



**CHALMERS**  
UNIVERSITY OF TECHNOLOGY



# **When Project Management Methods Collide**

Conditions for agile and challenges in a large ICT firm using agile and traditional methods

Master's Thesis in the Master's Program Quality and Operations Management

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## Abstract

The need for organizations to perform projects well has increased in today's international, demanding, and ever-changing market. To manage projects, organizations can utilize different project management methods, where recently there has been a transition from traditional to agile project management methods (APM). It has however come to light that the use of APM has not always been successful and that there are situations where traditional methods would have been more favorable.

Therefore, for organizations to remain competitive, a need to apply the most favorable method depending on the specific situation has arisen which has resulted in the coexistence of both agile and traditional methods within larger organizations, conducting projects in parallel. However, due to the different and oftentimes contrasting principles of different methods, i.e., – agile & traditional – challenges are likely to arise within such environments. The purpose of this thesis is thus to understand when APM is more favorable compared to traditional methods. In addition, the thesis aims to identify potential challenges that could arise when agile and traditional methods are employed by different teams within an organization.

A case study at Ericsson was conducted to discover challenges that can arise due to the coexistence of agile and traditional methods. In parallel, a literature study was performed to identify factors that indicate when agile was more favorable to apply. In the study, 21 factors divided into four categories – *project*, *team*, *organizational* & *external* – were identified to influence the favorableness of APM. Furthermore, the case study identified five challenges that could arise within an organization when different methods coexist. Conjointly, these challenges pose issues within the whole organization.

In its entirety, this thesis provides practitioners with an overview of factors deemed to influence when APM is favorable along with outlining potential challenges that can occur in an environment where different project management methods are used in parallel and where these reside within an organization. All in all, this thesis facilitates a more thorough understanding of when APM is favorable and what challenges organizations that wish to apply different project management methods can anticipate while providing a basis for future research.

Keywords: agile, agile favorability, agile project management, challenges when methods collide, coordination challenges, traditional project management.



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# Terminology

**APM** – Agile project management, an iterative approach to managing projects.

**Cadence** – Describes a sequence of events, equalized to the duration of a sprint in Agile or a team’s development cycle.

**GDPR** – General Data Protection Regulation, a regulation in EU law aimed to protect personal information. Is applicable for all entities operating within the EU as well as entities outside who wish to conduct business in the EU.

**NVivo** – Computer-assisted qualitative data analysis program used in the study to code gathered data.

**PROPS** – A traditional project management method developed by Ericsson later sold to SEMCON, comparable to a Stage-Gate process.

**TPM** – Traditional project management, a linear approach to managing projects.

**XLPM** – A new version of PROPS, currently applied within Ericsson, comparable to a traditional Stage-Gate process.





# 1

## Introduction

This chapter provides a background that highlights the rationale behind the research conducted in this thesis along with the thesis's purpose and research questions.

### 1.1 Background

In an international and demanding market, performing projects well is a necessity for organizations to remain competitive. Simultaneously, managing projects is becoming increasingly challenging due to today's business environment characterized by high complexity and fast changes (Bergmann & Karwowski, 2019). To manage projects, multiple organizations have transitioned from plan-driven and linear methods, collectively defined as traditional project management methods (TPM), due to their limitations in today's ever-changing environment (Bergmann & Karwowski, 2019).

As a substitute for TPM, agile project management methods (APM) has advanced as a new project management method. Since its introduction in the software industry, APM has gained popularity among practitioners worldwide due to its iterative nature and ability to adapt to changes throughout the course of a project (Fischer & Charef, 2021). Nowadays, the method is successfully adopted in various industries including automotive, health care, and telecommunications (Hohl et al., 2016; Paasivaara et al., 2018; Sindhvani et al., 2019). In fact, APM has become a necessity for many organizations due to its ability to handle the increased uncertainties in today's unpredictable business environment (Fischer & Charef, 2021).

In spite of the vast research highlighting the superiority of APM, mainly due to its ability to adapt to changes in customer requirements, it does not exist without challenges (Batra et al., 2010; Bergmann & Karwowski, 2019; Ciric et al., 2019). For instance, for APM to be favorable, a change in organizations' culture is required which often is challenging (Thesing et al., 2021). Additionally, it has been found that the method is not always favorable (Denning, 2019) and that TPM, in certain environments, is deemed to be a more favorable project management method (Riesener et al., 2018). TPM is for instance more favorable than APM in environments where requirements are clearly defined and changes are minimal (Bianchi et al., 2020).

However, the factors that influence if APM is favorable to use are currently vaguely defined, which has led researchers to call for future research to render when the

method is favored (Bianchi, Conforto, & Amaral, 2021; Bianchi, Conforto, Rebentisch, et al., 2021; Conforto & Amaral, 2016). Factors suggested for future research include, but are not limited to team, project, and organizational characteristics such as team size, competency, and project complexity (Conforto & Amaral, 2016). Other environmental characteristics having a similar potential of influencing whether the adoption of APM is favorable are external and organizational factors (Bianchi, Conforto, Rebentisch, et al., 2021). Collectively, these characteristics make up the environment in which APM exists and thus influence whether the adoption is favorable, making it of interest to study.

Furthermore, since the importance of applying an appropriate method for managing projects has been declared by several authors (Nouredine et al., 2009; Špundak, 2014) and the favorableness of methods is dependent on the project environment, there is a need to apply both APM and TPM to manage projects within one and the same, often large and complex organization. Thus, for organizations that want to utilize the most appropriate method for their projects, different project management methods will coexist.

However, due to the often different and sometimes even conflicting principles, cultures, or processes inherent in APM and TPM, challenges are likely to arise when these coexist (Theobald & Diebold, 2018). This has been highlighted by several authors who have outlined challenges of implementing APM in an organization that previously utilized TPM (e.g., Kasauli et al., 2020; Richter et al., 2016; Theobald & Diebold, 2018). Still, there are not that many articles published within the topic yet, which has led authors to call for future research to investigate what potential issues that can arise when APM and TPM are used in parallel within an organization (Batra et al., 2010; Theobald & Diebold, 2018).

Consequently, these two areas call for future research and thus serve as the basis of this thesis that aims to provide answers to when APM is favorable to use compared to TPM and what the subsequent challenges are that might arise in large organizations that apply different methods, namely APM and TPM, to manage their projects.

## 1.2 Purpose and Research Questions

In this section, the thesis's purpose and aim are outlined, followed by a presentation of the research questions in connection with the relevant context.

### 1.2.1 Purpose

The purpose of this thesis is to understand when it is favorable to use APM. In addition, the thesis aims to identify potential challenges that could arise when APM and TPM are employed by different teams within an organization. This aim is set in order to provide practitioners with guidance on when to adopt agile methods to manage projects within their organizations.

### 1.2.2 Research Questions

Since the wide adoption of agile in various industries and by different types of organizations, there have been both successful and unsuccessful stories of its use. This has led multiple researchers to call for future research on when APM should be used and when more conventional methods are preferred instead. Thus, to fulfill the purpose of this study, one must investigate when APM is favorable to use.

*Research Question 1: When is it favorable to apply agile project management methods?*

Albeit the recently revealed shift in application from traditional to more agile methods, many and especially large organizations still use different project management methods. Thus, there exist large organizations having teams deploying agile and traditional methods to manage projects conducted in parallel. It is therefore of interest to investigate what potential challenges such organizations face.

*Research Question 2: What challenges can arise within an organization when agile and traditional project management methods coexist?*

## 1.3 Delimitations

In the investigation to answer the first research question, this thesis was delimited to examine the favorability of APM on a higher level of abstraction. Thus, the study does not delve into the favorability of distinct APM, such as Scrum or Extreme Programming.

Furthermore, due to limited resources, the study is restricted to only investigating challenges that might arise when agile methods and traditional methods coexist within an organization. Thus, the researchers will not explore other areas such as potential benefits organizations that utilize both APM and TPM in parallel can experience.

## 1.4 Report Disposition

The disposition of the report consists of six main chapters. The first chapter is an introduction, which provides the reader with a background of the subject, framing the purpose of the thesis and its corresponding research questions. Thereafter, a theoretical framework is outlined, which includes relevant literature from academia essential to fulfilling the purpose of the thesis. In the third chapter, the method of the study is elaborated upon including quality aspects and ethical considerations. In chapter four, the findings are presented and discussed, followed by a conclusion and implications in chapters five and six.



# 2

## Theory

In this chapter, relevant literature is outlined to provide context to the study and provide guidance for the research questions. First, different project management methods are described. Secondly, prevalent inter-team collaboration and coordination challenges based on previous research are provided.

### 2.1 Project Management Methods

In order to manage projects, organizations tend to apply various techniques, procedures, and methods to accomplish a successful project. Together, these constitute a project management method (Gaborov et al., 2021; Špundak, 2014). For a project management method to be appropriate, it should provide guidance to the project manager throughout the process with the objective to increase the probability of the project being successful (Špundak, 2014). Nevertheless, managing projects is often not easy and the method must be able to address project-specific obstacles (Bergmann & Karwowski, 2019).

Traditionally, project management mainly involved scope definition and thorough planning, before the plan was followed to achieve the established project outcome within the scope of time and budget (Nicholls et al., 2015). Nowadays, more modern methods have evolved to support project management within the new business environment, characterized by its fast pace and uncertainties. One of these methods is agile project management.

An overview of the differences between agile and traditional project management is provided by Dybå and Dingsøy (2008) which can be viewed in Table 2.1. A further overview of the two project management methods is provided in the succeeding sections. Additionally, hybrid project management, which combines elements from the traditional and agile methods is described.

#### 2.1.1 Traditional Project Management

Traditional project management includes a set of various approaches that, for a long period of time, has dominated as the main project management practice (Bergmann & Karwowski, 2019). According to the authors, TPM is from the start depicted by a plan by which projects are executed sequentially with no going back to previous project stages. Furthermore, the project outcomes are declared before the

**Table 2.1:** Traditional vs. agile project management approaches as per Dybå and Dingsøy (2008)

	Traditional	Agile
<b>Fundamental assumptions</b>	Systems are fully specifiable, predictable & can be built through meticulous and extensive planning	High-quality, adaptive software can be developed by small teams using the principles of continuous design improvement & testing based on rapid feedback & change
<b>Control</b>	Process centric	People centric
<b>Management style</b>	Command & control	Leadership & collaboration
<b>Knowledge management</b>	Explicit	Tacit
<b>Communication</b>	Formal	Informal
<b>Customer's role</b>	Important	Critical
<b>Project cycle</b>	Guided by tasks & activities	Guided by product features
<b>Development model</b>	Life cycle model (waterfall, spiral or some variation)	The evolutionary-delivery model
<b>Desired organizational form/structure</b>	Mechanistic (bureaucratic with high formalization)	Organic (flexible and participative encouraging cooperative social action)
<b>Technology</b>	No restriction	Favors object-oriented technology

initiation of the project, including feasible objectives which will support the process (Behrens et al., 2021). The underlying thinking is that organizational mechanisms such as knowledge, and tools should be used so that desired project outcomes can be achieved (Salameh, 2014). Additionally, the method assumes all events which can affect the project are predictable (Ciric et al., 2019).

Although there exist different approaches of TPM such as Waterfall and Stage-Gate, Salameh (2014) claim that it consistently comprises of the different stages *initiating*, *planning*, *executing*, *monitoring*, *control*, and *project closure*. In addition, Salameh (2014), describe that each project is executed by predetermined groups within the project team and that the output from each stage serves as the input to the next activity in line (Bergmann & Karwowski, 2019). Furthermore, each stage in TPM is performed from start to end without iterations or feedback between the stages (Fernandez & Fernandez, 2008) and when a stage is complete it is seldom revisited (Bergmann & Karwowski, 2019). Additionally, projects using TPM work with delivering the final outcome. Collectively, this makes TPM especially suitable for larger projects under project conditions where the end-state is known and when none or

minor project changes are anticipated (e.g., Batra et al., 2010; Boehm & Turner, 2003; Špundak, 2014), and for projects for which the company has established procedures (Fernandez & Fernandez, 2008).

As a consequence of TPM’s transparent structure, a shared understanding of the outcome and the process can be realized (Riesener et al., 2018). In detail, TPM can provide organizations with a stable structure for the project execution (Bergmann & Karwowski, 2019) which enables an organized division of responsibilities and roles amongst the project steps (Thesing et al., 2021). Further benefits of the method are that the project plan and corresponding resource and personnel allocation can be established beforehand which enables a smooth project execution (Fernandez & Fernandez, 2008; McCormick, 2012). Moreover, as project stages and team responsibilities are so well-defined in TPM, it facilitates a structure for handling dependencies between teams in a structured manner enabling international team collaboration (Papadopoulos, 2015).

However, as a plan is established at the beginning of the project, TPM assumes that requirements are settled and as an implication, this leaves little room for changes in later stages (Bergmann & Karwowski, 2019). This is a major drawback of the method since requirements tend to change over time, as clients are not always able to declare all requirements at the beginning of the project (Ciric et al., 2019). Moreover, establishing a detailed plan in today’s ever-changing environment is difficult and according to Noteboom et al. (2021) and Špundak (2014), organizations should instead try to embrace change in order to succeed. For organizations applying TPM, the method’s lack of flexibility to changes can therefore result in costly endeavors such as increased development cost and longer time to market (Behrens et al., 2021; Fernandez & Fernandez, 2008; Špundak, 2014). Moreover, as customers are not able to further extend their requirements, the method can diminish the customer focus resulting in less customer satisfaction (Behrens et al., 2021; Fernandez & Fernandez, 2008).

### 2.1.2 Agile Project Management

Agile project management refers to a set of diverse approaches utilized to manage projects, such as Scrum and Extreme Programming (Papadakis & Tsironis, 2018). With roots in the software industry, APM has evolved to a commonly applied method within multiple industries (Thesing et al., 2021). The nature of APM is formed on the basis of the four values of agile, presented in the Agile Manifesto (Beck et al., 2001):

- **To value individuals and interactions** over processes and tools
- **To value working products** over comprehensive documentation
- **To value customer collaboration** over contract negotiation
- **To value responding to change** over following a plan

In addition to the four values presented, the Agile Manifesto includes twelve supporting principles outlined in Table 2.2. Although the Agile Manifesto was developed

with regards to software development projects, Špundak (2014) claims that the values are applicable for APM as well.

APM is characterized by enhanced collaboration with customers and the ability to adjust to changes. In addition, Bergmann and Karwowski (2019) emphasize the method's incremental nature as a result of multiple planning and development cycles, which allow for continuous adjustment to new requirements and data, thus allowing for continuous improvement. Consequently, the method can be seen as heavily reliant on customer feedback to guide the project direction (Vinekar et al., 2006). According to Nerur et al. (2005), this allows APM to address uncertainties. However, McCormick (2012) highlights sufficient customer involvement as a risk of projects more easily going off track in situations where customers are faced with uncertainty and therefore can not convey what the desired project outcome is. Nevertheless, it is evident that APM is a people-oriented method to managing projects (Bergmann & Karwowski, 2019) and that appropriate utilization of the method can result in multiple advantages for organizations including shortened delivery time, increased customer and stakeholder satisfaction, increased efficiency, and resource-savings (Ciric et al., 2019; Salameh, 2014; Thesing et al., 2021). Additionally, Thesing et al. (2021) highlight the advantage of identifying errors early compared to traditional methods.

