraints performance, the constraint can be overcome (Trojanowska & Dostatni, 2017). Ifandoudas & Chapman (2009) found that according to reports, implementing the theory of constraints can result in reduced lead and cycle times, decreased inventory, and increased quality and productivity.

2.4.1 Relevance of TOC to balance agile integration in traditional approaches

According to Apaolaza et al. (2020) the theory of constraints is also the foundation of the Kanban project management methodology, which is an agile approach to project management. Apaolaza et al. (2020) mentioned that the works made by the proponents of the Kanban approach to project management clarify that it shares some traits with the theory of constraints. Apaolaza et al. (2020) state agile approaches share the need for flexibility and adaptability to changing needs, but they are less prescriptive than traditional approaches. Agile approaches have a clear focus on short-term project execution management (Apaolaza et al., 2020).

Agile approaches emphasize embracing uncertainty, which sets them apart from traditional project management techniques (Serrador & Pinto, 2015). In TOC specific methods, buffers are an essential part of the solution, and they act as a mechanism for performance monitoring and offer protection against uncertainty (Apaolaza et al., 2020).

Ifandoudas & Chapman (2009) mentioned that from a strategic view of agility, the five-step process of TOC can be used to enhance resources that have been identified as essential to maintaining the company's competitiveness before they become bottlenecks. This procedure offers a strategic plan for ongoing improvement in addition to broadening the scope of TOC (Ifandoudas & Chapman, 2009).

In a research on combining plan-driven and agile methodologies, Mirzaei et al. (2024) mentioned about constraints and stated that a hybrid-by-phases approach, in which the project manager's control and responsibility are limited to particular constraints through each phase, is more appropriate for project management success. This hybrid approach enables the project manager to focus on particular constraints through each phase by facilitating decision-making with the participation of stakeholders at the start of each phase (Mirzaei et al., 2024).

2.4.2 TOC's applicability with traditional, agile, and hybrid approaches

The theory of constraints emphasizes the constraints preventing the project's goal from being accomplished (Wei et al., 2002). Theory of constraints is a project management and planning tool that can be applied to both single-project and multi-project structures, when resources are put to use in multiple projects at once (Izmailov et al., 2016).

Promoters of the theory of constraints claim that traditional project management often includes excessive contingency provisions due to overly conservative time estimates and multiple layers of reserves added by team members and managers (Steyn, 2002). This practice can lead to wasted time, and the theory of constraints addresses these inefficiencies by integrating resource availability into scheduling and placing feeding buffers where non-critical paths intersect the critical chain (Steyn, 2002).

Steyn (2002) mentioned that to manage resources in traditional project management, the five-step TOC approach involves finding the resource that limits capacity, scheduling capacity resources, adjusting other resources to fit this schedule, and using buffers to prevent delays in the process. Before adding new resources, it's important to first use existing ones effectively and check if the current resource is still a constraint, ensuring all resources under pressure are managed properly (Steyn, 2002).

The TOC perspective is a useful strategy for developing into an agile manufacturer, and an agile strategy can be accomplished by implementing the theory of constraints as a

method of continuous improvement (Ifandoudas & Chapman, 2009). The TOC five-step process and the identification of critical resources can be used in tandem to accomplish the strategic side of agility (Ifandoudas & Chapman, 2009). According to Ifandoudas & Chapman (2009), agile principles can be adopted to enable a business to modify its internal resources as well as its behaviour in the marketplace. Flexibility, which is essential to the operational feature of agility, is driven by an understanding of the constraint and the capacity to elevate and exploit it (Ifandoudas & Chapman, 2009).

Pegels & Watrous (2005) states that bottlenecks are the source of disruption in any attempt to increase productivity and efficiency, and the TOC principle states that bottlenecks should be identified and the focus of attention should be on them. According to Pegels & Watrous (2005) significant improvements will naturally occur when bottlenecks are removed from any operation. Identifying the bottleneck and taking the appropriate steps to remove it is the relatively straightforward TOC approach (Pegels & Watrous, 2005).

According to Sheshasaayee & Vijaykumar (2015) In agile projects, TOC principles are applied to find potential bottlenecks. By creating brief time boxes known as iterations, the majority of agile approaches aim to reduce risk in project management (Sheshasaayee & Vijaykumar, 2015).

Iterations in the agile-stage-gate model, which is a hybrid approach described by Cooper (2014) include sprints and scrums, which are brief time-boxed increments where the deliverables can be shown to stakeholders instead of documentation. Developments to show the client as a quick prototype, a rough working model, or an early beta version at each iteration (Cooper, 2014). By identifying bottlenecks in each iteration, possible issues with agile implementations can be reduced, and the primary idea behind TOC is to identify and take advantage of bottlenecks (Sheshasaayee & Vijaykumar, 2015).

2.5 Research Framework

The conceptual framework for this study is built on three interconnected stages: inputs, processes, and outputs. In the early phase of this framework, agile methods and practices are introduced in traditional project management. Theory of constraints role is to identify organization's constraints (Pegels & Watrous, 2005). Zitkiene & Deksnys, (2018) mentioned agility from the viewpoint of enablers that can help organizations attain agility. In this conceptual framework, the agile integration processes involve a series of actions: evaluating current project management practices, identifying and resolving constraints using the theory of constraints, embedding agile methods and practices into the traditional framework, agility enablers to enhance organizational agility, and developing and implementing a hybrid project management approach.

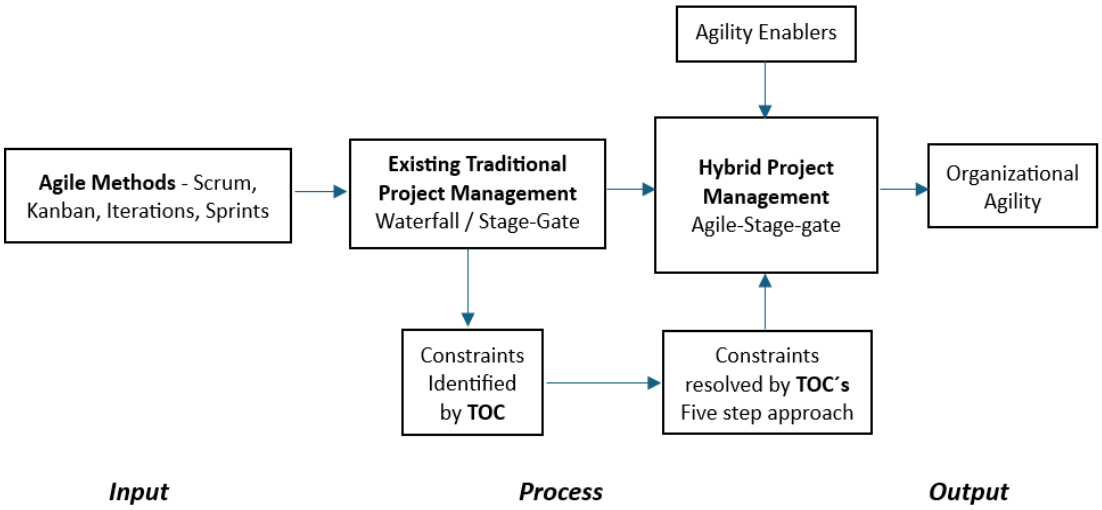

Figure 7. Conceptual framework of embedding agile methods in traditional project management.

Components of the framework are agile project management methods, existing traditional project management practices, enablers of agility, and the theory of constraints. These processes are designed to facilitate the integration of agile with traditional practices. The output of this framework is enhanced organizational agility through efficient management of constraints, collectively contributing to improved project management.

3 Research Methodology

A general research plan that outlines the appropriate method to do research is the research methodology (Melnikovas, 2018). Saunders et al. (2023) proposed a concept that is a “research onion” to construct a research methodology that consists of six layers. The research Methodology adopted for this study is designed according to Saunders et al. (2023) “research onion” concept that intends to outline the philosophical stance, research approach, choice of methodology, research strategy, time horizon, data collection techniques, and data analysis methods. The selection of each methodological aspect is justified with relevant theoretical foundations and practical considerations of this study.

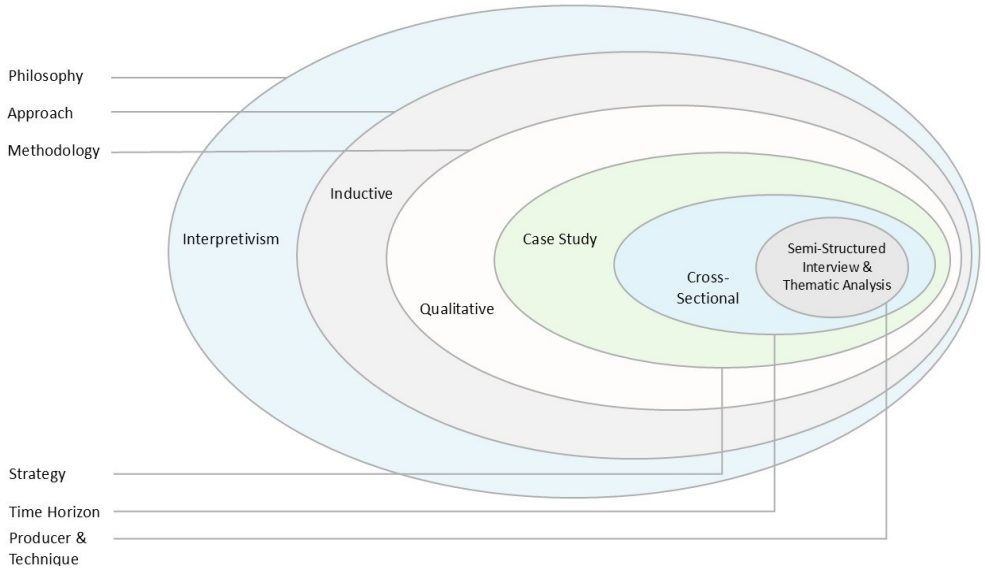

Figure 8. Research Onion (Saunders et al., 2023).

The research onion presented in **Figure 8** illustrates the layered structure of the research methodology for this study of embedding agile management practices in traditional project management. At the outermost layer, the research philosophy follows interpretivism. Moving inward, the approach adopted is inductive, the methodology is qualitative, the chosen research strategy is a case study, the time horizon is cross-sectional, and the data collection and analysis techniques involve semi-structured interviews paired with Thematic analysis.

3.1 Research Philosophy

The research philosophy adopted in this study is Interpretivism. Interpretivism is a research philosophy to develop fresh, deeper insights into organizational realities (Saunders et al., 2023). In this study, the interpretivism philosophy aligns well to have a deeper insight into the agile integration strategy within a traditional project management environment. According to Saunders et al. (2023) the actual experiences and cultural objects of individuals are the empirical focus of interpretivists, who aim to incorporate both their own and their participants' interpretations into their studies. Interpretivism refers to a usually inductive way of research with fewer samples, in-depth research, and qualitative analysis techniques, yet a variety of data can be interpreted (Saunders et al., 2023). Since this study aims to explore how agile practices can be embedded within traditional project management in the case company, it is essential to understand the perspectives of project management professionals from the case organization. Interpretivism aligns with this goal in this study by facilitating in-depth exploration of participants' experiences and interpretations, thus providing rich insights.

3.2 Research Approach

This study follows the inductive approach, where themes related to the challenges and strategies to embedding agile practices in the case organization are found in the thematic data analysis. Using an inductive technique, research begins with data collection to investigate a phenomenon and develop or construct a theory, frequently in the format of a conceptual framework (Saunders et al., 2023). Saunders et al. (2023) mention that the inductive approach refers to investigating a phenomenon, finding themes and patterns, establishing a conceptual framework, and collecting data. The inductive approach is more suited to research a small sample of subjects rather than a huge number, and it is more common for researchers in this approach to use qualitative data (Saunders et al., 2023). In this study, data gathered from semi-structured interviews are analysed to develop themes and draw conclusions regarding the challenges and integration strategies of agile practices within traditional project management.

3.3 Methodological Choice

This study implements a qualitative methodology, which is appropriate as the study's focus is on understanding complex challenges and strategies of the case organizations' agile integrating methods, the experiences of transitioning from traditional to agile practices, perspectives of constraint management, enhancing organizational agility, and contextual factors of hybrid project management. According to Saunders et al. (2023) qualitative research is used to construct theory or create a more comprehensive theoretical perspective than is already available in the literature, and qualitative research frequently employs an inductive strategy for theory creation. Qualitative research examines participants' meanings and connections to produce a conceptual framework using methods such as semi-structured interviews and related qualitative analysis methods that can be used in a qualitative research design (Saunders et al., 2023).

3.4 Research Strategy

In the study, the research strategy is a case study strategy to find the insights, challenges, and strategies for the case organization on agile management practices with traditional project management. According to Saunders et al. (2023) through a case study strategy, Insights from the thorough in-depth investigation into a phenomenon in its actual setting can be produced, which can result in detailed empirical descriptions. The case study strategy here in this research intends to explore into the practical aspects of embedding agile practices within the traditional management settings of the studied organization. This approach allows for capturing contextual factors of the hybrid type of project management, challenges of agile practices, and practical solutions to constraints in the case organization. A case study research strategy, which frequently uses qualitative data via a variety of sources, can be used to determine what happened and why, as well as to comprehend the situation's implications and consequences for action (Saunders et al., 2023).

3.5 Time Horizon

The time horizon adopted for this research is cross-sectional. In this study, research is conducted to observe the case organization's current transition from traditional to agile management practices, challenges associated with integrating agile methods, and the case organization's project management approach within the hybrid project management context. According to Saunders et al. (2023), cross-sectional research involves examining specific occurrences at a certain moment in time, and it can attend to a wide range of tactics and study designs, including mixed, quantitative, and qualitative methods. Qualitative data can be applied in cross-sectional studies (Saunders et al., 2023).

3.6 Data Collection and Analysis

Data for this study have been collected through semi-structured interviews, and thematic analysis has been used to analyze the interview transcripts. Semi-structured interviews use a list of pre-established themes and opening questions to conduct each interview and gather information to address a research topic or answer the research question (Saunders et al., 2023). According to Saunders et al. (2023) semi-structured interviews can gather information on a certain subject with questions more organized around various theoretical sides to support the formation of theories and qualitative data. Thematic analysis is frequently seen as a generic analytical technique or procedure that uses coding processes to create patterns of meaning, and this is a general systematic method of qualitative data analysis (Saunders et al., 2023). The semi-structured interviews for this study are designed to gather insights into the case organization, on how agile practices are being implemented in traditional project management settings, and the challenges encountered during this process. The data analysis process for this study involves familiarization with semi-structured interview data, theme development, theme description, and interpretation. By using thematic analysis, this study intends to identify key themes of the case organization related to challenges and strategies of embedding agile practices in traditional project management.

4 Data Analysis and Findings

4.1 Data analysis of research question 1.1

RQ 1.1: What challenges might arise when integrating agile methodologies into existing project management?

To investigate **RQ 1.1**, the themes in **Table 1** have been analysed through the semi-structured questions.

Table 4. Semi-structured interview questions and themes for research question 1.1.

Semi-structured interview question – RQ 1.1		Themes
1	How do existing workflows in your organization challenge the adoption of agile practices?	Rigid workflows
2	What are the particular challenges in managing complex projects using a hybrid model?	Complex project-specific challenges
3	What resistance or concerns have you observed from team members when agile practices are introduced into a traditionally managed project?	Resistance to change
4	What are the constraints you faced when applying the agile approach to traditional project management?	Constraints with agile practices
5	How do you ensure customer and stakeholder involvement in hybrid projects?	Customer and stakeholder involvement

4.1.1 Analysis of rigid workflow and adoption of agile practices

The existing workflow in the case organization presents several significant challenges to the adoption process of agile practices because of the former traditional processes, structure, and cultural resistance. According to Interviewee A & E, the legacy of waterfall-style project management is inconsistently applied till today and still influences the mindset of team members in the company. Interviewees described that their organization is in a transition and struggling with the agile implementation, particularly as the

agile principles are not yet fully understood by all teams. Interviewee D & C mentioned that another key challenge is the disconnect between internal agile aspirations and external or partner workflows. According to Interviewees, many of their externals continue to follow the traditional approach. Interviewee C mentioned that it is challenging to practice agile management without a dedicated internal agile team and emphasized that reliance on external partners can hamper agile practices. Interviewee E mentioned the complexity of their large, historically project-driven organizations, established practices create resistance against the current transformation in the case organization.

Table 5. Interviewee quotes on rigid workflow and adoption of agile practices.

Interviewee	Interviewee quotes
Interviewee A	*"Although we had the kind of waterfall way of working before. But it wasn't really a good waterfall project management."* *"We are, I would say, the beginning of the journey... the theory is done. But now we need to start to implement that."*
Interviewee B	*"This transfer is in progress at the moment."* *"We need to clarify all those terminology... because otherwise people can't follow the actual way of working if they don't understand the big picture."*
Interviewee C	*"One big, big challenge in our organisation is that we are using a lot of externals like designers and engineers."* *"Not having a dedicated team, maybe that's the biggest. That was the biggest obstacle for first."*
Interviewee D	*"Roles and responsibilities that are not clear... we still have our roles from the old world... and on top of that we're kind of putting the agile responsibilities."*
Interviewee E	*"Historically it's a project-driven organisation... we have delivered so many different products around the years... we can't forget them…and they have developed their way of working."*

4.1.2 Analysis of challenges in managing complex projects

Managing complex projects in the case organization using a hybrid model reveals challenges related to mindset shifts, unclear roles, and mismanagement. Both Interviewee A and Interviewee B emphasized that team members' mindsets adapting from a traditional hierarchical model to a more autonomous agile way of working is a major hurdle for them. Interviewee B mentioned that team members expect to be told what to do, which leads to misunderstandings about ownership and delivery timelines in the company. These views express the difficulty of fostering agile practices in the case company. Interviewee D mentioned growing dependencies and iterative development disrupting schedules. Interviewee E mentioned the challenge of defining stakeholder-specific requirements and maintaining alignment with an overarching roadmap. Meanwhile, Interviewee C mentioned many large-scale initiatives are misclassified as projects when they should be programmes and suggested that smaller, sub-projects may allow for more effective application of agile within a hybrid framework in the case company.