Although being described as a revolutionary method, some organizations using APM are facing difficulties. Ciric et al. (2019) claim that there exist organizations that are struggling to achieve agreements with stakeholders and to prioritize the needed work. Consequently, implementing APM into organizations is seen as one of the major challenges of the method. Moreover, there is consensus among multiple authors that one reason for APM implementation failures lies in the organization's culture (Loiro et al., 2019; Papadakis & Tsironis, 2018; Thesing et al., 2021). APM requires a culture that embraces new challenges (Papadakis & Tsironis, 2018) and according to Noteboom et al. (2021) the desire for the method must be both a top-down and a bottom-up initiative. Hence, implementing APM often requires a change in culture and as well-established cultures are difficult and time-consuming to change, many organizations are struggling to implement APM (Boehm & Turner, 2003; Nerur et al., 2005; Papadopoulos, 2015).

An additional reason why APM has resulted in several challenges is the remaining skepticism towards the method, which can result in a lack of management support and sufficient resources needed for the method to be prosperous (Ciric et al., 2019). According to Noteboom et al. (2021), lack of support from management is especially critical to address for the method's success.

Lastly, APM seems to be particularly challenging to implement in larger organizations (Dumitriu et al., 2019; Sommer et al., 2015). According to Bergmann and Karwowski (2019), this can be due to the inflexibility and high degree of systematization and formalization often exhibited by larger organizations. Another reason is, according to Dumitriu et al. (2019) that larger organizations often have multiple



teams pursuing projects simultaneously which results in many interdependencies. Consequently, the authors declare, this can lead to challenges concerning misalignment and knowledge sharing between the teams.

**Table 2.2:** The twelve principles behind the Agile Manifesto as outlined by Beck et al. (2001)

Agile principles	
1	Our highest priority is to satisfy the customer through early and continuous delivery of valuable software
2	Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage
3	Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale
4	Business people and developers must work together daily throughout the project
5	Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done
6	The most efficient and effective method of conveying information to and within a development team is face-to-face conversation
7	Working software is the primary measure of progress
8	Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely
9	Continuous attention to technical excellence and good design enhances agility
10	Simplicity—the art of maximizing the amount of work not done—is essential
11	The best architectures, requirements, and designs emerge from self-organizing teams
12	At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly

### 2.1.3 Hybrid Project Management

To harvest advantages from different project management methods, hybrid project management has evolved as a method. Hybrid refers to a combination of practices and tools from different methods (Bianchi, Conforto, & Amaral, 2021). Consequently, this implies that hybrid can refer to a mix of components from a vast amount of approaches, such as a combination of different agile approaches such as Scrum and Extreme programming (Papadakis & Tsironis, 2018). However, in the literature hybrid is often referred to as the combination of TPM and APM (Bick et al., 2017; Dumitriu et al., 2019; Vinekar et al., 2006), and it is this interpretation of hybrid that will be applied throughout this thesis.

Nonetheless, hybrid should not be seen as a single method that organizations can apply, but rather as a method that incorporates elements from two approaches

in a variety of combinations (Bick et al., 2017). The reason lies in the fact that there is no “*one size that fits all*” and the method should rather be developed for the specific situation (Bianchi, Conforto, Rebentisch, et al., 2021; Gaborov et al., 2021; Špundak, 2014). Hence, the combination of elements, whether more agile should be implemented compared to traditional or vice versa depends on the specific organization and the project environment (Bick et al., 2017). Moreover, the authors claim that hybrid should be viewed as the span between agile and traditional project management as illustrated in Figure 2.1.



**Figure 2.1:** Illustration of the span of hybrid project management

By utilizing hybrid, organizations can become more flexible to changes in requirements while still having established a structure for the project process (Dumitriu et al., 2019). According to Batra et al. (2010), this is one of the major benefits of hybrid, as a lack of structure, which often APM implies, can create confusion within large and complex projects where it is often critical with stable planning and coordination. However, if the organization were to utilize a purely traditional approach, its flexibility to change would be limited. Therefore, balancing agility and stability is of value as it allows an organization to both adopt and optimize (Vinekar et al., 2006). Thus, an appropriate adoption of a hybrid approach can harness benefits from both methods and therefore be more favorable in comparison to APM or TPM (Bianchi, Conforto, Rebentisch, et al., 2021).

However, combining elements from the two approaches that are often viewed as two opposite of extremes can be challenging (Batra et al., 2010). The rationale of the challenges lies in the different and conflicting assumptions of TPM and APM – see Table 2.1 – which needs to be combined in the hybrid approach (Batra et al., 2010; Dumitriu et al., 2019; Vinekar et al., 2006). Specifically, Dumitriu et al. (2019) highlight the challenge of establishing self-organized teams in a strict and controlling environment that characterize traditional projects. Therefore, the authors add, it is a possibility that hybrid should be viewed more as a challenge and not as the solution it is portrayed as by many authors. However, multiple authors argue that bipolar approaches can be combined and generate benefits if adopted in the right circumstance (Batra et al., 2010; Riesener et al., 2018). Furthermore, it is also argued that organizations often adopt hybrid due to the difficulties of implementing APM (Bianchi, Conforto, & Amaral, 2021; Bianchi, Conforto, Rebentisch, et al., 2021; Gemino et al., 2021).

## 2.2 Project Management Success

When deliberating on project management success, one must first distinguish it from project success. The two concepts are strongly related to one another and in a

study by Shokri-Ghasabeh and Kavooosi-Chabok (2009), 43% of the 65 respondents consisting of Ph.D. students within project management, project management professionals, and project managers, viewed the two as identical. The confusion around the concepts is not surprising as both consider the achievements of projects (Munns & Bjeirmi, 1996). This has resulted in multiple studies investigating how a distinction can be made between them (Papke-Shields et al., 2010).

From the research, it is detailed that project management success involves measurements throughout the project's process and is evaluated at the end (Andersen et al., 2006; Cooke-Davies, 2002; Papke-Shields et al., 2010). Furthermore, multiple authors declare that the success of project management is typically measured with the criteria, time, cost, and quality, generally referred to as the iron triangle (e.g., Cooke-Davies, 2002; Pollack et al., 2018; Radujković & Sjekavica, 2017; Zid et al., 2020).

In contrast, project success is viewed as a wider concept, evaluated against the project's objectives (Gomes & Romão, 2016). Moreover, project success also incorporates the long-term impact of the project throughout its life (Andersen et al., 2006; Munns & Bjeirmi, 1996). However, unlike project management success, there exist no general criteria of how project success is measured (Khan & Spang, 2011). Traditionally, project success was measured with the iron triangle (Bergmann & Karwowski, 2019) and some authors still see them as central when evaluating project success (Serrador & Pinto, 2015). However, most authors view the iron triangle as conventional and argue that project success includes many more aspects (e.g., Gomes & Romão, 2016; Irfan et al., 2019; Tam et al., 2020). For instance, Shokri-Ghasabeh and Kavooosi-Chabok (2009) and Noteboom et al. (2021) argue that project success should also include internal and external stakeholders' satisfaction while Pollack et al. (2018) emphasize achieving strategic business objectives. Additionally, Andersen et al. (2006) highlight the importance of gaining knowledge from the project as this will aid future undertakings.

The view of project success being a wider concept than project management success aligns with the proposed relationship between the concepts that project management success is a subset of project success (Andersen et al., 2006; Munns & Bjeirmi, 1996; Radujković & Sjekavica, 2017). This is reinforced by the fact that a project can be regarded as a failure although project management is deemed successful (Andersen et al., 2006). Contrariwise, a project can be successful by satisfying wider objectives, although the project exceeds its resource budget and thereby fail in regards to project management (Radujković & Sjekavica, 2017). Thus, achieving project management success can boost project success, but it is not the ultimate cause of it.

### 2.3 Inter-team Collaboration & Coordination Challenges

Within organizations, teams, regardless of method applied, often need to collaborate and coordinate with other teams in order to achieve desired outcomes. In detail, the need for coordination between teams may be due to changes in the process and interdependencies (Gustavsson, 2020; Rolland et al., 2016) that regard how activities, requirements, and resources affecting several teams are organized and orchestrated (Dingsøyr et al., 2018). Therefore, coordination is often described as the process of managing dependencies (Dingsøyr et al., 2018). Achieving inter-team collaboration effectively is important as organizations otherwise can face delays, frustrations, quality issues, and rework (Bjarnason et al., 2022). However, inter-team coordination is not effortless as it encompasses various challenges, such as lack of communication and alignment issues (Vlietland & van Vliet, 2015). Therefore, organizations need to mitigate these challenges to achieve effective and efficient inter-team collaboration and coordination (Bick et al., 2017). Furthermore, the emphasis on achieving effective inter-team collaboration is especially evident in environments where APM is used to manage projects (Bick et al., 2017; Uludag et al., 2018) as multiple self-organized agile teams often imply a great deal of dependencies between them (Bjarnason et al., 2022). In this section, the prevalent inter-team challenges identified in the literature are outlined and later synthesized.

#### 2.3.1 Prevalent Challenges from the Literature

A prominent challenge mentioned by several authors is that teams do not always know to which teams they are connected, meaning that a lack of awareness of dependencies exists which hinders effective collaboration (Bick et al., 2017; Stray et al., 2019; Vedal et al., 2021). This challenge is especially apparent between agile teams, but can according to Theobald and Diebold (2018) be even more complex in the interface between agile and traditional teams. Despite the project management method applied it is fundamental that teams must recognize having dependencies in order to handle them (Babinet & Ramanathan, 2008). After all, if teams lack knowledge of the activities and projects of other teams within their organization, it creates a situation of *de facto* not being able to manage dependencies (Stray et al., 2019). This can lead to situations where entire teams are held back from completing their tasks which in turn can decrease teams' efficiency, cause misalignment and cause several escalations for the project such as delays (Bick et al., 2017).

Although known dependencies can restrict planning and be burdensome, unknown dependencies pose even greater coordination challenges for teams which increases the workload and creates delays (Evbota et al., 2016). Specifically, lack of awareness causes teams to be unaware of other teams' activities (Bick et al., 2017) which in turn can cause misunderstandings and affect the project outcome (Rolland et al., 2016; Stray et al., 2019). In contrast, if teams instead were aware of dependencies, the coordination and timing of tasks between teams would be smoother (Cadiz et al., 1998; Espinosa et al., 2007). Moreover, it has been emphasized that recognizing

dependencies at as early a stage as possible is essential to not have to re-do work from previous teams, and to reduce the integration risks with other teams (Martakis & Daneva, 2013). Nevertheless, being aware of dependencies is troublesome, and is a task that requires a thorough understanding and contextual knowledge providing further complexity to the coordination challenge caused by dependency unawareness (Cataldo et al., 2007). Moreover, a team's and organizational setting's size can further increase the issue of lack of awareness (Babinet & Ramanathan, 2008; Vedal et al., 2021). Hence, simply having an organization with a too great amount of dependencies might cause the organization and its teams to lose control over them, resulting in a lack of dependency awareness (Dikert et al., 2016). Additionally, being aware of dependencies has proven to be especially challenging in large-scale agile organizations, where development is done concurrently (Kalenda et al., 2018; Stray et al., 2019) and where the scaling can cause teams to lose track of dependencies (Uludag et al., 2018). Thus, the issue is of greater importance in large organizations with multiple teams collaborating simultaneously.

Another challenge that affects inter-team collaboration and coordination concerns a team's understanding of other teams' knowledge and corresponding capacity (Björnson et al., 2018; Espinosa et al., 2007). Having reached a state of mutual understanding of other teams, which for example involves being informed of other teams' activities, and knowledgeable of others' task domains is an important facilitator for efficient inter-team coordination (Espinosa et al., 2007). Not having the common ground of understanding described or if teams are not aware of each other's work, cognitive distance in between teams can arise (Bjarnason et al., 2022; Björnson et al., 2018). Further, dissimilarities in knowledge regarding a system and lack of information-sharing between teams are examples of additional circumstances that can create cognitive distances (Bjarnason et al., 2022). In detail, lack of understanding can cause teams to assume that what others are doing is complicated, which gives rise to a cognitive distance (Bjarnason et al., 2022). Besides decreasing the efficiency of inter-team collaboration, such distance can result in undesired outcomes and undesirable designs in development projects (Badampudi et al., 2013).

Another issue included as a factor in lack of understanding concerns the knowledge of essential terminology in a project. When teams are proficient in the common terminology, this eases inter-team coordination and collaboration (Espinosa et al., 2010) which might be why cognitive distances decrease between teams that execute the same type of work (Bjarnason et al., 2022). Moreover, different understandings of concepts can besides misconceptions cause various interpretations of ways of working, project assignments, and working procedures. For instance, lack of understanding can cause teams to employ frameworks differently in a company (Conboy & Carroll, 2019). As stated by a respondent in Conboy and Carroll (2019, p. 45) study: *"In the absence of something clear and definitive, people just continue to do the same thing they always did"*. This further signifies the inter-team challenge caused by a lack of understanding.

Nonetheless, mitigating lack of understanding can be challenging as it might require

teams to place additional effort to communicate more often to make sure enough knowledge is shared between them and a mutual understanding is instilled (Bjarnason et al., 2022; Bjørnson et al., 2018). For instance, the authors state that this requires teams to be extensively aware of each other. Furthermore, teams might need to participate in other team's meetings which is a time-consuming task but will allow them to be informed not only about the team's undertaking but also their proceeding and prioritization in projects (Begel et al., 2009). However, if the knowledge is acquired, the interconnections of projects, teams, and overarching knowledge become clearer, which in turn increases the efficiency of inter-team coordination and collaboration (Damian et al., 2013).

Studies also show that communication issues can hinder the coordination and collaboration between teams. Several of these issues relate to whether teams are distributed or not (Stray & Moe, 2020) as distance adds additional barriers between different teams that need to collaborate (Noll et al., 2010). For instance, the absence of informal encounters to exchange information is seen as essential even though meetings in distributed settings can be scheduled in frequent intervals (Stray & Moe, 2020). Additionally, the absence of informal encounters and the distance can make it harder for team members to develop personal relationships (Noll et al., 2010), something that is often viewed as a necessity to coordinate work successfully between teams (Bjarnason et al., 2022; Bjørnson et al., 2018; Evbota et al., 2016). A potential reason is the lack of face-to-face meetings, decreasing employees' opportunity to establish trust and form connections (Noll et al., 2010; Stray & Moe, 2020). The importance of personal relationships between employees as a means to facilitate coordination is further emphasized in a study by Begel et al. (2009), where approximately 87% of the respondents agreed that personal connections are helpful. Nonetheless, relying on personal relationships to solve the communication issues can be contradictory since these relationships are influenced by power relations and personal interests which may be conflicting (Wohlrab et al., 2019).