Table 6. Interviewee quotes on complex project challenges using hybrid methods.

Interviewee	Interviewee quotes
Interviewee A	*"The mindset is the first thing to adapt... people to understand their role... What does it mean in practical in my ways of working? What should I do? What is my responsibility?"* *"Some have a very good understanding of agile and some not... it goes very easily to the old model."*
Interviewee B	*"Now you have to do it by yourself and that is a big issue... most people are waiting for someone to say now you need to do this and that."*
Interviewee C	*"Many of these very big complex projects should actually have been programmes... where you have a programme manager and multiple smaller projects."*

Interviewee	Interviewee quotes
Interviewee D	*"Understanding when the complexity is increased and the dependencies of different aspects... what needs to be done before something else can be delivered."*
Interviewee E	*"The very first challenge is to define what do you want to achieve with your project in a clear, concise way understandable by every stakeholder."*

4.1.3 Analysis of team members resistance to change

There has been some resistance and concerns from team members when agile practices are introduced into traditionally managed projects in the case organization. A common theme across several interviews was the perception of micromanagement. Interviewee A mentioned that agile ceremonies like daily stand-ups are often misunderstood as micromanagement by their team members. Similarly, Interviewee C mentioned that because of the increase in meetings and formal ceremonies, they feel excessive to some team members, especially when agile is implemented rigidly. A lack of understanding of agile principles was also identified as a cause of resistance in the case organization. Interviewees D and E mentioned about their role confusion and task overload. Interviewee D explained that during the transition period, team members often feel they are expected to perform both traditional and agile tasks simultaneously. Interviewee E mentioned the discomfort of change, particularly when previous methods are perceived to be effective in the case organization.

Table 7. Interviewee quotes on team members' resistance to change**.**

Interviewee	Interviewee quotes
Interviewee A	*"We have this more kind of the stand-ups and to kind of tell what you have done and what you're going to do next. So people are kind of feeling that this is micromanaging."*

Interviewee	Interviewee quotes
Interviewee C	*"If you get too many meetings... and people are there, and they are a bit like wondering that, ok, why am I here? What's the purpose of all this?"*
Interviewee D	*"You're just kind of adding tasks on top of your lists and not really changing the way it works… Resistance comes more... from the feeling that you need to commit to more tasks than before."*
Interviewee E	*"The biggest resistance I think is that why do we have to do it differently?"*

4.1.4 Analysis of constraints while applying agile methods

Interviewees identified a common constraint in the case organization, that is the lack of synchronization in mindset and workflows between different departments or external partners. Interviewee A mentioned they have difficulty in aligning various departments with the agile mindset due to the absence of a unified training strategy. Interviewee B mentioned that third-party teams are unfamiliar with agile tools and communication styles in the company. Interviewee E mentioned that agile principles clash with traditional practices that lack feedback mechanisms in their company. Interviewee C mentioned that they have some external dependencies, which often override agile's iterative nature in their organization. This reflects a limitation where traditional project schedules influence the case organization and limit the flexibility of teams. Interviewee D mentioned they have a lack of expert agile personnel who are overloaded with multiple initiatives across many projects. The constraints in applying agile methodologies in this case organization are found rooted in the case organizations misalignment, resource limitations, and dependency issues.

Table 8. Interviewee quotes on constraints in applying agile methodologies.

Interviewee	Interviewee quotes
Interviewee A	*"So that's kind of a little bit constrained at the moment that they are in this, not in the same mindset, what we are driving."* *"Getting the agile Training at the moment because it has been really that in in different groups and we don't have the clear kind of plan"*
Interviewee B	*"When we working with some of the projects we will have also some third parties... they can be really totally different way of working."*
Interviewee C	*"In agile you would try to do this projection... but of course in this bigger projects usually somebody has already decided the deadline."*
Interviewee D	*"Our technology organisation is now very lean... only one expert for a certain area and he or she needs to be involved in basically everything."* *"Calendar full of different meetings. And then on top of that, you actually have to do the actual work."*
Interviewee E	*"Mechanical and process design... that is total design for which there are no way of working at all…it is working in one part of the organisation, but it may not be working on the other part."*

4.1.5 Analysis on customer and stakeholder involvement

There are some structured mechanisms in the case organization, such as incremental planning sessions, sprints, and feedback loops. Most interviewees mentioned of using increment-based planning in their company. According to the interviewees, in their company, stakeholders engaged in setting expectations and reviewing outcomes every three months, with each increment typically divided into three sprints. However, a critical concern expressed by multiple interviewees is the insufficient direct dialogue with end customers. Interviewee A mentioned that the existence of high-level stakeholder meetings

involving sales, delivery, and engineering, but noted a lack of dialogue at the technical team level. Interviewee B strongly criticized the almost complete absence of end-customer involvement in their organization. Similarly, Interviewee D recognized sales plays as a substitution for customer input but admitted that the involvement of external stakeholders is often missing. Interviewee E explained that planning and demo sessions now involve multiple internal stakeholders from different functions, but admitted that customers still remain excluded from the organization.

Table 9. Interviewee quotes on customer and stakeholder involvement.

Interviewee	Interviewee quotes
Interviewee A	*"We are having a session with our stakeholders with sales and project delivery and engineering... but it's very high level."* *"We should have more dialogue with our stakeholders... we are just talking about stakeholders in the management level."*
Interviewee B	*"Dialogue between the end customer and the product development… it is not like as it should be."*
Interviewee C	*"That's a big problem in corporations — one part is doing things and others don't know about it."*
Interviewee D	*"You need to understand who your customer is... I would maybe consider here that it's the sales."* *"They bring us the actual requirements... then we will try to understand: is this one customer-specific or a market need?"*
Interviewee E	*"At the start of each increment, there is a planning session where all of the stakeholders come together... but not external customers."*

4.2 Data analysis of research question 1.2

RQ 1.2: What best practices and strategies can be employed to ensure successful integration of agile practices?

To investigate **RQ 1.2**, the themes in **Table 7** have been analysed through the semi-structured questions.

Table 10. Semi-structured interview questions and themes for research question 1.2

Semi-structured interview question – RQ 1.2		Themes
1	What steps has your organization taken to integrate agile methods into existing traditional workflows?	agile integration strategies
2	How you ensure successful integration of agile practices?	commitment to agile integration
3	How have agile practices influenced the way your team achieves project goals?	Influence of agile integration
4	What traditional project management practices do you believe are essential and should not be replaced by agile methods?	Essential traditional practices
5	In your opinion, what are the key enablers of agility within a hybrid project management approach?	Agility enablers
6	How do you ensure that your organization remains adaptable to changes in project requirements or market demands?	Organizational agility enhancement

4.2.1 Analysis on agile integration strategies

From the data it has been found that interviewees emphasized on agile understanding, gradual increment, management support, dedicated team, structural and cultural shifts in their workplace as strategic enablers of this agile integration process. Interviewee A mentioned that they are implementing agile ceremonies, support systems, and leadership transformation. Interviewee B highlighted that only implementing the ceremonies does not make their team agile; instead, they need gradual increment, more team engagement, and mindset transformation. Interviewee C spoke of strategies such as the planning days and a transition from project-based to product-based models. Interviewee

D highlighted the role evolution from traditional project managers to agile coaches and supports agile as part of the strategic agenda. Interviewee E mentioned they intend to practice a structured educational approach, including sessions, role clarification, manuals, and pilot projects to test agile workflows in both development and maintenance in the organization.

Table 11. Interviewee quotes on agile integration strategies.

Interviewee	Interviewee quotes
Interviewee A	*"We have the theory... we share what are the ceremonies. We have the product owners in place and an actual office kind of supporting the actual where you're working."* *"Our management has been really kind of promoting the agile way of working... they have a crucial role."*
Interviewee B	*"We are halfway…the challenges that if we just implementing those ceremonies in place, it is not agile at all."* *"we need a lot of discussion and dialogue in the team"* *"This is a marathon. This is not the Sprint at all."*
Interviewee C	*"We have this sort of planning days now once per quarter… to ensure internal capacity and resolve conflicts."* *"We are trying to go from a project-based model into a product-based model."*
Interviewee D	*"There used to be project managers doing the product development… now more like agile coaches."* *"It's in our strategy really to move to this agile way of working… we have planning days for the whole organisation."*
Interviewee E	*"The first and foremost step… was to educate people to create awareness…They have created a manual or workbook… list down all the guidelines."*

Interviewee	Interviewee quotes
	"They have done some pilot… to test that concept on a very small scale…Next plan is to take this workflow to the shared teams… like supply chain or supplier development."

4.2.2 Analysis on commitment to agile integration

Among interviewees, it has been found that the importance of creating understanding and alignment across the teams. Interviewee A emphasized that in their company, people need to understand the personal benefits of change, what it brings to them. Measurement and tracking tools were also common points of discussion in the interview. Interviewees B and C both emphasized measurement tracking mechanisms to ensure agile integration. Interviewee B highlighted measurement tools to evaluate team effort beyond velocity. Interviewee C explained a detailed example of how their tools, like velocity, cost tracking, and percentage completed, are used to monitor progress effectively in the case organization. Interviewee C also explained that the agile way gives clearer progress indicators than traditional Gantt charts. Interviewee D emphasized on collaboration, communication, and visibility of their work. Interviewee E focuses on organizational engagement through gradual scaling of demo sessions, from small internal teams to the entire organization, as a way to foster widespread involvement in their organization.

Table 12. Interviewee quotes on commitment to successful agile integration.

Interviewee	Interviewee quotes
Interviewee A	*"People need to understand… what this change brings to me, what I'm going to gain from this change from my perspective."* *"We need to create that atmosphere that yes, you are able to do your work. You are able to finish things."*
Interviewee B	*"One thing to add is maybe measurements… how to measure the actual way of working and how to get the data about these changes as well."*

Interviewee	Interviewee quotes
	"Velocity is something, but we need to also think about how to measure, for example, team effort—how we can see it in practice."
Interviewee C	*"We can calculate the velocity of the team."* *"We follow the percentage complete… and we tried to have it always over 80%."* *"In agile… the task is either completed or not completed. That's a much better way to follow progress."*
Interviewee D	*"It's crucial in the agile way of working—this kind of frequent collaboration and communication…I try to make my work visible… so that others also know what's going on."*
Interviewee E	*"One of the matters they have been focusing on is the engagement of the organisation…When we do the demo session… it was extended… and then it was taken to the whole organisation."*

4.2.3 Analysis of the agile integrations influence in achieving the project goal

Most interviewees acknowledged their shift from traditional to agile, more team-involved decision making in their organization. Interviewee A mentioned that agile practices brings a shift in mindset in their company, and teams are now more conscious about goals. Interviewee B mentioned that though project requirements might not always be as thoroughly defined upfront, careful planning of resources and capacity in agile is very important. Interviewee C highlighted that they are inviting team members on planning responsibilities, from a project manager to individual team members in their company. This is believed to give better clarity and more effective execution. Interviewee E mentioned that regular stand-ups in their company enhances transparency and responsiveness to shifting market demands and internal challenges. According to Interviewee E, these meetings help identify bottlenecks early and align team efforts with evolving priorities. Interviewee D expressed some difficulties in adopting agile due to workload overlap and role confusion in their organization. According to interviewees, some team

members are found to be viewing agile ceremonies as an additional burden. The integration of agile practices in the case organization has notably influenced how their teams approach and achieve project goals.

Table 13. Interviewee quotes on the influence of agile on achieving the project goal.

Interviewee	Interviewee quotes
Interviewee A	*"Before... people were just doing some kind of go... they didn't think that through... Now it's really more of use that people need to think what they are going to deliver... It has brought more focus now definitely... It has brought more visibility about our resources."*
Interviewee B	*"We need to be aware that the planning is correct... how we're planning resources, how we're planning capacity... those are the questions what needs to be more clear than before."*
Interviewee C	*"We are now involving the team to do the planning instead of trying to hand it over and then expect perfect results... you focus on team building and ownership of the work... the biggest difference... is the mindset."*
Interviewee D	*"Agile ceremonies seem like an extra effort... because I still need to deliver work... So that's the hard reality."*
Interviewee E	*"When you have the stand-up meetings... you get the transparency that hey, if somebody is having some issues...product owners or relevant stakeholders can also present changes... Everybody is up to date."*

4.2.4 Analysis of essential traditional project management practices

Interviewees shared a common thought that traditional project management practices still hold some essential value involving delivering projects in contexts in the company. They believe that the necessity for structured planning and clarity of scope is important,

which agile methods sometimes lack. Interviewee A mentioned that the initial comprehensive planning remains crucial, but agile is the correct way. Interviewee D noted that for delivery projects with clear beginnings and ends, traditional methods such as the waterfall model work well. Interviewee B emphasized that agile frameworks should be adapted based on context, which in a way supports the need for retaining certain traditional practices. Interviewee C noted the value of the gate model and work breakdown structures, and suggested that if agile can be integrated with the gate model, then issues can be solved. Interviewee E highlighted that traditional experience-based knowledge is irreplaceable, and contextual adaptability is important in project management. According to Interviewee E, methodologies should be adapted to fit the people and the project. These indicate a conceptual overlap in the case organization rather than a strict divide between methodologies. A key similarity found across interviews is the belief that project type and context must dictate the methodology in their organization.

Table 14. Interviewee quotes on essential traditional project management practices.

Interviewee	Interviewee quotes
Interviewee A	*"Previously in the traditional way of working you would need to kind of plan everything very well at the beginning… definitely our right model is agile when we are doing development work."*
Interviewee B	*"It offers you a framework, but it is not everything… maybe this is my opinion as well that you need to think about that."*
Interviewee C	*"I really like the gate model myself… the bad thing about the gate model is that it cannot solve all the issues at team level, but when you adopt agile practices to the teams then you can manage that… I think SAFe is just a more complex way to present a traditional work breakdown structure."*
Interviewee D	*"When delivering these kinds of projects with a clear beginning and end and clear acceptance criteria… you can benefit more from the waterfall or hybrid way of working… sometimes*

Interviewee	Interviewee quotes
	waterfall…more hierarchy top down kind of approach…might be working a little bit better."
Interviewee E	*"Sometimes a fancy methodology may look good in an office but when it comes to the actual execution…It may be a disaster…Experience, there is no substitute for experience from the people…so that is something which I personally believe cannot be replaced by any methodology whatsoever…"*

4.2.5 Analysis of key enablers of agility within hybrid management approach

Interviewees emphasised on a range of enablers that are crucial to fostering agility in their organization. The importance of a clear role definition is a significant point mentioned by the interviewees. Both interviewees A and B emphasized the need for team members to understand their roles within the broader framework with the help of agile coaches and mentors. Interviewee D mentioned that communication and collaboration with mutual agreement on deliverables are important. Interviewee C mentioned that dedicated and stable teams are important in the organization, particularly in Scrum settings. Interviewee E mentioned a broader market-driven view of the case organization. According to Interviewee E, continuous market evaluation and rapid adaptation to change are key enablers of agility in the case organization. From the analysis, this indicates internal organizational enablers such as defined roles, agile coaching, standard processes, dedicated teams, agreements, communication, and collaboration. It also indicates external enablers, such as market evaluation, as a catalyst for agility within a hybrid project management setting in the case organization.

Table 15. Interviewee quotes on key enablers of agility.

Interviewee	Interviewee quotes
Interviewee A	*"We luckily we have agile coaches here, so they helping us to give us the kind of mentoring and coaching... that's very important as*

Interviewee	Interviewee quotes
	well that you have the persons or the person with you with this journey that helps you."
Interviewee B	*"One is to getting people understand the role of their own role in this whole big picture... Cause people do things. Framework or some tools doesn't, people do things… We should have some kind of standardized tools."*
Interviewee C	*"You have to have the dedicated team. That's the key. Otherwise it really doesn't work…At least the Scrum methodology... is based on a stable team and that's the core of everything."*
Interviewee D	*"Key enablers, well communication and collaboration, trust."* *"It all comes down to us collaborating and communicating."* *"Agreeing the way of workings and agreeing the deliverables and agreeing on the definition of done."*
Interviewee E	*"Evaluate your market position every day, every week, every month... That continuous evaluation... is a key enabler for the agile mindset."*

4.2.6 Analysis on organizational agility enhancement

A key theme that emerges from Interviewees A and B, is the use of product roadmaps as a strategic guide for managing changes in their project management process. Both of them emphasized that product roadmaps are essential and they must be living documents constantly updated in response to the evolving market on a rapid pace of change. Interviewees A and B mentioned that product roadmaps may lag behind actual market dynamics, so it has to be always updated. Interviewee C mentioned that organizations can establish checkpoints for correction by avoiding oversized projects and setting thresholds for the project to be a program. Interviewee D mentioned that feedback loops and early testing with validation help them to make corrections early. According to Interviewee D, continuous validation and a readiness to change are vital for staying aligned with the shifting customer needs of the company. Interviewee E highlighted a people-

centric approach and mentioned that continuous dialogue and cross-functional collaboration are important for agility enhancement in the organization. All the interviewees acknowledged the importance of mechanisms for agility enhancement, such as a product roadmap, a feedback loop, customer involvement, checkpoints, early testing with validation, and collaborations in their organization.

Table 16. Interviewee quotes on organizational agility enhancement.