Another communication challenge, which is more likely to occur when teams are distributed globally, is delays in information (Badampudi et al., 2013; Stray & Moe, 2020). One reason is that distributed teams often communicate with each other less (Badampudi et al., 2013; Stray & Moe, 2020), while another reason can be that teams work in different time zones (Noll et al., 2010). For instance, if one team sends a request or question to another team in another time zone that arrives after working hours, this will not be answered until the next workday (Noll et al., 2010). Additionally, different time zones complicate the scheduling of meetings (Wohlrab et al., 2019), making it harder to collaborate efficiently. Thus, the collaboration between distributed teams places a larger emphasis on meetings to communicate, which can be especially challenging when teams are spread out (Stray & Moe, 2020).

On the contrary, when teams are co-located in the same work environment the opportunity for communication is greater (Evbota et al., 2016). Despite this, the authors state that an open work environment, which fosters communication as teams are located in the same office space, can result in other challenges such as teams

being distributed more easily. Moreover, although teams are able to communicate more easily, personal preferences of communication channels can cause inter-team challenges (Bjarnason et al., 2022). For instance, if one team prefers face-to-face communication, another team might prefer to communicate by email. Consequently, different preferences can result in a team not being aware of the interaction from another (Bjarnason et al., 2022).

In close connection, Paasivaara and Lassenius (2011) explain that a challenge when teams communicate is the different perceptions among employees of how the communication channels should be utilized. This can cause both intra- and inter-communication issues (Paasivaara & Lassenius, 2011). Moreover, Evbota et al. (2016) state that another issue concerning communication channels is the lack of suitable ones. This aligns with the findings of Paasivaara and Lassenius (2011), which discovered that some team members express concerns regarding common meetings, claiming that these were not able to help them coordinate with other teams in a better way. Consequently, lack of suitable channels can hinder team members from sharing information with each other (Evbota et al., 2016; Nguyen-Duc et al., 2015).

Another challenge identified as a communication issue is cultural differences (Bjarnason et al., 2022; Nguyen-Duc et al., 2015; Noll et al., 2010). This issue can be a barrier and cause misunderstandings when teams communicate with each other (Nguyen-Duc et al., 2015). For instance, cultural differences can imply that the organization lacks a common language, which in turn makes communication harder (Noll et al., 2010). Additionally, cultural differences can result in challenges even if teams use a common language. As previously mentioned, cultural differences can cause a lack of understanding resulting in misinterpretations and different ways of solving problems, but it can also make it harder for teams to communicate with each other (Noll et al., 2010), hence resulting in a communication issue. Moreover, a strong culture within the team can create boundaries that decrease the efficiency of inter-team communication (Bjarnason et al., 2022). Further, the authors state that this is especially evident when APM is applied, as this method highly emphasizes a strong intra-team collaboration culture.

Finally, differences in language capability are also viewed as a communication issue affecting inter-team collaboration (Nguyen-Duc et al., 2015; Noll et al., 2010). For instance, this issue can make some team members more prone to use a specific communication channel (Nguyen-Duc et al., 2015). For instance, some members which have a lower level of proficiency in the common language may prefer text-based media such as email, rather than telephone communication as this will allow them more time to compose their questions and responses (Noll et al., 2010). As already stated, this can result in issues due to different preferences of communication channels. Moreover, employees with stronger language skills can often seem more powerful and as a result, unintentionally hold back communication from those with fewer skills (Noll et al., 2010). This further aligns with the concern with relying on personal relations to solve communication issues.

Another challenge that needs to be managed in order for teams to collaborate efficiently is lack of alignment (e.g., Gustavsson, 2020; Vlietland & van Vliet, 2014; Wohlrab et al., 2019). This challenge concerns various areas where misalignment can be devastating for inter-team collaboration. For instance, for efficient inter-team collaboration to occur, teams must have a common vision and align their interests (Wohlrab et al., 2019). Alignment in these areas is even seen by authors as a critical aspect for a project to succeed (Vlietland & van Vliet, 2015). However, achieving a shared vision and aligned objectives is challenging due to the involvement of multiple stakeholders who need to agree with each other (Evbota et al., 2016).

Furthermore, without aligned objectives between teams, it is hard to achieve alignment in how teams prioritize (Vlietland & van Vliet, 2014) which is another area often mentioned in connection to misalignment (e.g., Babinet & Ramanathan, 2008; Bick et al., 2017; Vlietland & van Vliet, 2015). For instance, in agile teams, the prioritization of tasks is often determined by product owners that can have different objectives which can vary depending on which manager they belong to (Vlietland & van Vliet, 2015). Thus, if the objectives vary, there will likely be a misalignment in prioritization in how teams view tasks to another.

Nonetheless, misalignment in prioritization can occur even if the alignment of a common objective exists between teams. For instance, if a task dependency exists between two teams, where one team is dependent on another to perform a specific task, these teams must agree on a common prioritization for efficient coordination to be possible (Babinet & Ramanathan, 2008). Still, if the teams have different views on the priority of the task this can result in increased time to market and frustration (Vlietland & van Vliet, 2014). Different views on prioritization can occur when there is a lack of information, which means that teams prioritize tasks without having the full picture (Evbota et al., 2016). This is hard to mitigate, as it is impractical for teams to share all available information among employees in an organization while it is also hard for employees to create an understanding of all information that exists (Evbota et al., 2016).

An additional reason for misalignment in prioritization between teams is due to the intra-team focus that often exists which means that teams often prioritize their own back-log (Badampudi et al., 2013; Vlietland & van Vliet, 2014) regardless of the rest of the organization. Moreover, misalignment can occur due to rapid changes in requirements or when requirements are unclear, which can make it hard to prioritize (Evbota et al., 2016). Additionally, dependencies can exist between several teams, which further enhances the challenge to prioritize requirements accordingly (Evbota et al., 2016). Although it is challenging, it is essential to keep the prioritization clear and updated to avoid conflicts (Paasivaara et al., 2012).

Lastly, another alignment issue, not as widely discussed, but which yet can occur although objectives and prioritization between teams are clear is misalignment regarding *Definition of Done* (Vlietland & van Vliet, 2014), which is a set of criteria



that must be completed before a task is viewed as done (Silva et al., 2017). In a study by Vlietland and van Vliet (2014), it was discovered that teams often utilize different definitions. Consequently, misalignment can result in different routines and technical inconsistency between teams (Berntzen et al., 2021). The challenge of aligning the *Definition of Done* between teams is further highlighted by Berntzen et al. (2021) and Vlietland and van Vliet (2015).

### 2.3.2 Synthesis of Challenges from the Literature

The prevalent challenges found in the literature have been synthesized in Table 2.3, where the respective challenge is illustrated further with a few examples.

**Table 2.3:** Inter-team coordination and collaboration challenges deduced from literature and segmented into categories

Challenges	Examples Illustrating the Challenge
<b>Lack of Dependency Awareness</b>	<b>Example 1:</b> Teams do not always know to which teams they are connected which hinder effective collaboration (Bick et al., 2017; Stray et al., 2019; Vedal et al., 2021)
	<b>Example 2:</b> Being aware of dependencies is a task that requires a thorough understanding and contextual knowledge (Cataldo et al., 2007)
	<b>Example 3:</b> Organizations with a too great amount of dependencies might cause the organization and its teams to lose control over them (Dikert et al., 2016)
	<b>Example 4:</b> Not having the appropriate awareness of dependencies when dealing with complex projects can cause misunderstandings and thereby affect the project outcome (Rolland et al., 2016)
<b>Lack of Understanding</b>	<b>Example 1:</b> Lack of understanding can cause teams to assume that what others are doing is complex, giving rise to a cognitive distance which decrease the efficiency of inter-team collaboration (Bjarnason et al., 2022)
	<b>Example 2:</b> Besides misconceptions, different understandings of concepts can cause various interpretations of ways of working, project assignments, and working procedures (Conboy & Carroll, 2019)
	<b>Example 3:</b> Gaining knowledge of other teams is a time-consuming task (Begel et al., 2009)
<b>Communication Issues</b>	<b>Example 1:</b> Lack of informal encounters is a barrier for distributed teams as it hinders trustful relationships and often leads to less inter-team communication (Noll et al., 2010; Stray & Moe, 2020)
	<b>Example 2:</b> Cultural differences can cause misunderstandings and create boundaries between teams, hindering efficient collaboration (Nguyen-Duc et al., 2015; Noll et al., 2010)
Table Continues on Next Page	

Continuation of Table 2.3

Challenges	Examples Illustrating the Challenge
	<b>Example 3:</b> Personal preference of communication means, different levels of language proficiency, and lack of suitable communication channels hinders efficient inter-team communication (Bjarnason et al., 2022; Evbota et al., 2016; Noll et al., 2010)
<b>Misalignment Issues</b>	<b>Example 1:</b> Misaligned objectives and lack of information can cause teams to prioritize tasks differently, consequently resulting in frustration and delays (Evbota et al., 2016; Vlietland & van Vliet, 2014)
	<b>Example 2:</b> Intra-team focus causes teams to prioritize their own back-log (Badampudi et al., 2013; Vlietland & van Vliet, 2014) regardless of the rest of the organization
	<b>Example 3:</b> Different definitions of <i>Definition of Done</i> can cause differences in routines and technical inconsistency (Berntzen et al., 2021; Vlietland & van Vliet, 2014)

# 3

## Method

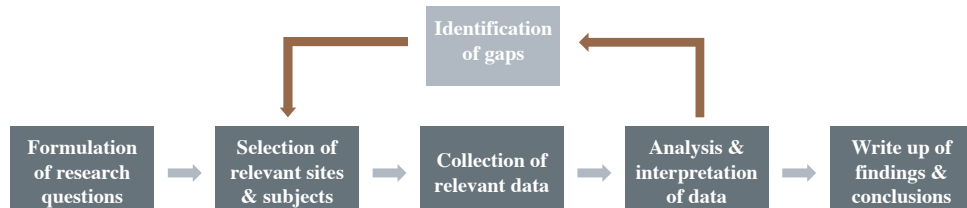
This chapter introduces the research strategy, design, and methods used in the thesis and the reasoning behind them. In addition, the research quality and ethical considerations of the thesis are discussed.

### 3.1 Research Strategy

According to Bell et al. (2019), a research strategy accounts for the approach by which a study is conducted. Generally, there are two main strategies associated with different research orientations, namely quantitative and qualitative (Bell et al., 2019). A quantitative research strategy, typically entailing a deductive relationship linking theory and reality, is a strategy aimed to test theories. Contrariwise, qualitative research often takes an inductive approach to theory (Bell et al., 2019) and is especially suitable for research that will collect and analyze words to generate new theories (Kaplan & Maxwell, 2005), which aligns with the intention of this thesis.

In more detail, the rationale behind the choice of a qualitative strategy was the thesis's aim to, through the research questions posed, generate theory that provided answers to when agile is more favorable and to identify potential challenges that could arise as a result of utilizing different project management methods within an organization. Hence, a qualitative study with an inductive approach was appropriate since new theory was the outcome of the research, generated from collecting and analyzing non-numerical data as described by Bell et al. (2019).

Additionally, a qualitative research strategy is described as flexible and iterative (Kaplan & Maxwell, 2005). This further strengthens the choice of a qualitative strategy, as the process followed in this thesis is not sequential but rather iterative based on the general process described by Bell et al. (2019) – see Figure 3.1.



**Figure 3.1:** Illustration of the research process applied in this study based on the general process for qualitative research by Bell et al. (2019)

## 3.2 Research Design

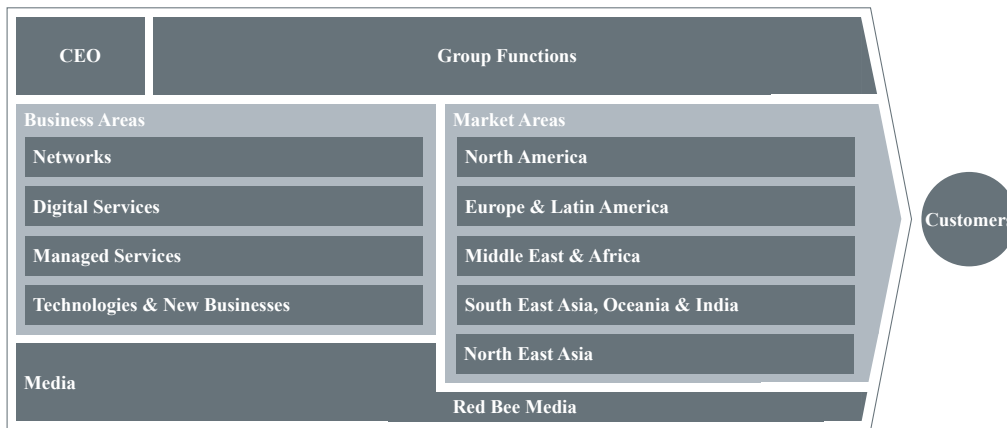
A research design serves the function of guiding the data collection and thus the chosen research methods by providing a structure for it (Bell et al., 2019). By considering the purpose of the study and the research questions, a literature study was chosen to answer the first research question, when agile is favorable to use. Hence, an answer to the question was derived by primarily analyzing several published articles on the topic.

In parallel, a case study was chosen as it was deemed the most appropriate research design to answer the second research question, to identify challenges that could arise within an organization as a result of the usage of APM and TPM. In detail, a case study implies that a single case of interest for the research, such as a unit or organization, forms the basis of the study and is therefore appropriate when an organization is thoroughly studied (Gerring, 2004).

Further influencing the choice of a case study for the second research question were practical considerations, as the thesis emerged from an exchange with the Telephone Stock Company of LM Ericsson, henceforth referred to as Ericsson. This implied that the study relied on Ericsson for resources, specifically the opportunity for data collection. Hence, Ericsson is the investigated case and thus formed the basis of the study.

### 3.2.1 Empirical Context

This study took place at Ericsson which is a large firm in the information and communications technology (ICT) industry. Since its foundation in 1876, Ericsson has grown into a leading ICT provider with annual revenue of 232.4 billion SEK in 2020 and about 100 thousand employees globally, 14 thousand in Sweden (Ericsson, 2021). To fulfill their purpose, *to create connections that make the unimaginable possible*, Ericsson yearly pursues various types of projects to deliver high-technology products, software, and services to the market such as roll-outs of cellular towers and Internet of Things (IoT) solutions (Ericsson, 2021). Further, Ericsson has a matrix-like organizational structure that includes four business areas, five market areas, and numerous group functions (Ericsson, 2021). The organizational structure is illustrated in Figure 3.2. In short, the four business areas are responsible for providing Ericsson with business solutions that can compete in the market (Ericsson, 2021). In turn, these solutions are to be sold and delivered by the five market areas. Lastly, the group functions provide support to the market and business areas by coordinating work, driving synergies, and the agenda of Ericsson.



**Figure 3.2:** Illustration of Ericsson’s organizational structure

To manage its projects, Ericsson has long used traditional approaches such as PROPS, developed by the firm itself, as well as XLPM where both methods can be described as a traditional Stage-Gate process. Lately, Ericsson has implemented cross-functional teams that consist of employees with varying functional expertise, such as employees from differing organizations within the firm, for instance as *Group IT* and *Group Supply*. The teams were created to help develop Ericsson’s digital capabilities by addressing specific parts of the customer journey from when an order is placed to final delivery and after-sales services. More specifically, the teams were part of and pioneers in Ericsson’s initiative to shift towards agile across parts of the firm to keep up with today’s new business environment.