Interviewee	Interviewee quotes
Interviewee A	*"We are doing the product roadmap...if some changes are coming from the markets. So how we are going to react to that, so that should be kind of one."*
Interviewee B	*"We need to be aware that even we will have like create this product road map it is not like a fixed document. We need to update and see what are the changes around the product area."* *"The world is changing more quickly than the roadmap normally."*
Interviewee C	*"You might need to change the sub-project inside the programme to better suit the customer needs, or the changed requirements."* *"If it goes above a certain threshold, then it should be actually a programme…instead of one massive project."*
Interviewee D	*"You need that customer involvement...and then change accordingly."* *"In the testing phase, that something is not working…You need to get the feedback loop ongoing and ideally be able to test your ideas and also be ready to kill them early enough."*
Interviewee E	*"Through continuous dialogue and collaboration…our product managers are travelling around the world talking to customers… following the market trends, mega trends, geopolitics."*

4.3 Findings

Findings for this study are presented and described in relation to the research framework. The research framework of this study integrates agile methods with traditional project management, identifies and resolves constraints, and agility enablers guide a process of transforming current traditional practices, enhancing organizational agility, and developing a hybrid project management approach.

The findings of this thesis have been obtained through thematic analysis of the research questions interview data, and these findings are guided by the research objectives.

Research Objectives:

1. To identify the challenges of integrating agile management with traditional project management.
2. To assess strategies for integrating agile management in traditional project management processes to achieve organizational agility while addressing specific constraints.

Research Questions:

1. How agile project management practices can be implemented to enhance organizational agility.

1.1 What challenges might arise when integrating agile methodologies into existing project management processes?

1.2 What best practices and strategies can be employed to ensure successful integration of Agile practices?

4.3.1 Challenges of integrating agile methodologies

The identified key themes that emerged from the thematic analysis of this study are organized and described according to the research framework, research objectives, and research questions to ensure clarity of the research findings.

Figure 9. Challenges of integrating agile methodologies.

Legacy of the waterfall model

This theme relates to the early phase of the research framework of this study, where agile is introduced to the existing traditional project management and constraint identification. In relation to the research framework, when agile methods and practices are introduced, the legacy of waterfall has been identified as a constraint. One of the challenges has been the influence of traditional project management approaches, particularly the waterfall model, in the organization. while agile is being introduced, it has been found that the mindset and routines rooted in linear project planning still influence many aspects of the organization's workflow. The existing culture is shaped by years of hierarchical, plan-driven management, making the agile transition a complex and gradual process. The organization is in early transition phases, and while agile is discussed in theory, its practical implementation is inconsistent. In relation to the research framework, when agile methods and practices are introduced, the legacy of waterfall has been identified as a constraint.

Table 17. Interviewee quotes on the legacy of the waterfall model.

Interviewee	Interviewee quotes
Interviewee A	*“We are, I would say, the beginning of the journey... the theory is done. But now we need to start to implement that.”* *“Although we had the kind of waterfall way of working before. But it wasn't really a good waterfall project management.”* *"Some have a very good understanding of agile and some not... it goes very easily to the old model."*
Interviewee E	*“Historically, it's a project-driven organisation... we have delivered so many different products around the years... we can't forget them.”*

Cultural resistance, mindset shifts, and misunderstanding

There is resistance from individuals uncomfortable with the shift toward team autonomy and self-organization. This theme aligns with the agile integration and constraint identification phase of the research framework. In relation to the research framework, when agile practices such as daily standups, increments, and sprints are introduced, team members' mindset, expectations of clear instructions, and not understanding the ceremonies are recognised, which represent the constraint identification of the research framework. With shifting team mindsets from command-centric to autonomy and ownership, many employees expect clear instructions, which conflicts with agile’s emphasis on employees' self-organization and ownership. Ceremonies like daily stand-ups are misinterpreted as micromanagement, and this misunderstanding contributes to the discomfort and resistance of the team members.

Table 18. Interviewee quotes on cultural resistance, mindset shifts, and misunderstanding.

Interviewee	Interviewee quotes
Interviewee A	*“We are kind of really, really struggling with that at the moment and with the mindset definitely.”* *"We have this more kind of the stand-ups and to kind of tell what you have done and what you're going to do next. So people are kind of feeling that this is micromanaging."*
Interviewee B	*"Now you have to do it by yourself, and that is a big issue... most people are waiting for someone to say now you need to do this and that."*

Role confusion and overlapping

From the findings, the transition to agile created confusion of roles and responsibilities in the case organization. This theme resembles the research framework of this study, which focuses on the agile integration, constraints identification, and hybrid project management phase. For some of the team members, overlapping roles between traditional project management and new agile roles created stress. Agile transformations in the case organization occurred without redefining some of the team members' existing responsibilities. This role confusion created a misunderstanding of dual-role expectations for some team members. From the findings, the lines between the product owner and project manager are blurred, and there is a lack of formal role clarity in cross-functional teams of the case company. The challenge of handling both agile and traditional responsibilities simultaneously in the organization caused exhaustion and unclear expectations for the teams.

Table 19. Interviewee quotes on role confusion and overlapping.

Interviewee	Interviewee quotes
Interviewee C	*“We mostly have internally this kind of product owner kind of roles so that was when I first started to test these agile practises...I didn't really understand what I am trying to manage."*
Interviewee D	*“Roles and responsibilities that are not clear... we still have our roles from the old world... and on top of that we’re kind of putting the agile responsibilities.”* *"You’re just kind of adding tasks on top of your lists and not really changing the way it works…Resistance comes more... from the feeling that you need to commit to more tasks than before."*

Resource constraints and dependencies

There is a limited availability of expert agile personnel in the case organization. Experts are often involved across multiple agile initiatives. This theme directly aligns with the constraint identification phase of the research framework. Agile implementation is hampered by the limited availability of experts in the organization, especially when trying to scale agile practices across large, complex projects. According to the findings, external and internal dependencies can make deliveries slower. Team members wait for inputs from other departments in the organization. There is also a need for a more extensive, unified training plan and an internal dedicated agile team. Constraints such as limitation of a dedicated team, not having an extensive unified training plan, external and internal dependencies, and a limited number of agile experts have been found in the organization.

Table 20. Interviewee quotes on resource constraints and dependencies.

Interviewee	Interviewee quotes
Interviewee A	*"Getting the agile Training at the moment because it has been really that in different groups, and we don't have a clear kind of plan how to go forward with people"*
Interviewee C	*"Not having a dedicated team, maybe that's the biggest. That was the biggest obstacle for first."* *"Because of external dependencies. So a lot of times we are waiting for inputs from some other department that They need to first complete something and then we are able to do it."*
Interviewee D	*"Our technology organisation is now very lean... only one expert for a certain area and he or she needs to be involved in basically everything."*

Misalignment between internal and external workflows

Implementing agile practices in the organization has a lack of synchronization between internal agile aspirations and the workflows of external stakeholders or partners. This theme relates to the agile methods integration and constraint identification phase of the research framework. Third-party collaborators found to be unfamiliar with newly exercised agile practices and communication styles of the organization, and fixed deadlines constrain flexibility and iterative adjustments. This introduces resistance into the development cycle, as external or partner workflows are often long-term and rigid, contrasting with the organization's internal agile way.

Table 21. Interviewee quotes on misalignment between internal and external workflows.

Interviewee	Interviewee quotes
Interviewee B	*"When we working with some of the projects we will have also some third parties... they can be really totally different way of working."*
Interviewee C	*“One big, big challenge in our organisation is that we are using a lot of externals like designers and engineers.”* *"In agile you would try to do this projection... but of course in this bigger projects usually somebody has already decided the deadline."*

Limited end-customer involvement

It has been found that in the organization, there is a need for more customer engagement. This is an identified constraint that aligns with the constraint identification phase of the research framework of this study. Direct engagement with end customers is found to be insufficient in the organization. There is a gap in dialogue between technical teams and customers, and sales teams sometimes stand in for end users. The absence of meaningful customer feedback loops reduces the relevance and responsiveness of agile outputs for the case organization.

Table 22. Interviewee quotes on limited end-customer involvement.

Interviewee	Interviewee quotes
Interviewee A	*"The end customer who is buying our power…that is the customer... so it’s not clear at all."*
Interviewee B	*"Dialogue between the end customer and the product development…it is not like as it should be."*

Interviewee	Interviewee quotes
Interviewee D	*"You need to understand who your customer is... I would maybe consider here that it's the sales…They bring us the actual requirements... then we will try to understand: is this one customer-specific… or a market need?"*

4.3.2 Practices and strategies for successful integration of agile methods

The identified key themes from the data analysis, on the practices and strategies for the successful integration of agile methodologies, emerged from the thematic analysis of the research questions. Themes are organized and described according to the research framework, research objectives, and research questions to ensure clarity of the research findings.