Despite the adoption of agile to manage projects, there still are teams within Ericsson that pursue projects with a more traditional approach. Therefore, Ericsson can be viewed as a firm that applies different project management approaches depending on the specific situation, thus not having a standard project management method across the firm. Ericsson was viewed as an appropriate firm for this thesis as the purpose and aim was to understand when agile project management is more favorable compared to a more traditional approach, and what potential challenges can arise when different project management methods coexist within an organization.

In detail, several organizations within Ericsson make up the foundation of the case in this study. The reason why the case is not limited to one or two units is that the division of teams applying APM and TPM differs within Ericsson’s organizations. For instance, APM is the primary method for the cross-functional teams and within the organization *Group Digital Transformation Office (DTO)*, where work to digitally transform processes is conducted, while TPM is more commonly used within the organization *Group Supply*, primarily responsible for planning and orchestration of the supply chain. Therefore, representatives from several organizations are included as the researchers deemed this would increase the reliability of the results. However, due to the limitations of the study in resources and time, as well as the size of Ericsson, not all areas can be covered. Moreover, as the study emerged from an exchange with the organization *Group Supply* at Ericsson, that is where the main

focus is due to practical considerations. Additionally, the focus is primarily on organizations affiliated with Ericsson's business areas, since these are responsible for developing products and solutions. Nonetheless, representatives from market areas are also included to cover the collaboration between these areas, i.e. – market areas and business areas.

## 3.3 Research Methods

In this section, the research methods used in the thesis – literature review & empirical data collection methods – and the rationale behind the choices are described. The thesis was initiated with a literature review, for the researchers to gain an understanding of the research area. Thereafter, the case study was initiated by collecting empirical data at the studied firm. In parallel, the literature study, consisting of an extensive literature review was performed in order to provide an answer to the first research question, when it is favorable to apply APM.

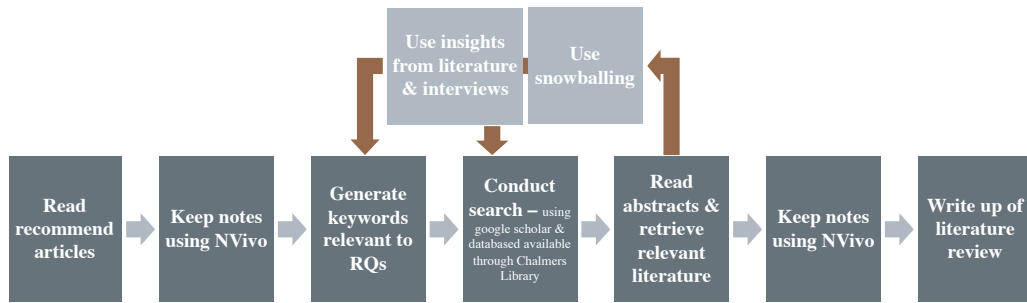
### 3.3.1 Literature Review

A literature review refers to the process of gathering and synthesizing research available and can be conducted for several reasons and in various ways (Bell et al., 2019; Snyder, 2019). In this thesis, the purpose of a literature review was to identify relevant data for the literature study aimed at answering the first research question. Additionally, it was used in the case study to establish an understanding of the research field and to facilitate the analysis of the gathered empirical data, supporting the answering of the second research question.

Within the qualitative realm, narrative reviews are typically used due to their specific suitability for qualitative research (Bell et al., 2019). Furthermore, it is regarded that such a review is custom for research areas that have been studied in various contexts (Snyder, 2019), which aligns with the purposes of the literature review for this thesis. Moreover, a narrative review is advisable for studies with fewer restrictions regarding the boundaries of the review and thus allow for greater flexibility as these can be modified throughout the process (Bell et al., 2019). Therefore, this thesis used a narrative review where findings from the empirical data collection methods provided guidance to new relevant areas in both studies, i.e., – the literature study & the case study.

To identify relevant literature, this thesis followed the process illustrated in Figure 3.3 which is based on Bell et al. (2019)'s general process. Thus, the literature review was initiated with articles recommended by the supervisor at Chalmers who possessed academic knowledge in the specific field. Hereafter, keywords relevant to the research questions were generated which allowed for further literature to be identified through Google Scholar and the databases available through Chalmers Library. The literature search was continuously revised and narrowed as the literature and empirical findings provided more direction. Additionally, to further facilitate the identification of relevant literature, snowball sampling, which is a method that

through the reference list of already identified literature helps researchers discover further literature (Bell et al., 2019), was used.



**Figure 3.3:** Illustration of literature review process applied in this study based on the general process by Bell et al. (2019)

### 3.3.2 Interviews

In qualitative research, there are various ways to collect empirical data, where one of the most common data collection methods is interviews (Bell et al., 2019). Interviews are advantageous to use compared to other methods such as observations, as they allow a specific focus while simultaneously ensuring that the study has a wide coverage by interviewing diversified roles (Bell et al., 2019). For this reason, interviews were chosen as the primary method to collect empirical data from the studied firm in the case study. Additionally, the interviews were conducted online due to practical implications, such as the fact that the researchers were located in another city and that a large part of the firm still works from home due to COVID-19. Thus, online interviews were considered the most appropriate way to collect data during the given circumstances.

Normally, interviews in qualitative research are less structured to allow for more flexibility and to ensure essential thoughts and perspectives from the interviewees are captured (Bell et al., 2019; Jenner et al., 2004). Typically, qualitative interviews are divided into unstructured and semi-structured (Bell et al., 2019), where the latter is used in this case study. The rationale behind this decision is that semi-structured interviews, compared to unstructured, allow for some comparability between interviews when they, at a later stage, are being analyzed while simultaneously ensuring relevant topics are touched upon in the interviews (Bell et al., 2019). Lastly, semi-structured interviews are preferable when the interview is conducted by more than one person (Bell et al., 2019), which was the case in this thesis, as one researcher was responsible for taking notes while the other researcher led the interview.

Furthermore, when using semi-structured interviews it is recommended to have an interview guide that includes the main themes that the interview aims to capture Bell et al. (2019). Additionally, the authors suggest that the guide follows a few baselines such as developing the guide from the study's research questions, ensuring that there is an order in the line of questioning, and a balance in the language.

Moreover, a guide should not include any leading questions and the question asked about the interviewee should be relevant (Bell et al., 2019). With these considerations in mind, an interview guide was developed – see Appendix A – and used during all conducted interviews.

Additionally, it is of importance to consider the process of how interviewees are selected. To initiate the sampling process, the supervisor at the studied firm proposed a few potential interviewees. Thereafter, the study used purposive sampling, which is a non-probability sampling technique, typically used within qualitative research, where the selection is done with the aim of the research in mind (Bell et al., 2019). Purposive sampling is further regarded to increase the representativeness amongst interviewees chosen and can also help display eventual heterogeneity within groups (Maxwell, 2012), which strengthened the choice of a purposive sampling technique as various roles within the studied firm were desired to gain a more honest depiction.

In detail, purposive sampling can be divided into various forms where primarily theoretical sampling and snowball sampling was used in this study. Theoretical sampling can further be described as an iterative process where data is collected based on previous sampling (Bell et al., 2019) which aligns with this thesis' aim, where interviewees were deliberately chosen based on their appropriateness. Additionally, theoretical sampling entails theoretical saturation, meaning that researchers are able to evaluate throughout the data collection process whether further data is needed (Bell et al., 2019). This further emphasized the choice of the sampling method, as the researchers concluded the interview process when they felt that data saturation was achieved, meaning that gathered data from following interviews did not indicate any new information critical to answering the research questions. Additionally, snowball sampling influenced the sampling process as it allowed potential interviewees to be identified from already conducted interviews (Bell et al., 2019).

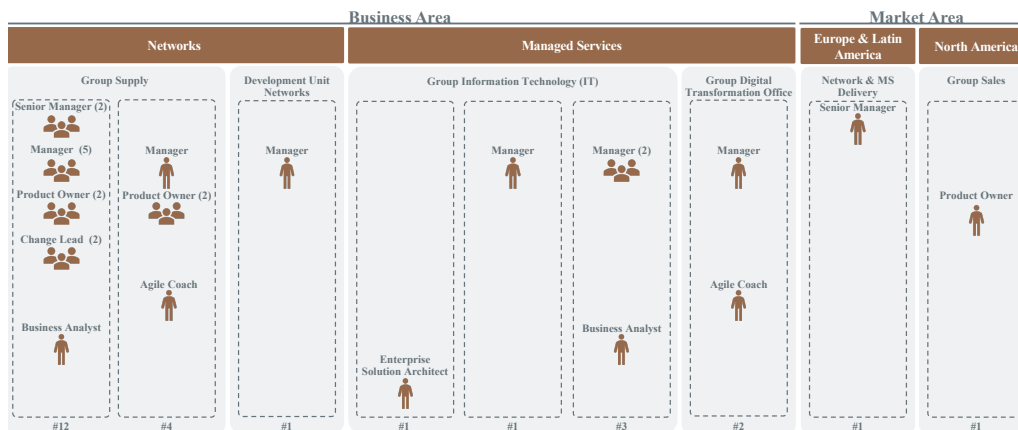
Noteworthy, the sampling process was also influenced by convenience sampling, which is a technique where interviewees are chosen based on their availability (Bell et al., 2019). This practice was applied due to the study's time limitation, meaning that only employees who were available during the allotted time for the interview process were interviewed.

At the end of the process, 26 semi-structured interviews with a length of one hour each had been conducted. The interviews were conducted using the video conferencing tool *Microsoft Teams*, which allowed the interviews to be performed in a, for the interviewees, familiar setting as suggested by Bell et al. (2019). Moreover, all interviews for which consent was given by the interviewee were audio-recorded to ensure details were captured in their entirety. Worth mentioning is that a majority of the 26 interviews were held in Swedish as this is the native and preferred language of most interviewees. In Table 3.1 all conducted interviewees are listed with their respective roles and the organization within Ericsson they belong to. However, to mitigate the risk of interviewees being identified, any detailed role titles have been changed to general role titles. For instance, the role of a Manager is applied to describe



both Line Managers, Product Managers, and Process Managers. Additionally, only the overarching organization is represented in the table for the same confidentiality reasons. To distinguish interviewees who belong to the same overarching function, but different sub-organizations, a segment name has been added after the name of the organization to visualize this, i.e., – segment A, B, C.

For an additional overview of the areas and roles covered in the studied firm during the interviews see Figure 3.4. From the Figure, it can be depicted that two out of four business areas, namely *Networks* and *Managed Services*, and two out of the five market areas, namely *Europe & Latin America* and *North America*, are represented in the study. Additionally, the Figure shows that six organizations in total, some with affiliated sub-organization, jointly measured to nine, are represented in the study. Noteworthy is that although an organization is affiliated with a specific market or business area, the scope of the organization can imply that its business extends to other areas. For instance, *Group Supply* formally belongs to the business area *Networks*. However, the group function is responsible for supply chain planning and orchestration all the way from new product introduction through manufacturing and distribution to finally preparing their customers' supply chains across all of Ericsson's business and market areas. Hence, although not all Ericsson's business and market areas are formally covered, due to the limitation in time and scope of this study and the large size of Ericsson, the researchers have done their best to cover a wide range of areas and some of their associated sub-organizations to provide a foundation for the analysis.



**Figure 3.4:** Illustration of roles interviewed at Ericsson

Additionally, interviews have been performed with multiple roles, three Senior Managers, 11 Managers, four Product Owners, three Change Leads, two Agile Coaches, two Business Analysts, and one Enterprise Solution Architect. Noteworthy is that although several interviewees are classified as Senior Managers and Managers, a majority of these have experiences from previous roles such as a Product Owner or a Team Member, as they have been at Ericsson for a long time. Their long experience was also valuable as they could provide a perspective on what it was like before Ericsson adopted APM, and provide a comparison between then and now. Therefore, the division of roles interviewed can initially be considered unbalanced,

although the researchers have deliberately chosen to interview employees with long experience, as a limited number of interviews could only be conducted due to the study's limitation in time and resources. Another thing worth mentioning again is the fact that the interviewees' role titles have been adjusted to general roles, where many interviewees were given the title of Managers as they had responsibility for others, compared to for instance Business Analysts that are primarily viewed as team members. Consequently, the range of areas and roles combined – see Figure 3.4 – provide a substantial foundation for the analysis conducted in this study.

**Table 3.1:** Table of interviews conducted in this study

	Role	Affiliation	Date
1	Manager	Group Supply – <i>Segment A</i>	2022-02-15
2	Product Owner	Group Supply – <i>Segment A</i>	2022-02-16
3	Enterprise Solution Architect	Group IT – <i>Segment A</i>	2022-02-16
4	Change Lead	Group Supply – <i>Segment A</i>	2022-02-17
5	Product Owner	Group Supply – <i>Segment B</i>	2022-02-18
6	Manager	Group Supply – <i>Segment A</i>	2022-02-21
7	Senior Manager	Group Supply – <i>Segment A</i>	2022-02-22
8	Manager	Group IT – <i>Segment B</i>	2022-02-22
9	Business Analyst	Group IT – <i>Segment C</i>	2022-02-23
10	Product Owner	Group Sales	2022-02-24
11	Senior Manager	Group Supply – <i>Segment A</i>	2022-02-24
12	Manager	Group IT – <i>Segment C</i>	2022-02-24
13	Manager	Group Supply – <i>Segment A</i>	2022-02-24
14	Senior Manager	Network & MS Delivery	2022-02-25
15	Product Owner	Group Supply – <i>Segment B</i>	2022-02-25
16	Manager	Group Supply – <i>Segment A</i>	2022-02-28
17	Manager	Group Supply – <i>Segment A</i>	2022-03-02
18	Agile Coach	Group DTO <sup>1</sup>	2022-03-02
19	Business Analyst	Group Supply – <i>Segment A</i>	2022-03-03
20	Manager	Development Unit Networks	2022-03-03
21	Manager	Group IT – <i>Segment C</i>	2022-03-04
22	Manager	Group DTO <sup>1</sup>	2022-03-07
23	Change Lead	Group Supply – <i>Segment A</i>	2022-03-07
24	Agile Coach	Group Supply – <i>Segment B</i>	2022-03-08
25	Manager	Group Supply – <i>Segment B</i>	2022-03-14
26	Manager	Group Supply – <i>Segment A</i>	2022-03-15

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1: Digital Transformation Office

### 3.3.3 Other Empirical Data

To facilitate the understanding of the contextual situation, internal documents provided by Ericsson regarding the firm were utilized. These documents include how the firm and its organizations deploy agile and traditional ways of working, and how Ericsson is structured, which provided the researchers with an understanding of the context of the case prior to the interviews. Additionally, documents regarding organizational structure were used to provide an understanding of which part of the organization the interviewees belong to. This was used both to map already conducted interviewees and to find new potential participants which can potentially provide another perspective.

## 3.4 Data Analysis

Analysis of qualitative data primarily involves the identification of categories and concepts in data, which often can be laborious due to its commonly unstructured nature (Bell et al., 2019; Vaismoradi et al., 2016). Although no general rules regarding qualitative data analysis exist, many researchers within the qualitative realm deploy coding as an approach for analyzing data (Vaismoradi et al., 2016). In this thesis, coding was deployed in parallel with the data collection to facilitate both the collection and the process of analyzing data (Bell et al., 2019).

To analyze the data gathered from the case study, interview notes were initially scrutinized by both researchers to ensure the entirety of the interview was captured. Specifically, both researchers read through the notes and later discussed them together to assure all details from the interview were captured in their entirety and with the specific formulation. In case of ambiguity, the audio recordings were replayed. Additionally, by scrutinizing the notes, the researchers increased their closeness to the data, which enhanced their ability to make sense of it (Vaismoradi et al., 2016). This is of importance as the contribution to academia from qualitative research greatly depends on researchers' interpretation (Bell et al., 2019). As a next step, open coding was conducted, which is a process where data is broken down into codes before they are grouped into concepts relevant to the study's purpose (Bell et al., 2019). In detail, these concepts emerged from continuous reflection upon, comparison of, and analysis of codes which allowed them to be sorted and labeled into clusters of codes of similar meanings, known as concepts. Thereafter, a different level of coding was conducted with the aim to determine hierarchical connections and relationships between concepts to generate categories and sub-categories (Bell et al., 2019). Lastly, the codes that were in Swedish were translated into English. This was done after the coding process, so that the meaning of codes which are extracts of interviewees' formulations, would not be affected by a translation that could not be completely equated with the original.

To facilitate the coding process, NVivo was used. NVivo is a computer-assisted qualitative data analysis program especially useful when large datasets are being analyzed (Bell et al., 2019). NVivo allows for an easier process, as the software makes

it easier to systematically create and track codes which enhances the transparency of the process and consequently the research's quality (Welsh, 2002). Additionally, literature identified in the literature review was utilized to facilitate the process as it provided guidance to the researchers during the analyzing phase. For instance, by using the knowledge concerning the research domain, gained from the literature review, the researchers could more easily identify relevant concepts and categories.

For the analysis of the literature in the literature study, a similar approach was performed, where articles were coded in NVivo and later grouped into concepts relevant to the study. However, the coding did not have to be conducted on as many abstraction levels as the data gathered from interviews aimed to answer the second research question. Hence, a more facile coding process could be performed to generate theory to provide an answer to the first research question compared to the second one.

## 3.5 Research Quality

To assess the quality of research it is relevant to use different evaluation criteria depending on whether the study is of quantitative or qualitative nature (Bell et al., 2019). The reasons for this, the authors explain, lie in the different objectives and approaches of the strategies. To evaluate the quality of this thesis, the criterion of trustworthiness is applied. According to Bell et al. (2019), trustworthiness is a commonly adopted criterion within qualitative research than can be split into four criteria:

- *Credibility* – concerns whether the findings of the study are believable
- *Transferability* – concerns whether the findings can be applied in similar contexts
- *Dependability* – concerns whether the findings are persistent within the context
- *Confirmability* – concerns the degree to which the researchers' values have influenced the study

To strengthen the thesis's credibility, several actions have been taken. During the literature review, various databases were used to gather articles from numerous journals to increase the number of data sources, which according to Yilmaz (2013) enhances the credibility. Furthermore, the interviews conducted at the studied firm were performed with different roles and from different areas to allow various accounts of aspects – see Table 3.1 – something that can further enhance credibility (Bell et al., 2019). Moreover, as all but one of the interviewees provided consent to record the interviews, the researchers could ensure that the vast majority of all data was captured, thereby strengthening the study's credibility. Moreover, the credibility of the study was strengthened with the use of respondent validation, which means that participants confirm the accuracy of the findings by providing comments on selected parts of the thesis (Bell et al., 2019). For instance, all presented quotes and their use in section 4 have been validated by the respective interviewees. This was deemed especially important for quotes that were translated from Swedish.

Transferability is due to the uniqueness of qualitative case studies, agreed upon by multiple authors to invariably be a key issue (Bell et al., 2019). To strengthen this criterion, a thick description of the case was developed as recommended by Bell et al. (2019) and Yilmaz (2013). In addition, the literature review aimed to answer the first research question, is of a more general nature, which therefore enhances the transferability of this thesis.

Dependability is further described as a criterion that assesses the consistency of the process with regard to time and replicability by other researchers (Yilmaz, 2013). However, the emphasis on replicability is typically lower for qualitative than for quantitative research as it is regarded as unachievable due to the many procedures that can not be standardized (Jenner et al., 2004). To allow for replicability, the procedures applied have been documented. In addition, the case study's replicability can be strengthened by publishing the used interview guide (Bell et al., 2019) which is another measure taken in this study to enhance its quality – see Appendix A. Lastly, as NVivo increased the transparency of the analysis process, this also strengthened the replicability as per Bell et al. (2019).

Confirmability is always a concern in qualitative research since it is conducted on the basis of researchers' interpretations (Bell et al., 2019). Hence, it is impossible to guarantee that no personal values or inclinations are included (Bell et al., 2019). However, even if confirmability cannot be fully achieved, the level at which the internal interpretations can influence the research can be limited. To enhance confirmability, the emerging analyses and conclusions in the thesis were the result of both researchers. In addition, the thesis's results were continuously examined by supervisors from both the case firm and Chalmers. Although these measures cannot guarantee that no interpretations have influenced the outcome of the thesis, they are deemed to have mitigated the risks.

## 3.6 Ethical Considerations

Although achieving good research ethics can be bothersome, it is of essence to pay attention to the various ethical considerations that can arise when conducting research (Bell et al., 2019). To evaluate the research ethics in this thesis, the four ethical principles outlined by Bell et al. (2019) will be used.

- *Harm to participants* – concerns the avoidance of both physical and physiological harm
- *Informed consent* – concerns participants being well informed before making a decision
- *Invasion of privacy* – concerns regarding the privacy of participants
- *Deception* – concerns whether the intention of the study is portrayed differently from reality

These ethical considerations can arise in several stages throughout the process and need to be managed (Brinkmann & Kvale, 2018).

Harm to participants can arise as a result of having put a research participant in a situation that it regards as stressful or that has the potential of having negative effects on its profession or occupation (Bell et al., 2019). To mitigate the risk of participants being harmed, Brinkmann and Kvale (2018) suggest that the interview should be constructed so that the communication between researcher and interviewee does not create feelings of anxiety, unease, or hurt the interviewee's self-esteem. When developing the interview guide, these considerations were taken into consideration as a means of reducing the risk of psychological harm – see Appendix A. Participants were also informed of the possibility to at any time opt-out or decline to answer specific questions without reasoning, as recommended by Bell et al. (2019). Moreover, the interviews and the identities of the interviewees are kept confidential and anonymous. Furthermore, as a means to increase anonymity, generic names of roles were utilized – see Table 3.1. However, complete anonymity of the participants was deemed to not always be possible to achieve. Therefore, participants were informed of this before the interview was initiated.

The issue of informed consent involves providing interviewees with sufficient information about the study as a whole to facilitate a fair decision-making process for participants choosing whether to participate (Bell et al., 2019). To ensure informed consent was obtained, the invitation sent out to potential participants included a description of why the researchers requested to conduct interviews with the studied firm together with the thesis's purpose and aim. In addition, the participants that had accepted the invitation were informed again, prior to the initiation of the interview, and were given the opportunity to ask questions. In this way, the authors ensured that the participants were well informed as recommended by Bell et al. (2019).

Invasion of privacy of participants is closely linked to informed consent (Bell et al., 2019), which implies that this issue can be mitigated with similar procedures. In addition, the interview guide was developed so that questions, only relevant to the study, are included and thus no unnecessarily private questions are asked. Moreover, to further mitigate the issue, the researchers treated interviewees with respect and made sure not to interrupt or ask inappropriate follow-up questions.

The issue of deception relates to being dishonest about the research and what it entails (Bell et al., 2019). Furthermore, the authors describe that deception can arise when the study is misrepresented or when participants lack information or are misinformed. In this study, there is no indication of deception as all information conveyed about the study was truthful and aligned with reality. Moreover, as already declared, information about the study was provided repetitively to ensure participants were not misinformed or lacked information.

In addition to the presented ethical principles, other ethical and legal considerations were deemed necessary to take into consideration. One such consideration managed in this thesis is data protection and management which includes both legal and ethical aspects (Bell et al., 2019). The aspects of data protection were handled by

complying with GDPR in conjunction with adhering to policies provided by the studied firm. For instance, the recordings were stored safely and deleted after the completion of the study, which interviewees also were informed about. Lastly, ethical considerations can arise with the use of copyright materials (Bell et al., 2019). In this thesis, the issue of copyright has been managed by complying with Chalmers's policies.

### 3.7 Method Discussion

The research methods employed in this research were chosen to fulfill the thesis's purpose and aim by providing answers to the research questions. The methods were selected in the interest of available resources, specifically time and number of researchers, and by taking the scope of the thesis into consideration. Consequently, with more resources available for conducting the thesis, the methods chosen could have been adjusted accordingly. Firstly, a greater number of interviews could have been conducted if more time had been available for the study. Increasing the number of interviews could have given better coverage across the entire studied firm. Additionally, by having time for more interviews, the researchers could have interviewed a larger variety of roles. Lastly, if more time had been available, the length of the interviews could have been increased to enhance the details and concepts captured. Now, the interviews were limited to one hour due to the busy schedules of the interviewees. Therefore it was impractical for the researchers to pursue all leads in-depth, which impacted the possibility to gain more empirical data to support the answer to the second research question. Collectively, more resources available for the interview process could have increased the comprehensiveness of the study.

Furthermore, if it had not been for the remote set-up of the thesis, on-sight interviews could have been conducted. One of the downsides of not conducting face-to-face interviews is that it might impact the connection between the researchers and the interviewee, and the researchers therefore can miss potential data that can be obtained from the interviewee's body language and voice (Opdenakker, 2006). However, as video conferencing tools such as *Microsoft Teams* have become more common, it has lately not been regarded to be of great concern among qualitative researchers (Bell et al., 2019). As working from home, having *Microsoft Teams* as the major communication platform, has been the new normal for employees at the studied firm since two years back, the interviewees were considered to be comfortable using the tool, further lessening the concern.

In addition to face-to-face interviews, had the set-up not been remote and more time had been available, ethnographic observations could have been conducted. Observations could have been used to strengthen the answer to the second research question, concerning the identification of challenges that can arise when different methods coexist. Observations are advantageous since they, in addition to facilitating researchers' understanding of the contextual situation from the perspective of the interviewees, provide a more objective perspective by excluding the subjectivity from interviewees (Bell et al., 2019). Therefore, if more time had been given and

if the circumstances were not affected by COVID-19 making observations infeasible at the studied firm, it could have been used to triangulate the data gathered from interviews. Instead, interviews had to constitute the main data source for the second research question, where the researchers interviewed various employees from diverse roles and from different parts of the firm, to establish a substantial foundation for the study's analysis.

Lastly, the literature review provided a basis for understanding, facilitated the analysis of empirical data, and provided answers to the thesis's first research question. To discover when APM is more favorable to use, a narrative review was conducted. However, if more resources were provided, a systematic literature review could have been conducted instead. A systematic literature review enhances the quality of the literature study, as such a review is less likely to be affected by the researchers' prejudice since it follows well-defined steps with clear criteria (Tranfield et al., 2003). Despite this, such a review is generally very time-consuming and therefore was not considered appropriate due to the existing limitations of this study.



# 4

## Findings & Discussion

In this chapter, answers to the research questions are presented. In the first section, findings from the literature study are analyzed and discussed in order to provide an answer to the first research question, when it is favorable to use APM. In the second section, the findings identified in the case study are discussed and analyzed in relation to the literature, to provide an answer to the second research question, concerning what challenges can arise when APM and TPM coexist in an organization.

### 4.1 RQ1: Characteristics Determining when APM is Favorable

Within the literature, multiple authors testify of the importance of applying the right method when managing projects, as this otherwise can result in avoidable challenges and impact the project success negatively (Špundak, 2014). Moreover, the choice of an appropriate project management method should also facilitate an effective project and be tailored to its needs (Nouredine et al., 2009).

Nonetheless, identifying the most appropriate method can be challenging given the numerous project and environmental characteristics that influence the method selection (Bianchi, Conforto, Rebentisch, et al., 2021). Additionally, there is still confusion regarding which characteristics mostly influence the favorability of a project management approach. According to Gaborov et al. (2021), the selection must be based on the stakeholders' demands and inherent risks, size, complexity, and cost of a project. In contrast, Boehm and Turner (2003) claim that the most important characteristics are concerning culture, the project's size, criticality, and degree of dynamism, as well as the competence of the team and its size. Vinekar et al. (2006) acknowledge these characteristics and add the importance of the customers' culture. Špundak (2014) agrees with many of the authors and adds the importance of requirements' flexibility, stakeholder location, and customer availability while Fernandez and Fernandez (2008) adds that the quality of the project and the desired process transparency can also impact the selection. Thus, there exists no general agreement among authors on which factors for selecting the most favorable project management method should be used.

In this section, prevalent factors identified in the literature study that influence the favorability of APM, have been categorized into four types: *project*, *team*, *organi-*

*zational* and *external characteristics*. Lastly, a synthesis of the findings is provided in 4.1.5.

### 4.1.1 Project Characteristics

Project size is one of the most prominent characteristics that determine whether APM is suitable or not as it influences other characteristics such as team size, coordination, and communication (Kruchten, 2013), which in turn can influence overall project result (Alqudah & Razali, 2017). The importance of project size as a factor for APM is highlighted by other authors as well (e.g., Batra et al., 2010; Boehm & Turner, 2003; Vinekar et al., 2006). However, how the size of a project is defined is not clear. Some authors classify project size according to its duration, cost, and team size (Pérez-Ezcurdia & Marcelino-Sádeba, 2012) where Rowe (2020) states that a small project has a duration of fewer than six months, a team size of ten or fewer people, and a cost of less than \$75,000. Other authors claim that cost should be seen as a percentage of the organization's annual revenue, where a small project should have a budget of less than 5% of the annual turnover (Pérez-Ezcurdia & Marcelino-Sádeba, 2012). Whereas, some authors claim that project size can be judged by the required number of teams, where large projects require six teams compared to a small project where one team is sufficient (Imani et al., 2017).

Nonetheless, most authors state that APM is specifically intended for small projects (e.g., Batra et al., 2010; Bick et al., 2017; Špundak, 2014) while other authors state it can be used for small to medium-sized projects (Bianchi et al., 2020; Stoica et al., 2013). The division between these points of view can be due to the ambiguity concerning what a small project entails. Despite this, a smaller sized project is favored since APM is not as good as a traditional approach with monitoring costs which will increase with the project size (Batra et al., 2010; McCormick, 2012). Additionally, larger projects make it harder to judge the required effort and time for the project (McCormick, 2012) which makes authors question APM's efficacy for larger projects (Nerur et al., 2005).