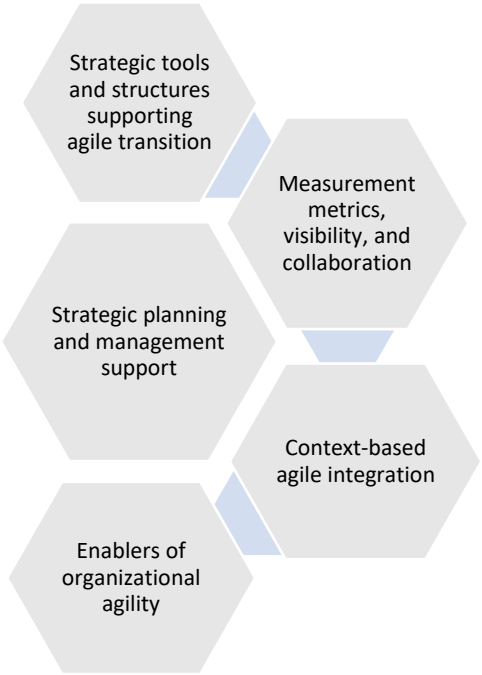

Figure 10. Practices and strategies for the successful integration of agile methods.

Strategic planning and management support

According to the findings, leadership is evolving from traditional to agile roles in the organization. Higher management is also supporting agile integration. This theme relates to this study's agile integration phase of the research framework. Gradual implementation of agile ceremonies, educating people, creating awareness, organizational training, and programs has been arranged to create an understanding of agile methods in the company. Interviewees described workshops, manuals, demo sessions, and pilots are instrumental in spreading the understanding and acceptance of agile principles. Dedicated agile roles, such as scrum master and coaches, have an active role in enhancing the implementation of agile practices in the organization.

Table 23. Interviewee quotes on strategic planning and management support.

Interviewee	Interviewee quotes
Interviewee A	*"Our management has been really kind of promoting the agile way of working...lead to change their Kind of leadership…that we are getting the agile implemented…they have a crucial role."*
Interviewee B	*"This is a marathon. This is not the Sprint at all."*
Interviewee E	*"The first and foremost step…was to educate people to create awareness."* *"One of the matters they have been focusing on is the engagement of the organisation…When we do the demo session… it was extended… and then it was taken to the whole organisation."*

Strategic tools and structures supporting agile transition

This theme resembles with the agile integration, agility enhancement, and constraint resolution of the research framework. Constraint resolution mechanisms such as feedback loop, early testing and validation, and cross-functional collaboration are found to be in practice within the organization. The agile experts of the organization have advised to use strategic tools such as the continuously updated product roadmap to adapt to

diverse market conditions. Implementation of agile ceremonies, planning days, training plan, team engagements, sessions, manuals, pilot projects, and support systems enhances the agile integration process of the case organization. Interviewees mentioned establishing thresholds that trigger the transition from projects to programs, and organizations can establish checkpoints for correction and changes. Interviewees also mentioned continuous cross-functional collaboration, feedback-driven change, and early testing and validation. All of these findings from the study relate to the agile integration, constraint resolution, and organizational agility enhancement of the research framework.

Table 24. Interviewee quotes on strategic tools and structures supporting agile transition.

Interviewee	Interviewee quotes
Interviewee A	*"We are doing the product roadmap... if some changes are coming from the markets so how we are going to react to that."* *"We have the theory...we share what are the ceremonies. We have the product owners in place and an actual office kind of supporting the actual where you're working."*
Interviewee B	*"We need a lot of discussion and dialogue in the team"*
Interviewee C	*"If it goes above a certain threshold, then it should be actually a programme… instead of one massive project."*
Interviewee D	*"In the testing phase, that something is not working…You need to get the feedback loop ongoing and ideally be able to test your ideas and also be ready to kill them early enough."*
Interviewee E	*"When you have the stand-up meetings... you get the transparency that hey, if somebody is having some issues...product owners or relevant stakeholders can also present changes... Everybody is up to date."*

Measurement metrics, visibility, and collaboration

Effective measurement metrics have been found as essential for agile project management success in the organization. This theme aligns with the integration of agile methods and hybrid practice in relation to the research framework, where the organization measures and monitors its agile practice to ensure the integration. Velocity tracking, increment planning, sprint monitoring, and cost tracking are used to measure iterative progress in the case organization. Additionally, collaboration and visibility of work make it easy to measure the progress of work and foster communication in the organization. A shared insight of the interviewees is that measurement mechanisms of agile practices in the case organization are not just operational tools but can project the real progress and ensure successful agile integration.

Table 25. Interviewee quotes on measurement metrics, visibility, and collaboration.

Interviewee	Interviewee quotes
Interviewee C	*"I really like this velocity measurement... because in traditional projects...a task was 75% complete but what does it actually tell you?... In the agile way of thinking... the task is either completed or not completed."*
Interviewee D	*"It's crucial in the agile way of working, this kind of frequent collaboration and communication."* *"I try to make my work visible… so that others also know what's going on."*
Interviewee E	*"When we do the demo session… it was extended… and then it was taken to the whole organisation."*

Context-based agile integration

One expressed theme from the interviewees is the essential for contextual applicability in integrating agile practices. This theme reflects on the hybrid project management approach of the research framework, where agile practices are embedded in the traditional

project management and organization practices hybrid project management approach. Interviewees recognized that the project context should guide the type of project management methodology. According to the interviewees, traditional practices like gate reviews, upfront planning, and work breakdown structure remain valuable in certain contexts where traditional practices are applicable. Interviewees mentioned the irreplaceable nature of experience-based knowledge, which is important in actual execution. It has been found from the data analysis that interviewees also supported a flexible approach to methodological choice rather than a straight shift, combining agile and traditional practices into a context-specific hybrid approach.

Table 26. Interviewee quotes on context-based agile integration.

Interviewee	Interviewee quotes
Interviewee A	*"Previously in the traditional way of working you would need to kind of plan everything very well at the beginning… definitely our right model is agile when we are doing development work."*
Interviewee B	*"It offers you a framework, but it is not everything… maybe this is my opinion as well that you need to think about that."*
Interviewee D	*"When delivering these kinds of projects with a clear beginning and end and clear acceptance criteria… you can benefit more from the waterfall or hybrid way of working… sometimes waterfall…more hierarchy, top-down kind of approach…might be working a little bit better."*
Interviewee E	*"Sometimes a fancy methodology may look good in an office but when it comes to the actual execution…It may be a disaster…Experience, there is no substitute for experience from the people…so that is something which I personally believe cannot be replaced by any methodology whatsoever…"*

Enablers of organizational agility

This theme reflects on the enablers of agility in relation to the research framework of this study, that allow enhanced organizational agility and support the agile integration process in traditional environments. The interviewees have repeatedly mentioned product roadmaps, collaboration, and feedback loops as tools for enabling organizational responsiveness. According to the interviewees, continuous validation through early testing helped the organization align projects with changing customer needs, which is reflecting the constraint resolution and organizational agility enhancement of the research framework. Strong cross-functional communication, continuous market evaluation has been found crucial for the case organization to foster adaptability and certainty in terms of changing market conditions. Also, clear role definitions, dedicated teams, flexibility, and customer involvement have been found as enablers and requirements to foster the integration of agile practices and to support enhancement of organizational agility in the company.

Table 27. Interviewee quotes on enablers of organizational agility.

Interviewee	Interviewee quotes
Interviewee B	*"I think one is to getting people understand the role of their own role in this whole big picture."* *"like create this product roadmap…we need to update and see that what are the changes around the product area."*
Interviewee D	*"During frequently feedback…You need that customer involvement...you need to be aware of if this project or product makes sense that what you're working with and then change accordingly."*
Interviewee E	*"One of the biggest features or the biggest advantage of agile methodology is the flexibility…every customer is different. Every project is different"*

Interviewee	Interviewee quotes
	"Through continuous dialogue and collaboration… our product managers are travelling around the world talking to customers… following the market trends, mega trends, geopolitics."

4.3.3 Summary of the Findings

The findings of this study reveal several key challenges and strategies that align with the research framework related to the integration of agile management practices into traditional project management to enhance organizational agility. The organization is in the early stage of agile transition. One significant challenge identified from the data analysis is the strong legacy of the waterfall model. Hierarchical and linear project management approaches continue to influence the organizational workflows in the company. As a result, while agile practices are being introduced, their implementation remains inconsistent and gradual. Many employees struggle to adjust their mindset from a traditional mindset to agile, so cultural resistance also complicates the transition. Agile ceremonies, such as daily stand-ups, are sometimes misunderstood as micromanagement, which causes resistance among team members.

Role confusion also emerged as a notable challenge from the study. For some of the team members, the overlapping of responsibilities between traditional roles and newly implemented agile practices has led to stress and dual-role exhaustion. Resource constraints in the case organization have been found in this study. The availability of expert agile practitioners is limited in the company, which hinders the exercise of agile practices across larger and complex projects. Also, there has been a need for an internal dedicated agile team. A need for an extensively cohesive training plan is also evident in the case organization. Additionally, misalignment between internal agile workflows and the traditional practices of external stakeholders of the organization creates a lack of synchronization. Also, the direct involvement of end customers in the process is very limited or almost non-existent.