Although many authors state that APM should be applied for small projects, APM has been successfully used for larger software projects (Batra, 2018). Additionally, Gaborov et al. (2021) state that Scrum and Kanban, two APM approaches, are convenient to apply to manage medium or large software projects with changing requirements. Nonetheless, Alqudah and Razali (2017) state that if APM should be utilized for large projects, a thoughtful selection of the specific APM approach is crucial. However, while there are authors who claim that the method can be used for large projects, particularly software projects, the general agreement within the literature is that APM is especially suitable for projects of smaller sizes.

Another characteristic that assists in the determination of whether APM is favorable is the way in which projects are being delivered (Conforto & Amaral, 2010). For APM to be favorable, projects should be able to be delivered incrementally (Owen et al., 2006; Tam et al., 2020; Zhong et al., 2011). The reason lies in the iterative

nature of the method, where work is partially delivered, reviewed, and altered in continuous cycles (Conforto & Amaral, 2010; Tam et al., 2020) which ultimately can accelerate the market launch according to Zhong et al. (2011). If a project cannot be delivered incrementally, for instance, due to technical restrictions or a higher cost of delivering partially, APM is shown to be less suitable (Thesing et al., 2021). Examples of such projects are within the construction industry, where an iterative approach would be too costly, if a cellar were to be added after the completion of the house or if the geographical location were to be changed (Thesing et al., 2021). For this reason, APM is often a favorable method within the software domain (Kaur, Jajoo, et al., 2015; Tam et al., 2020), where adjustment of code is not associated with equally large costs and efforts. This was further strengthened by several interviewees at the studied firm, who also claimed that this was the reason they viewed APM as more suitable for software projects rather than hardware projects.

Another project characteristic mentioned by several authors in regards to evaluating whether APM is favorable is project criticality (e.g., Boehm & Turner, 2003; Vinekar et al., 2006). This factor should not be mixed up with the importance of the projects for customers. For these types of projects, where the deliverables are highly important, APM is favorable (Bergmann & Karwowski, 2019; Nerur et al., 2005). Rather in this thesis, project criticality refers to whether people can get injured or hurt if the project turns out to be a failure. In those situations, where there is a large emphasis on safety, APM is not favorable (Chow & Cao, 2008; Tsoy & Staples, 2021). According to Kruchten (2013), these types of projects require massive amounts of documentation to assure a sufficient level of safety. As highlighted in the Agile Manifesto, the method values working products over comprehensive documentation (Beck et al., 2001). Moreover, Thesing et al. (2021) state that the operational risks of, for instance, safety-critical systems or real-time applications make such situations not favorable for APM, as these risks prevent the iterative nature. Nonetheless, some authors have an opposing view, believing that APM should be used for critical projects as the method facilitates the process to manage critical issues (Vinekar et al., 2006). However, the authors explain that in such situations, customers must be able to specify all safety requirements at the beginning which according to the opposing view is not always the case.

Another aspect that is often discussed as critical in determining whether APM should be used is the project's level of uncertainty. Within academia, most authors argue that APM is favorable to manage projects with a high level of uncertainty (e.g., Nicholls et al., 2015; Špundak, 2014; Thesing et al., 2021). By describing uncertainty in accordance with (Mikkelsen, 2016), who states that uncertainty can be seen as *knowns* which can be viewed as estimations with knowable risks, and *unknowns* which refers to unpredictability, APM is more favorable for projects both where estimations can be made and when there is no predictability. In detail, Nicholls et al. (2015) state that the method is preferred when it is unclear what tasks are needed, their required time, and which dependencies exist. Additionally, Nicholls et al. (2015) mention that APM is favorable when the availability of resources such as time and money is wavering. In close connection, Dybå et al. (2014) explain that

APM is of use for projects under time pressure when all details of execution can not be planned and when exploration and acquiring situational knowledge along the way is a necessity. Moreover, APM is to be used when the project's objective is poorly defined (Dubey et al., 2015; Gaborov et al., 2021; Nicholls et al., 2015) which rimes with having fewer planning activities from start and rather allowing a progressive way of working (Serrador & Pinto, 2015).

All in all, the implications of project uncertainty coincide with the iterative nature of APM, which enables the uncertainties to be mitigated and managed throughout the project. This contrasts with TPM where the design and plan are established early and thereafter followed (Serrador & Pinto, 2015; Thesing et al., 2021). Moreover, by adjourning decisions such as design features, APM is able to embrace initial uncertainties (Serrador & Pinto, 2015). Additionally, the method's short delivery cycles strengthen its capability to endure uncertainties, as it allows the method to quickly adjust to new changes (Sheffield & Lemétayer, 2013). Further, this aligns with the method's capability to handle uncertainties being its core strengths (Scholz et al., 2020). Moreover, Dybå et al. (2014) emphasize that an increase in project uncertainty implies a need to employ a more flexible project management method such as APM as a way of handling uncertainty. Lastly, while it is declared that APM is favorable for handling uncertainties, Špundak (2014) and Toljaga-Nikolic et al. (2017) highlight the importance of a clear business need, vision, and project goal. This was agreed upon by more than a handful of interviewees at the studied firm, stating that a holistic understanding of the goal or problem the developed solution intends to solve is necessary. Hence, although an image of the solution itself is lacking, the goal or the problem the solution is intended to solve should exist.

Closely connected to the level of project uncertainties is project dynamism, which refers to the rate of changes in a project (Butler et al., 2020). The close relationship between these factors is based on the fact that changes often induce uncertainties (Vinekar et al., 2006). However, a project could still comprise uncertainties even if the level of change is low. Additionally, what the change implies does not have to be uncertain, rather an idea of what the change's outcome will be can exist. Therefore, these characteristics should be seen as separate, although there is a close connection between them.

Within the literature, agreement among authors is that APM should be used for projects where the project dynamism and thus the level of changes in requirements are high (e.g., Batra et al., 2010; Boehm & Turner, 2003; Špundak, 2014) which aligns with the second of the twelve agile principles – see Table 2.2. Similar to handling uncertainties by dividing the work into iterations and continuously refining the project outcome, APM is able to manage changes in requirements (Gemino et al., 2021). In detail, Salameh (2014) explains that requirements are reconsidered and prioritized based on their respective value in each iteration, an analysis which is critical according to the authors. This means that requirements are fulfilled only when necessary, which allows APM to cope with unanticipated changes in project requirements in a flexible manner (Sheffield & Lemétayer, 2013). In agreement, Thesing

et al. (2021) emphasize the importance of the method's flexibility to changes rather than following a set plan since requirements and expectations tend to become more concrete throughout the project. Nonetheless, welcoming changes can be hard, and if misapplied it can result in adverse outcomes (Boehm & Turner, 2003). Hence, even if APM is favorable in an environment characterized by many and frequent changes, late changes can still misfortune the project, especially if they occur late in the project phase.

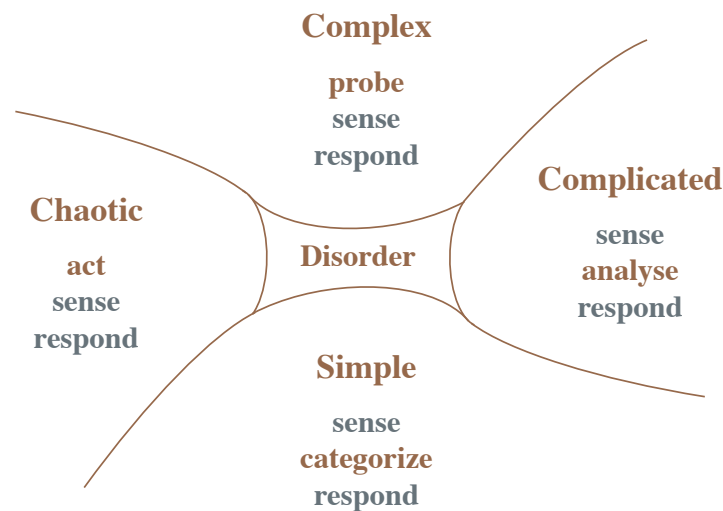
Project complexity is another characteristic widely discussed by several authors when the favorability of APM is debated (e.g., Bergmann & Karwowski, 2019; Dybå et al., 2014; Toljaga-Nikolic et al., 2017). Unlike most factors, authors within the project management domain have provided various definitions of project complexity (Mikkelsen, 2016). Butler et al. (2020) define the characteristic as the number of requirements and the degree of required technical know-how while Bergmann and Karwowski (2019) claim that project complexity is influenced by numerous factors such as team size, team distribution, and the number of sponsors dedicated to the project. Furthermore, some authors state that project complexity can be divided into five types: *structural*, *uncertainty*, *dynamic*, *pace*, and *socio-political* (Butler et al., 2020). Hence, according to these authors *uncertainty* and *dynamic*, where the latter type is referred to as dynamism in this thesis, are sub-dimensions of project complexity. The authors further view project complexity as a broader characteristic involving *structural complexity*, which can be seen as the number of system elements, and *pace complexity*, which refers to the criticality of time goals, and lastly *socio-political complexity*, which includes aspects such as conflicting interest and individuals' hidden agenda (Breitschuh et al., 2018). The implications of the different perspectives on project complexity can be a reason for the divided opinion between some authors, where some claim that APM is favorable for projects with high complexity while others claim the opposite.

For instance, Dybå et al. (2014) see APM as favorable to use when the level of complexity within the project is high, as high complexity cannot be planned for. Rather, the authors continue, the team needs to apply continuous learning throughout the project to manage projects with high complexity, which emphasizes the adoption of APM. In addition, Dybå et al. (2014) state that APM is favorable since it can manage the implications from a high complexity by its short iterations and heavily relying on the team's knowledge and ability to be creative rather than following set procedures. Worth mentioning, however, is that Dybå et al. (2014) discuss project criticality in connection with project uncertainty, which could imply that from the authors' point of view, these factors are in close relation to each other. Additionally, the authors describe project complexity from a software project perspective and state that the number of actions in the project and the interaction of the project's environmental factors determine the level of complexity.

On the contrary, Butler et al. (2020) state that APM is more favorable for projects with low complexity, and defines project complexity primarily as the number of project requirements. The reason for the authors' claim is that APM does not of-

fer the capability to manage, categorize and plan for requirements to be fulfilled systematically as TPM allows. Furthermore, O'Sheedy and Sankaran (2013) claim that APM is more favorable when a project involves a low level of complexity as complicated projects tend to be large and imply an increased emphasis on coordination activities. Moreover, the authors state that the higher the complexity of a project, the more severe are the implications of changes. Therefore, O'Sheedy and Sankaran (2013) advocate the utilization of TPM in those situations instead. Another perspective is provided by Vinekar et al. (2006), which agree that TPM is more favorable for large and complex projects as it can be more difficult to apply tacit knowledge in these situations, which is highly emphasized in the agile domain.

By defining project complexity based on the Cynefin Framework (Snowden & Boone, 2007) visualized in Figure 4.1, project complexity is seen as to what degree the project exists within the complex domain, as projects do not exist in one domain only throughout the process (Mikkelsen, 2016). The idea behind the Cynefin Framework is that a situation can be divided into five different domains and by identifying a situation's domain the most appropriate way of handling the situation can be chosen (Snowden & Boone, 2007). The five domains are *complex*, *complicated*, *chaotic*, *simple* and *disorder* – as visualized in Figure 4.1 – where the latter is applied when it is unclear to which domain the situation can be categorized to (Mikkelsen, 2016). Hence, most tend to focus on the first four domains (Breitschuh et al., 2018; Snowden & Boone, 2007).



**Figure 4.1:** Illustration of the Cynefin Framework developed by Snowden and Boone (2007)

In short, the *simple* domain is characterized by clearness, meaning that a situation is straightforward and thus an approach of *sense*, *categorize*, and *respond* is proposed as most appropriate (Breitschuh et al., 2018). Further, the *complicated* domain includes more unclearness but the future can still be anticipated, hence an approach of

*sense*, *analyze*, and *respond* is suggested (Mikkelsen, 2016). In contrast, a situation in the *chaotic* domain is unordered and cannot be predictable (Breitschuh et al., 2018). In such situations, practitioners are suggested to apply an approach of *act*, *sense*, and *response*, meaning they should try to sense where the situation is stable by first trying to establish some order (Snowden & Boone, 2007). This will allow practitioners to turn situations categorized in the *chaotic* domain to the *complex* domain (Snowden & Boone, 2007).

Similar to the *textit*chaotic domain, situations categorized in the *complex* domain are unordered and unstable with a high degree of dynamism, which makes the outcome of the project unpredictable (Breitschuh et al., 2018). Noteworthy, there is a connection between the characteristics of project dynamism and complexity, where the former influences the latter by being a subpart. Moreover, project complexity is seen as *unknown unknowns*, (Breitschuh et al., 2018) which implies a similar connection to project uncertainty. By utilizing the earlier provided description by Mikkelsen (2016) where uncertainty is divided into *knowns*, and *unknowns*, only the latter is part of complexity. Therefore, it is of value to separate these three factors, e.i., – complexity, dynamism & uncertainty – although there is a strong relation between them, where complexity can be seen as the overarching dimension.

Moreover, cause-and-effect relations can only be discovered in retrospect in the *textit*complex domain, and therefore practitioners should allow the path required to solve the situation to reveal itself, thus an approach of *probe*, *sense*, and *respond* is proposed to be most appropriate (Snowden & Boone, 2007). Therefore, by utilizing the definition based on the Cynefin, it can be stated that APM is more favorable for projects with high complexity, as the method's flexible nature allows potential solutions to emerge throughout the project rather than following a plan (Breitschuh et al., 2018; Mikkelsen, 2016).

To summarize, APM is favorable to use for small projects that inherit high levels of uncertainty, dynamism, and complexity. Moreover, for the method to be favorable the project should also be able to be delivered incrementally and have a low level of criticality. Noteworthy, all indications of these factors were described by various interviewees at the studied firm when discussing what project characteristics they viewed as important for APM to be favorable.

#### 4.1.2 Team Characteristics

Apart from specific characteristics of the project, there are also characteristics of the team which has been assigned to conduct the project that impacts the decision of whether APM is favorable to use. One of these characteristics often mentioned within literature is team size (Boehm & Turner, 2003). As mentioned before by Kruchten (2013), there exists a relationship between team size and project size, where the former often is determined by the latter. Hence if the project size is small, the agile team should be small as well. However, some authors believe that APM can be applied regardless of the size of the team (Nicholls et al., 2015). Still,

the authors continue, APM has proven to be more favorable when used by small teams as an increased number of team members often makes communicating harder. The view of APM being more favorable for small teams is agreed upon by several authors (e.g., Bianchi, Conforto, Rebentisch, et al., 2021; Hobbs & Petit, 2017; Tsoy & Staples, 2021). This contrasts with the appropriate size for teams in TPM, which can successfully be utilized for both small and large sizes, although Keshta and Morgan (2017) state it is preferred for larger teams. This is agreed upon by Boehm and Turner (2003) and Gaborov et al. (2021).

In a study by Scott (2010), the success rate of projects with different sized agile teams was investigated. The author discovered that the success rate was 83% for teams consisting of less than 11 team members while only being 55% for teams consisting of more than 25 people. Moreover, in a study by Chow and Cao (2008), the majority of the teams had less than 20 members and according to Kruchten (2013), a team should consist of less than 15 team members. In agreement with this, Hobbs and Petit (2017) highlight that most development projects are as small as having up to only nine team members but that some teams are greater in size ranging up to 15 members at the most. According to Lalsing et al. (2012), a team should preferably not consist of more than nine members that are able to communicate daily face-to-face.