The case organization introduced agile methods through leadership initiatives, training programs, workshops, and the establishment of dedicated agile roles such as Scrum Masters and Agile Coaches. To address the challenges with agile integration and resolve the constraints, the case organization implemented several strategies. The case organization has been found to use strategic tools and practices such as product roadmaps, agile ceremonies, planning days, and feedback loops. These have supported the agile integration, constraint resolution, and organizational agility enhancement for the case organization.

Measurement metrics such as velocity tracking, cost monitoring, sprints, and increment planning with collaboration and visibility of work are being practiced by the teams to ensure successful agile integration in the case organization. Strategic planning, a unified training plan, team engagements, mindset transformation, sessions, manuals, pilot projects, and management support have been found critical in facilitating the gradual adoption of agile practices and constraint resolutions for the organization.

Another theme from the findings is the importance of context-based agile integration. Rather than applying agile across all projects, managers of the organization tend to combine agile and traditional practices based on the context. In the case organization traditional methods such as gate reviews, upfront planning, and experience-based project management practices, are still valued where applicable.

From the findings of this study, several enablers of organizational agility have been identified in the company. The enablers include product roadmaps, strong cross-functional collaboration, feedback loops, communication, continuous validation through early testing, clear role definitions, a dedicated team, customer involvement, and continuous market evaluation. These elements have been found essential for the case company in supporting the integration of agile practices and the enhancement of organizational agility through a hybrid project management setting.

Here is the representation of the findings from the analysis in relation to the conceptual research framework of this study.

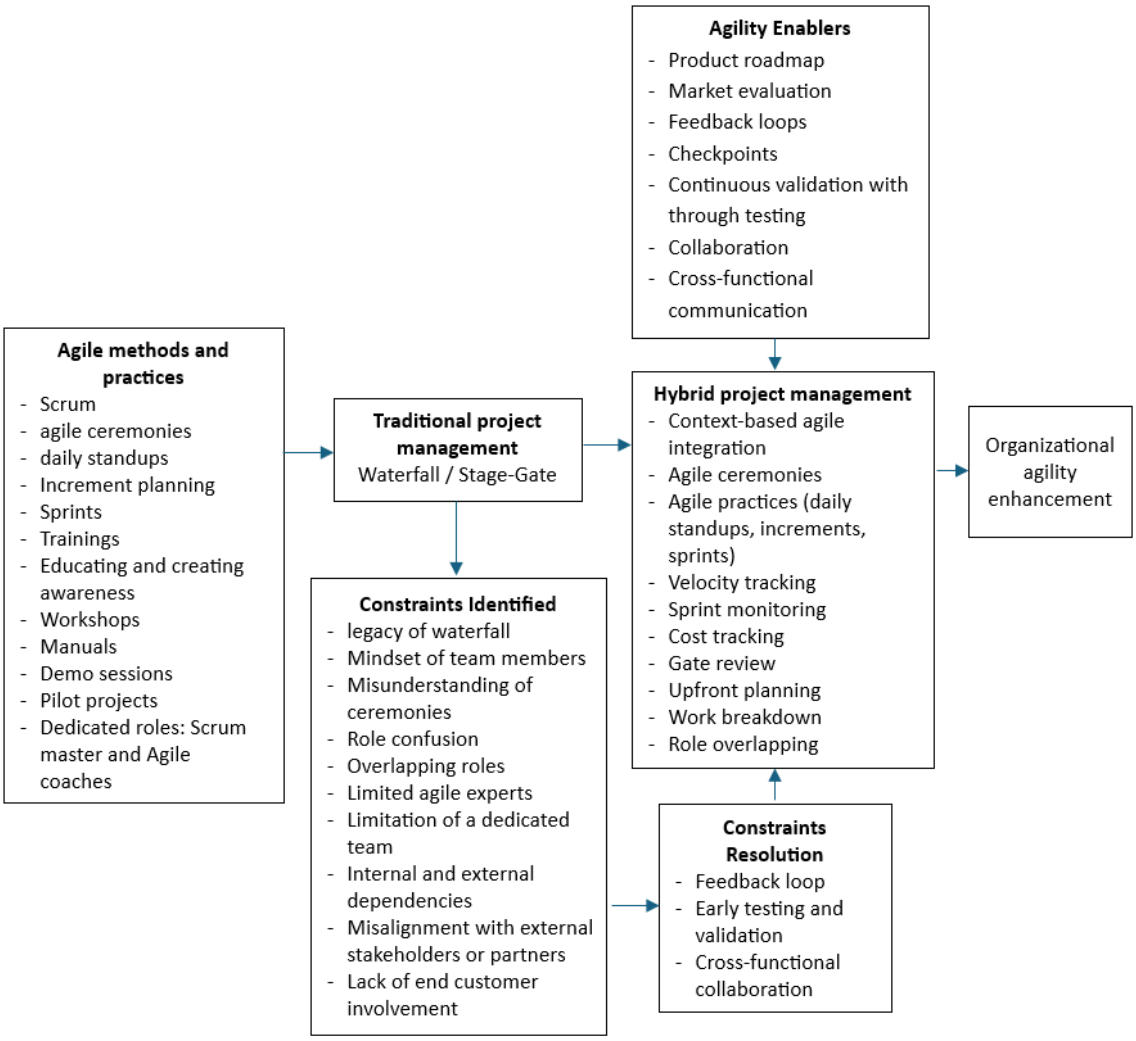

Figure 11. Reflection of the findings in relation to the research framework.

In relation to the research framework of this study, the organization has introduced agile methods and practices such as the gradual implementation of agile ceremonies, educating people, creating awareness, training, workshops, demo sessions, and pilot projects, which also emphasize the hybridization of methods. The case organisation is practicing increments, planning days, sprint monitoring, velocity tracking, and cost tracking, which monitor the iterative progress and ensure the integration of agile practices. For constraint identification and resolution, mechanisms such as feedback loop, early testing and validation, and cross-functional collaboration are found in the current practice. For

organizational agility enhancement, enablers such as product roadmaps, feedback loops, continuous validation through early testing, market evaluation, and collaborative work have been found in the organization. The hybridization of methods reflects the similarity with the research framework of this study. It has been found that the practice of upfront planning, gate reviews, and work breakdown is still valued in the case organization, particularly in contexts where experience-based execution remains relevant.

5 Discussion

The findings evidently indicate that the integration of agile practices into the traditionally structured project management environments in the case organization is a complicated process that is influenced by numerous aspects of the case organization's culture, structure, and operations.

The critical obstacles to agile management integration in the case organization are the existing influence of the waterfall model, its deeply rooted years of practiced traditional project management culture, and the mindsets of the team members. The legacy of the waterfall model emerged as a significant challenge in the case organization, with many project management processes and mindsets still oriented toward a sequential, command-driven management style. According to Ciric et al. (2019) organisational culture most likely resists agile project management to some extent. It takes time and necessitates a cultural shift, since agile project management differs from the traditional structure of management (Ciric et al., 2019).

Team members have been found to misinterpret agile practices, such as the daily stand-ups, as micromanagement. The misinterpretation of agile ceremonies as micromanagement, such as daily stand-ups being perceived as micromanagement or surveillance, highlights that the cultural shift in the case organization depends on the mindset of the team members, and team member of the case organization needs a mindset shift. From the analysis of the findings, in the early phase of agile integration, team members have been found to be in an unclear state about their roles and responsibilities in the organization. As team members still have the roles from the existing traditional practices in the organization, on top of that, putting the agile responsibilities also creates an overlap. These findings in the case company resonate with the literature. Abdulaziz et al. (2021) mentioned that an important drawback of the traditional waterfall development mindset is the unfamiliarity with agile management systems. According to Mergel et al. (2021) in bureaucratic control and command organisations, agile is a mindset that starts a

cultural shift. Agile administrations are responsive to changes and can adapt to the ever-changing environment (Mergel et al., 2021).

Challenges such as a lack of resources and dependency have also been found in this study, while agile methods are integrated in the case organizations' traditional settings. The need for more agile experts and dedicated teams has been frequently mentioned by the interviewees. There are numerous projects that are practicing agile practices across the case organization. So, there is a deficiency of agile experts in the organization. Further, dependencies such as reliance on third parties and cross-functional departments that are not aligned with the agile workflow of the case company create synchronization issues. According to the interviewees, the imposed fixed deadlines and traditional external parties limit agile responsiveness. From the findings, the identified resource constraints and dependencies of the organization also reflect in the literature. Nejatian & Zarei (2013) mentioned that effective resource allocation may prove difficult for organisations, which could hinder their agility efforts. According to Stray et al. (2019) when it involves large-scale project dependency management, project progress may be impacted when it is unclear who does what or how they are doing it.

In the organization, a constant challenge is the limited involvement of the end customers. customer insights are often filtered through sales personnel in the organization, and it has also been found that the direct attachment to the end user is very much limited. This detachment from the end users is found to weaken the feedback loops in the organization. According to PMI (2015) organizational agility is the capability of swiftly adjusting to shifting market situations, such as the demands of customers. Frequent interactions between team members and customers are crucial to understanding requirements and providing a prompt reaction to any modifications the customer requests in order to maintain the basic agile values (Bin-Hezam & Alyahya, 2016).