In addition to making communication harder, having a larger agile team can also impair team performance (Lalsing et al., 2012). Moreover, Boehm and Turner (2003) state that teams with more than 40 members hinder knowledge sharing and tight coordination needed for APM. This is agreed upon by Lalsing et al. (2012), which underline the relationship between team size, and team member interaction and collaboration, which in turn affect team efficiency. In detail, the authors claim that too large teams lose efficiency due to communication and knowledge sharing issues. Thus, in larger teams, it becomes harder to maintain the productive communication that APM relies upon (Lalsing et al., 2012).

Nonetheless, there have been larger teams employing APM which have reported it as successful (Boehm & Turner, 2003). In detail, the authors describe how APM has been used on a team consisting of 250 members, although it is declared by the manager that he thought it was too big. Additionally, Vinekar et al. (2006) give examples of teams of 40 and other teams of more members which have proven successful. Some authors even argue that APM can be used for teams of sizes as large as up to 150 people (Lalsing et al., 2012). However, although APM can work for larger teams, the general agreement among authors is that the method is more favorable for smaller teams (Boehm & Turner, 2003; Dybå & Dingsøy, 2008; Lalsing et al., 2012).

Another characteristic of APM that has proven to be of importance is team competence and expertise (e.g., Chow & Cao, 2008; O'Sheedy & Sankaran, 2013; Špundak, 2014) which is one of the fundamentals for favorable usage of APM (Boehm & Turner, 2003). Furthermore, several authors highlight the need for a team with high levels and extent of talent for APM to be favorable (e.g., Boehm & Turner, 2003;



Chow & Cao, 2008; Tsoy & Staples, 2021). Team competency can be explained as having individuals with a breadth of knowledge within multiple disciplines, increasing the team's ability to perform various tasks (Bianchi, Conforto, Rebentisch, et al., 2021). High competence within the team is important, as this influences the team's agility and capability of handling a project (Boehm, 2002; Dybå et al., 2014; Tsoy & Staples, 2021) and increases the probability of it being successful (Tam et al., 2020). In contrast, TPM is not as dependent on team members' tacit knowledge (Singh & Kukreja, 2021) as projects for example often are planned upfront.

Additionally, a characteristic of agile teams often mentioned within the literature is team allocation, meaning to what extent team members are devoted to a specific project (Bianchi, Conforto, Rebentisch, et al., 2021; Tsoy & Staples, 2021). Most authors state that APM is favorable when team members are fully allocated to one project (Bianchi, Conforto, Rebentisch, et al., 2021; Böhmer, Lindemann, et al., 2018; Melo et al., 2011), especially if the project is characterized by a high degree of innovation (Conforto et al., 2014). Croitoru (2018) agrees with members being fully allocated, although the author says exceptions can exist for some members that might only be needed to participate in some sprints. By being full-time allocated to a project, members are able to concentrate more on their work without interruptions (Melo et al., 2011) which will increase the creativity and the interaction between members (Conforto et al., 2014). Moreover, allocation to multiple projects simultaneously has a negative impact on team performance (Melo et al., 2011) and teams' ability to self-organize (Hoda et al., 2011), which is another important team characteristic. In addition to having a high allocation of team members, Bunsiri and Kumprom (2016) emphasize the need for an even allocation which will facilitate the work for the team as they will know the cost for each sprint.

Teams being self-organized is another team characteristic of great importance for APM being favorable (Bianchi, Conforto, Rebentisch, et al., 2021; Chow & Cao, 2008; Tsoy & Staples, 2021), which is highlighted in the Agile Manifesto – see Table 2.2 – as these types of teams are declared to provide the best architectures, requirements, and designs (Beck et al., 2001). Self-organized teams are democratic in the sense that no official project leader is required, rather the team itself is responsible for decision-making and task prioritization (Sillitti et al., 2011). In comparison to APM, teams in more traditional settings often experience a more *command and control* type of leadership (Yang et al., 2009), where the Project Manager administers the project based on its requirements, hence there is less emphasis on team members to take a significant role and be committed (Fernandez & Fernandez, 2008). Nonetheless, agile teams generally have roles taking on leadership functions, such as Product Owners taking accountability for the project outcome and prioritizing requirements (Thamhain, 2014) while having the authority to make decisions regardless of other stakeholders involved (Gustavsson, 2017). Additionally, Agile Coaches often serve as facilitators for the adoption of agile by not only providing technical know-how but also exhibiting leadership skills (Stray et al., 2020). Lastly, agile teams use Scrum Masters, which facilitate the agile way of working by ensuring collaboration within the team while also managing the process by reporting and solving

issues, which are some of the responsibilities a project manager usually would have within TPM (Thamhain, 2014).

While being self-organizing and engaging in decision-making, a self-organized team has to carry the ability to anticipate and handle change requests along the course of a project (Bianchi, Conforto, Rebentisch, et al., 2021). Additionally, self-organized teams have been shown to affect other essential team characteristics such as team motivation (Melo et al., 2012) which is also one of the twelve principles outlined in the Agile Manifesto – see Table 2.2. The explanation, the authors continue, is that teams experiencing undermining of decisions due to unnecessary interferences often lose motivation and commitment to the project. Furthermore, the importance of a highly motivated team of employees has been highlighted in several studies (Melo et al., 2012; Paaïs & Pattiruhu, 2020; Peterson, 2007), and according to Salman et al. (2021) motivation is a key factor for an increased probability of project success, which emphasizes the importance of self-organized teams even more.

Another characteristic that can determine whether APM is favorable is team distribution (Kruchten, 2013). The agreement among authors is that APM is favorable when the agile team can be co-located, meaning that the entire team is physically located together (e.g., Bianchi, Conforto, Rebentisch, et al., 2021; Chow & Cao, 2008; Tsoy & Staples, 2021). By having co-located teams, in-person communication can be utilized for efficient communication (Cockburn & Highsmith, 2001; Drummond & Unson, 2008), which is one of the twelve principles of agile – see Table 2.2. Additionally, collocation of team members allows for closer and more frequent cooperation in teams which is fundamental for the usage of APM (Alyahya et al., 2011; Deshpande et al., 2016). As a consequence of fast and efficient communication, the team’s decision-making time can be shortened which facilitates its ability to be agile (Misra et al., 2009). In contrast, Keshta and Morgan (2017) state that the emphasis on team distribution is not as extensive for TPM, and team members can therefore be distributed or co-located. A potential reason can be that the communication in TPM is more formal compared to informal as for APM (Nerur et al., 2005; Zavyalova et al., 2020).

Although multiple authors state that teams should be co-located for APM to be favorable, organizational factors such as company size and structure, and other circumstances such as team members being of different geographical locations, distributed agile teams are becoming more common (Drummond & Unson, 2008; Korkala & Abrahamsson, 2007). For instance, during the interviews at the studied firm, it became evident that most teams were not co-located since many team members still worked from home due to COVID-19. Additionally, the firm’s global presence makes it more challenging for teams to be co-located, since teams often consist of members located in various countries. Although being distributed was not described as a challenge by the interviewees, it is stated in the literature that distributed teams generally face communication and collaboration challenges (Deshpande et al., 2016; Herbsleb, 2007). The reasoning is that even though tools and techniques exist to mitigate these challenges, natural contact points between team members such as con-

versations by the coffee machine cannot be replaced (Drummond & Unson, 2008). Hence, despite the advancement of different tools aimed to facilitate communication and collaboration, APM is declared to be more favorable when teams are co-located.

To summarize, APM is favorable when a team is small, co-located, and fully allocated to a project. Moreover, team members should be self-organized, highly motivated, and have a high level of experience and expertise. Notably, all these team characteristics were discussed as important by various interviewees at the studied firm, except team distribution which was not as accentuated, presumably due to the firm's global presence and COVID-19.

### 4.1.3 Organizational Characteristics

Although the characteristics of the project and the selected team can provide an indication for when APM is favorable to use, multiple authors highlight the significance of taking organizational characteristics into consideration, as these characteristics have the potential to influence the outcome of the chosen method greatly (Bianchi, Conforto, & Amaral, 2021). This is especially relevant for agile methods, as these challenge the traditional ideas and organizational structures often used by organizations (Hoda et al., 2011). When discussing organizational characteristics which affect the method, the following characteristics are frequently mentioned: level of management support, management style, and the organizational structure, culture, and environment (Mishra et al., 2021; Sidky et al., 2007; Tsoy & Staples, 2021). Other characteristics which also can affect whether APM is favorable are level of training and learning, and practices and tools (Hoda et al., 2011; Mishra et al., 2021; Tam et al., 2020). Nonetheless, multiple of these factors are connected to each other while others are overlapping. For instance, Soundararajan and Arthur (2011) state that an organization's culture influences the adopted practices and Tolfo et al. (2011) utilize a model to describe the organizational structure as a sub-factor to organizational culture; hence, a factor that other authors account for separately.

A reason for the various interpretations of organizational culture is that the term can be construed to include practically all dimensions in an organization, like assumptions and beliefs, norms, behaviors, practices, languages, knowledge, and technology (Iivari & Iivari, 2011). Furthermore, some authors state that a part of organizational culture is not visual, but rather can be viewed as the underlying feelings and perceptions hidden within an organization and among the employees, while the visual part concerns aspects such as structure, role names, goals, and practices (Tolfo et al., 2011). Although these aspects contribute to the shape of organizational culture, a distinction is made within this thesis. Instead of including organizational structure in culture as multiple authors do (Robinson & Sharp, 2005; Tolfo et al., 2011), the characteristic will be reviewed as separate, while organizational culture will be explained as the shared beliefs impregnated within the organization that influence teams' and employees' actions as per Strode et al. (2009)'s definition.

Within the literature, multiple authors highlight the necessity for a suitable culture

for APM to be favorable (Conforto et al., 2014; Dorairaj et al., 2013; Mishra et al., 2021; Zavyalova et al., 2020). As stated by Lindvall et al. (2002, p. 203) *“If the culture is not right, then the organization cannot be agile”*. Thus, a suitable organizational culture is a critical characteristic for APM, especially as the method emphasizes individuals, interactions, and customer collaboration as per the Agile Manifesto (Misra et al., 2009). Moreover, factors that promote a suitable culture for APM can be derived from the twelve principles of agile – see Table 2.2 – like the provided amount of support and trust to the team (Tolfo et al., 2011). That a culture should value support and trust is essential according to several authors (e.g., Lindvall et al., 2002; Misra et al., 2009; Špundak, 2014). If employees are trusted and empowered, this lays the ground for teams being self-organized (Hoda et al., 2011), which already is declared as an important team characteristic. Moreover, this will create a favorable environment for APM, where employees feel comfortable raising issues, asking for support, and making decisions together (Hoda et al., 2011). As a consequence, this implies that an organization must be comfortable living with a team’s decision and not have second thoughts on the decisions taken (Lindvall et al., 2002). This can be challenging as traditional organizations tend to favor standard working procedures and established processes where decisions are taken by management without involving subordinate employees (Poth et al., 2019).

Furthermore, an organization’s culture also needs to value collaboration (e.g., Aldahmash et al., 2017; Hoda et al., 2011; Strode et al., 2009) which can be challenging, as employees unintentionally take ownership of their part of a project (Tolfo et al., 2011). Further, this can create a culture where employees blame each other rather than take responsibility as a team, which counteracts the idea of agile teams (Tolfo et al., 2011). Thus, collaboration is an essential part of the organizational culture for APM to be favorable.

An additional dimension to organizational culture is the acceptance of the agile method, which needs to be instilled in the entire organization and its culture (Chow & Cao, 2008; Conforto et al., 2014; Tsoy & Staples, 2021), especially if APM is to be implemented in an organization using traditional approaches (Gupta et al., 2019). This was also underlined by a handful of interviewees, who described the importance of acceptance and understanding of the method within the studied firm for teams to apply it successfully. Moreover, feedback and learning are essential for APM to be favorable and must therefore be valued by the organizational culture (Hoda et al., 2011; Misra et al., 2009; Strode et al., 2009). Lastly, although an appropriate culture for APM is important to establish, it is equally important to promote and maintain it (Tolfo et al., 2011).

Another important characteristic mentioned by several authors is the level of management support, where the agreement is that there should be strong support from management for APM to be favorable (e.g., Bianchi, Conforto, Rebentisch, et al., 2021; Cockburn & Highsmith, 2001; Conforto et al., 2014). Multiple authors even state that lack of management support is a failure factor for APM (Chow & Cao, 2008; Mishra et al., 2021). One reason is that management is able to highly influ-

ence the promotion of an organizational culture appropriate for APM (Sidky et al., 2007), by for instance creating acceptance and recognition among the employees of the method (Noteboom et al., 2021), and by promoting collaboration, trust, and empowerment which will allow for self-organized teams (Dorairaj et al., 2013; Hoda et al., 2011). Moreover, supportive management can advocate for fully allocated teams which further favors APM, as they have the mandate to influence the resource allocation within an organization (Dorairaj et al., 2013; Hoda et al., 2011). Additionally, managers can assure teams consist of the right team members with the appropriate attributes for the promotion of APM, and that the organization hires or provides training to such individuals to ensure teams consist of members with high and extensive knowledge, which favors APM (Dorairaj et al., 2013).

Nevertheless, achieving high management support for agile methods can be challenging, as managers often focus on risk and opportunity in projects (Dorairaj et al., 2013), where they are reluctant to the former (Mishra et al., 2021). Therefore, managers tend to require a detailed plan with milestones, in order to support the team performing the project (Dorairaj et al., 2013), which prohibits the flexible nature of APM. Moreover, managers tend to identify employees based on their specific roles which can hinder the agile way of working in teams, as team members should be able to perform multiple tasks (Boehm & Turner, 2005). It has further been concluded that TPM, in contrast to APM, does not require the same type of management support in the sense that it rather has extensive planning and risk-aversion as a basis for project management (Ahimbisibwe et al., 2015).

A facilitator for the desired management support and thus closely connected is the adopted management style. For APM to be favorable, management needs to adopt a style that values *leadership and collaboration* (Nerur et al., 2005; Sidky et al., 2007; Strode et al., 2009) rather than the traditional style of *command and control* (Dybå & Dingsøyr, 2008; Kuusinen et al., 2016; Misra et al., 2010). In detail, this means that management should become leaders that are role models for the employees and inspire them to be creative and committed to the team (Yang et al., 2009). Furthermore, this management style implies that management should not micromanage employees' work but rather provides the appropriate support (Misra et al., 2010), which has already been declared as an important characteristic.

Another characteristic viewed as important when the auspiciousness of APM should be determined is organizational structure (Conforto et al., 2014). Within the literature, multiple authors advocate an organizational structure that is non-hierarchical or non-bureaucratic (Dybå et al., 2014; Hoda et al., 2011; Mishra et al., 2021) which is the opposite to what favors TPM (Zavyalova et al., 2020)– see Table 2.1. The reasoning is that such a structure often hinders the empowerment of teams (Mishra et al., 2021) and their ability to be self-organized (Hoda et al., 2011), characteristics of high importance for APM. Additionally, hierarchical organizational structures often utilize heavy-weight processes that rely on substantial documentation, which negate APM's light-weight practices (Hoda et al., 2011). Moreover, a hierarchical structure can hinder the iterative nature of APM (Thesing et al., 2021) and the flow of in-

formation and feedback, and thus a culture that values openness (Hoda et al., 2011).