The findings reveal that even though the case organization has an agile aspiration and implements training sessions, but an extensive training plan is required. Daraojimba et

al. (2024) found that training is a very important managerial factor that influences the adoption of agile, and when an organization accepts agile, training is very crucial for the executives.

Management support, leadership, and strategic planning have emerged as the key findings of the agile integration strategy in the case organization. To ensure the agile integration, the case organization has taken several steps, such as management has been found to be promoting the agile way of working. Leadership roles are evolving so that the case organization is getting to the agile implementation. Gradual implementation of agile ceremonies, educating people, creating awareness, workshops, demo sessions, and pilot projects indicates the strategic planning from the management and leadership to foster an agile integration strategy in the company. According to Daraojimba et al. (2024), agile approaches are widely used and successful in many circumstances, and management support is essential so that organisations don't face obstacles when implementing agile approaches. Leadership that promotes collaboration among team members is a key aspect of agile project management (Binci et al., 2023). Vaszkun & Sziráki (2023) described organizational agility and mentioned agile leadership, by which agile organizations are typically characterized. According to Mrugalska & Ahmed (2021) strategy is an agility dimension in modern Industries. For adopting agile methods, project management strategy, formal guidelines, and standard processes are essential (Abdulaziz et al., 2021).

The findings from the thematic data analysis have revealed that embedding agile practices within this traditionally structured case organization requires a combination of strategic tools, supportive structures, and agile-enabling mechanisms. This study's findings highlighted the use of product roadmaps in the case company as a core strategic tool. Interviewees mentioned that product roadmaps should be constantly updated to reflect market changes to serve as a market-aligned adaptation mechanism for the organization. It has been observed that the organization dose implementation of agile ceremonies, planning days, manuals, team engagement sessions, pilot projects, and training sessions

supports iterative learning and adaptation of agile methods. This structural approach in the case organization has been complemented by a feedback loop, early testing and validation, and continuous cross-functional collaboration. All together, these practices strengthen agile integration, constraint resolution, and organizational agility enhancement in the case company. These discussed findings appear to be in the literature and are very essential to the outcomes observed in this study. According to Anca-Ioana (2019), organizational agility is the ability of an organization to respond swiftly to changes in its environment. Several managerial techniques and tools can be strategically integrated to achieve agility, which need to be successfully combined (Zhang & Sharifi, 2000). The short feedback and development cycles is regarded as a significant feature as the ability to promptly detect mistakes (Thesing et al., 2021). Team members collaborate extensively when they use agile components with regular discussions (Conforto & Amaral, 2016).

The findings of this study emphasize the critical role of effective measurement metrics in ensuring the integration of agile methods and practices in the case organization within the traditional structure. Findings revealed that practices such as velocity tracking, increment planning, sprint monitoring, and cost tracking are essential to monitoring iterative progress in the organization. Findings from the data analysis revealed that these serve as a strategic mechanism to capture actual project progression and validate agile integration within a hybrid project environment. These findings are supported by the literature, such as according to Brandl et al., (2018) hybrid integration strategy should be incorporated into a framework that has a performance measurement method and incorporates a productive failure management system. Leveraging data mining and algorithms to automate the combination of practices can help organizations customize hybrid models (Bianchi et al., 2022). According to Hidalgo (2019) the scrum framework in agile project management helps team members by breaking tasks into small task and short cycle durations called sprints.

From the findings, a number of key enablers of organizational agility have been found in the organization. Product roadmaps, continuous feedback loops, and collaborative work environments are identified as facilitating the responsiveness to changes in the organization. According to the interviewees, continuous validation through early testing and constant market evaluation has been found to be some of the mechanisms that enhance the organization's capacity to adapt. According to Hagen et al. (2024), for international ventures, enablers of organizational agility can be continuous learning, a balanced approach to flexibility and stability, effective management of paradoxes, and selective responsiveness. Fallmyr & Bygstad (2014) mentioned that enterprise architecture and information & communication technology can be enablers of organizational agility by offering the systems and technology to integrate business processes across organizations. According to Zitkiene & Deksnys (2018) enablers that can help organizations attain agility is a viewpoint to observing agility and agile organizations exercise the key practices regularly.

Furthermore, the findings from the data analysis in this study highlighted a context-based applicability when integrating agile practices into existing traditional project management structures. Rather than a complete shift, managers in the case organization tend to express the importance of adopting a hybrid approach tailored to project-specific factors such as project context. Also, in the current project management practice of the organization, it has been found that team members still have many previously practiced roles along with the introduced agile practices. Traditional elements such as gate reviews, upfront planning, and work breakdown structures were recognized in the findings as necessary in certain contexts, particularly where experience-based execution remains relevant. Bianchi et al. (2022) discuss the impracticality of full agile adoption outside software development and endorse hybridization by combining practices for diverse contexts. Koceska & Koceski (2022) mentioned that for complex projects that require both agility in the developing phase and planning in the front, entirely agile or traditional approaches are insufficient. An agile and waterfall combination of hybrid project

management methodology is useful and effective when there is a need for both agility and structure (Koceska & Koceski, 2022).

5.1 Theory of Constraints (TOC) application

In this study, the conceptual framework consists of the theory of constraints as a mechanism for constraint identification and resolution. From the findings of the data analysis, it is found that the organization practices mechanisms, such as feedback loop, early testing and validation, and cross-functional collaborations, where they try to identify and resolve the constraints, which also reflects the similarity of usage to the theory of constraints. Additionally, velocity tracking, sprint monitoring, product roadmap, and market evolution also support the constraints identification and resolution process in the organization.

According to Ifandoudas & Chapman (2009) through the five steps of the theory of constraints, the strategic characteristic of agility is achievable. The theory of constraints (TOC) perspective is a useful strategy for developing into an agile manufacturer (Ifandoudas & Chapman, 2009). While describing the theory of constraints, Izmailov (2014) mentioned that you get more important, decision-enabling information straight from the plant floor with less data when you use a constraint-based strategy to optimise the product flow through the plant. Izmailov, (2014) further describes that to achieve this, data collection is prioritised and limited, and the main chronic constraints which need to be fixed in order to reach a given velocity goal are identified. This enables plant staff to concentrate their efforts on problem-solving that will result in greater increases in plant efficiency (Izmailov, 2014).

6 Conclusion

This study was intended to explore how agile management practices can be embedded within traditional project management frameworks to enhance organizational agility. This study has been guided by a particular focus based on the research objectives of identifying agile integration challenges and assessing strategies that can address the constraints while enhancing organizational agility.

This study reflects on the research framework, which aligns its findings with the interconnected stages involving the introduction of agile methods into traditional project management settings, the identification of organizational constraints, and their resolutions, the implementation of organizational agility enablers, and the development of a hybrid project management approach.

The study answers the research questions through thematic analysis of semi-structured interviews by uncovering the key challenges and effective strategies involved in integrating agile practices into traditional project management to enhance organizational agility. The study uses a qualitative methodology, which is supported by semi-structured interviews and thematic analysis that uncovered insights into the case organizations' transitional dynamics of the agile integration journey.

6.1 Limitations of the study

Here are the remarks on the limitations of this study that should be acknowledged. Even though all the interviewees were the key members and very much involved in the agile integration process for the case organization, the findings may not be broadly generalizable across all organizations or industries. With the qualitative research based on semi-structured interviews and thematic analysis, the cross-sectional time horizon can provide a current reflection of the ongoing transition from traditional to agile management practices, but this can be a limitation in understanding and observing long-term outcomes, meaning, and the evolving dynamics. This study is related to how agile practices

can be integrated with the traditional framework, which needs to capture the full complexity of organizational culture, structure, and operations, and this poses a significant challenge. Cultural and contextual factors are often deeply rooted, which are naturally very complex to fully uncover and articulate. As a result, some critical insights may have been overlooked or underexplored. Despite these limitations, careful attention was given to selecting interview participants, crafting relevant semi-structured interview questions, and conducting a thorough thematic analysis to extract meaningful findings.

6.2 Suggestions for Future Research

According to the findings, limitations, and context of this study, here are the suggestions for any future research. Future studies can adopt a longitudinal research design in terms of time horizon to observe the agile integration process over time, the changes in the operation, capturing evolving challenges, learnings of the organization, and the long-term impacts on agility enhancement. Future research can expand the sample size and include diverse roles. Research can be done on the industry-specific agile integration, such as healthcare, education, and agriculture etc. These will enhance the generalizability of the findings. Further research can be done on how the organization can formally implement a constraint-focused method, such as the theory of constraints. Future studies can test any implementation of frameworks or tools that are tailored for organizations transitioning to an agile approach within traditional project management environments. Various kinds of comparative studies can be done between fully agile, traditional, and hybrid management across different functional and operational contexts within the organization, which may also provide deeper insights.

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