Rather, for APM to be favorable, an organizational structure should be informal and organic to encourage cooperation (Chow & Cao, 2008; Tam et al., 2020; Zavyalova et al., 2020). An informal structure is also more likely to accept agile methods according to Strode et al. (2009). Additionally, such a structure will enable the organization to promote decentralized decision-making, an important enabler for APM (Conforto et al., 2014) as well as rapid communication between team members and customers (Alqudah & Razali, 2017; Misra et al., 2009) as there will be no hierarchical boundaries (Hoda et al., 2011). Lastly, such a structure will align with the desired culture for APM which is important, as a misalignment between structure and culture may be troublesome (Dybå et al., 2014).

To summarize, APM is favorable in an informal and organic organization that values collaboration, feedback, and learning. Moreover, the organization should accept the method and empower, support, and trust teams. Lastly, the role of management is highly emphasized since they have the opportunity to greatly influence the organizational culture. Therefore, APM is favorable when management supports APM and employs a style that values leadership and collaboration. This was also the organizational characteristic most accentuated during the interviews where a handful of interviewees described that if management were not supportive of the method, it could hinder the utilization of APM. Altogether, all indications of these factors were discussed by various interviewees when they were asked what organizational characteristics they viewed as important for APM to be favorable.

### 4.1.4 External Characteristics

Besides characteristics inherent within the organization, the team, and the project, there occur characteristics outside of the organization which can affect the favorableness of APM (Boehm & Turner, 2005). Such characteristics can for instance concern the environment of the organization such as its geographical location and the industry, and macroeconomic factors such as inflation and political decisions. However, since such characteristics affect the organization, the project, and the team (e.g., Gaile, 2013; McNeal, 2009), these characteristics are deemed to already be represented in the preceding sections. For instance, Gaile (2013) states that macroeconomic, social, and legal factors, often due to the geographical location of an organization, highly influence the organizational culture. Moreover, the industry highly affects the characteristics of a project, for example, software projects are to a greater extent able to be delivered incrementally compared to projects in the construction industry (Thesing et al., 2021). Therefore, in this thesis, external characteristics will concern external stakeholders such as customers and suppliers, as these are deemed not to be represented in other characteristics.

Starting with customers, multiple authors emphasize the importance of their role in APM to provide input and feedback to the development process (e.g., Boehm & Turner, 2005; Chow & Cao, 2008; Conforto et al., 2014). Customer collaboration is

also highlighted in the Agile Manifesto as one of the four values (Beck et al., 2001). Therefore, APM is seen as favorable when the degree of customer collaboration is high (e.g., Alqudah & Razali, 2017; Misra et al., 2009; Tsoy & Staples, 2021). If customers are not committed to the project, or if the commitment is low, the project faces increased risks which ultimately results in a declining probability of conducting a successful project (Boehm, 2002; Tam et al., 2020). Noteworthy, customers are important in the adoption of TPM as well (Nerur et al., 2005). However, the interaction is more according to the need and focused on the contract (Boehm & Turner, 2003) while the interaction with customers is more critical for APM (Nerur et al., 2005). Thus, APM is more heavily reliant on customers providing value and direction to the project throughout the process, especially when the project is experiencing a high level of dynamism (Batra, 2018).

In addition to a high degree of collaboration and closely connected is the frequency of customer involvement which is viewed as a prevalent characteristic to determine whether APM is favorable (Alqudah & Razali, 2017; Conforto et al., 2014; Lindvall et al., 2002). Similarly, this is emphasized as one of the principles of agile – see 2.2 – thus, there should be an interaction with customers early and continuous throughout the project (Alqudah & Razali, 2017). This contrasts with TPM, where customers only are involved in the initial phase where the requirements are set (Tam et al., 2020). Furthermore, early and continuous involvement is further supported by the iterative nature of the method, where feedback is provided in frequent interactions and adjustments are made accordingly (Serrador & Pinto, 2015). Moreover, by including customers often in the process, the organization can decrease the time and cost of the project by avoiding the excessive cost of unwanted features, limiting errors, and creating a solution that more accurately matches the customers' needs (Conforto et al., 2014). However, for customers to participate frequently and continuously throughout the process can be challenging (Alqudah & Razali, 2017). Potential reasons are that some customers can be hard to involve due to their busy schedules and unavailability (Conforto et al., 2014; Pierce, 2008) or that they are spread around the world (Näkki et al., 2011). Therefore, Pierce (2008) states that it is important to ask busy customers what type of input the team requires and when in advance.

Another characteristic concerning the customers is their level of knowledge and empowerment. In detail, as many as 58% of the investigated companies answered in a survey conducted by Conforto et al. (2014), that they had involved the customers in the project planning but had not received any particular influence. An explanation, according to the authors, is that the assigned customers do not have the right authority to provide valuable input. Hence, despite being frequently involved, customers must be empowered and also withhold the appropriate knowledge (Boehm, 2002; Cao et al., 2009; Highsmith & Cockburn, 2001). Otherwise, the project will be exposed to increased risks, as customer feedback might provide incorrect desired functionality (Alqudah & Razali, 2017) or lead the project in the wrong direction (Highsmith & Cockburn, 2001). Thus, as declared by Highsmith and Cockburn (2001, p. 122) *“poor customers result in poor systems”*.

A reason why having customers on-site is promoted is that it enables team members and customers to build closer relationships (Wu et al., 2008) which in turn can replace detailed requirements specification (Cao et al., 2009). However, customers are not always able to be on-site due to numerous reasons and according to McMahon (2005), this should not be a reason to not have frequent interactions or form close relationships.

Lastly, customers need to allow flexibility in their contracts for APM to be favorable as a method for the project (Hoda et al., 2011) which can be hard as customers might be used to declaring their requirements upfront as per the traditional approach (Tam et al., 2020). However, if customers are not flexible, this may constrain the work of the agile team if, for instance, the cost and time of the project are fixed (Hoda et al., 2011). However, this can be challenging as customers often are used to having fixed contracts (Hoda et al., 2009). Nonetheless, instead of determining the cost, time, and scope up-front, it has been suggested that customers should be provided with the opportunity to opt-out if they are not satisfied with the project's outcome (Hoda et al., 2011). Other proposals include building an initial small system for trial and allowing customers to change the prioritization of items or swap items (Hoda et al., 2009).

Although not discussed to the same extent as customer characteristics, the degree of supplier involvement is still viewed as an enabler for APM to be favorable (Conforto et al., 2014). By collaborating with the suppliers, the organization can avoid delays and reduce cycle time (Conforto et al., 2014). Furthermore, by involving suppliers in the design phase, the speed of the process can be increased and less improved performance can be achieved (Kumar et al., 2020). Consequently, having a high degree of collaboration with suppliers can subsequently increase the satisfaction of customers (Power et al., 2001). Noteworthy, it is presumed that a good relationship with suppliers along with other stakeholders is beneficial regardless of the method applied (Thamhain, 2014). However for APM, it is especially important to have involved and flexible suppliers, as in contrast to TPM, projects generally include more uncertainties and changes which must be dealt with efficiently (Thamhain, 2014).

To summarize, APM is favorable when customers are willing to collaborate early, frequently, and to a great extent. Moreover, customers should be flexible, knowledgeable, empowered, and co-located with the agile team. Lastly, it is also important to have a high collaboration with suppliers for APM to be favorable. Noteworthy, all indications of the described factors were emphasized during the interviews, except high supplier collaboration. A potential reason can be that some projects at the studied firm might not be so heavily reliant on suppliers, while another reason might be that Ericsson already has established well-functioning relationships with suppliers, making it not a critical determinant for whether APM should be used or not.

Additionally, a handful of interviewees described the importance of customers under-



standing the agile way of working as if customers lacked understanding they could potentially hinder the agile way of working. For instance, interviewees described that if customers did not understand that projects are delivered incrementally, but instead expect a fully delivered product TPM could potentially be more preferable. A potential reason why this is not as discussed in the literature might be that this is viewed as a necessity to achieve high collaboration and flexibility from customers needed for APM. Hence, if customers lack understanding, customer collaboration and flexibility will likely be low which implies that APM is not favorable.

#### 4.1.5 Synthesis of Factors for Agile Favorability

From the literature review, 21 prevalent factors that influence the determination of whether APM is favorable to utilize in a specific context have been identified. Further, these factors have been divided into four types: *project*, *team*, *organizational* and *external characteristics*. Project characteristics refer to factors solely concerning the project in question, while team characteristics refer to factors inherent in the team selected to carry out the project. Organizational characteristics refer to factors of the organization liable for the project which can impact the selected method's outcome. External characteristics refer to factors that lie outside of the organization's boundaries but can still impact the choice. A summarization of these characteristics and the factors' respective indications of when APM is favorable is visualized in Table 4.1.

**Table 4.1:** Factors for when agile project management is favorable from the literature

Type	Factor	Indication *	References
<b>Project characteristics</b>	Project size	Small	(e.g., Bick et al., 2017; McCormick, 2012; Špundak, 2014)
	Project deliverability	Incrementally	(e.g., Owen et al., 2006; Tam et al., 2020; Zhong et al., 2011)
	Project uncertainty	High	(e.g., Owen et al., 2006; Tam et al., 2020; Zhong et al., 2011)
	Project criticality	Low	(Chow & Cao, 2008; Tsoy & Staples, 2021)
	Project dynamism	High	(e.g., Batra et al., 2010; Boehm & Turner, 2003; Špundak, 2014)
	Project complexity	High	(Breitschuh et al., 2018; Mikkelsen, 2016)
<b>Team characteristics</b>	Team size	Small	(e.g., Bianchi, Conforto, Rebentisch, et al., 2021; Hobbs & Petit, 2017; Tsoy & Staples, 2021)
Table Continues on Next Page			

Continuation of Table 4.1			
Type	Factor	Indication*	References
	Team experience & expertise	High	(e.g., Boehm & Turner, 2003; Chow & Cao, 2008; Tsoy & Staples, 2021)
	Team allocation	Fully-allocated	(e.g., Bianchi, Conforto, Rebentisch, et al., 2021; Böhmer, Lindemann, et al., 2018; Conforto et al., 2014)
	Team attributes	Self-organized & highly motivated	(e.g., Bianchi, Conforto, Rebentisch, et al., 2021; Chow & Cao, 2008; Tsoy & Staples, 2021)
	Team distribution	Co-located	(e.g., Bianchi, Conforto, Rebentisch, et al., 2021; Chow & Cao, 2008; Tsoy & Staples, 2021)
<b>Organizational characteristics</b>	Organizational culture	Collaborative	(e.g., Aldahmash et al., 2017; Hoda et al., 2011; Strode et al., 2009)
		Employees are supported, empowered & trusted	(e.g., Lindvall et al., 2002; Misra et al., 2009; Špundak, 2014)
		Method should be accepted	(e.g., Chow & Cao, 2008; Conforto et al., 2014; Gupta et al., 2019)
		Feedback & learning is promoted	(Hoda et al., 2011; Misra et al., 2009; Strode et al., 2009)
	Management support	High	(e.g., Bianchi, Conforto, Rebentisch, et al., 2021; Cockburn & Highsmith, 2001; Conforto et al., 2014)
	Management style	Leadership & collaboration	(Nerur et al., 2005; Sidky et al., 2007; Strode et al., 2009)
	Organizational structure	Informal & organic	(e.g., Chow & Cao, 2008; Strode et al., 2009; Zavyalova et al., 2020)
Table Continues on Next Page			

Continuation of Table 4.1

Type	Factor	Indication*	References
<b>External characteristics</b>	Customer collaboration	High	(e.g., Bianchi, Conforto, Rebentisch, et al., 2021; Boehm & Turner, 2003; Conforto et al., 2014)
	Frequency of customer interaction	Early & continuous	(e.g., Alqudah & Razali, 2017; Conforto et al., 2014; Serrador & Pinto, 2015)
	Customer empowerment & knowledge	High	(e.g., Boehm, 2002; Cao et al., 2009; Highsmith & Cockburn, 2001)
	Customer distribution	Co-located	(Boehm & Turner, 2003, 2005; Lindvall et al., 2002)
	Customers' flexibility	High	(e.g., Hoda et al., 2009, 2011)
	Supplier collaboration	High	(e.g., Conforto et al., 2014; Kumar et al., 2020; Power et al., 2001)
*Refers to the indication of respective factor which determine when APM is favored			

## 4.2 RQ2: Challenges due to Coexistence of APM & TPM

In this section, challenges identified through interviews conducted at the studied firm are analyzed and discussed. Altogether, five challenges associated with the coexistence of different methods were identified. These challenges are given an ID as is presented in Table 4.2 with the number of interviewees who disclosed the challenge. Accordingly, in the following subsections the identified challenges are analyzed and discussed disjointly. Lastly, a synthesis is provided of all challenges identified.

Noteworthy is that the challenges identified at the studied firm, although divided into different IDs, cannot be fully separated into mutually exclusive categories. The reason why is that the IDs all are interconnected, in the sense that they interplay and amplify each other. An example of such an interconnection is the one between *Lack of Understanding of other Methods* and *Methodological Differences*, where the former is influenced by the latter, but not the ultimate cause of it. Moreover, a similar connection can be drawn to *Synchronization Issues & Lack of Adjustments* and *Ambiguity in Individuals' Roles & Responsibilities*, since these challenges are influenced by both lack of understanding and methodological differences but also are influenced by other factors such as resistance to change. Thus, these challenges are all intertwined, meaning that if one is influenced it is likely that the others are too.

**Table 4.2:** Relevant challenges identified during interviews at studied firm

Challenge Title	ID	Interviewees
Lack of Understanding of other Methods	ID1	18
Methodological Differences	ID2	15
Mismatch in Organizational Characteristics	ID3	12
Synchronization Issues & Lack of Adjustment	ID4	17
Ambiguity in Individuals' Roles & Responsibilities	ID5	14

#### 4.2.1 ID1: Lack of Understanding of Other Methods

The first challenge identified from the interviews concerned how employees' did not fully understand what all methods within the firm imply. Often employees were only exposed to one method - i.e. either APM or TPM, which caused a lack of understanding for teams using another method to manage projects. Moreover, lack of understanding induced misconceptions of the method and how teams work. Consequently, this challenge was found to provoke inter-team collaboration issues.

In detail, interviewees described that as multiple project management methods are used within the studied firm, it can make it more difficult for employees to create an understanding of all different methods which can cause conflicts. For instance, one interviewee described how before, when the firm only had one method to manage their projects, it was easier to understand how a project is conducted since the method was deeply rooted in the firm and its employees. Another interviewee described that it was easier to relate to what other teams were doing before the firm implemented more methods since everyone previously used the same method. This aligns with the findings in the literature that lack of understanding can be hard to mitigate as it might require additional efforts from employees to establish an understanding (Bjarnason et al., 2022; Bjørnson et al., 2018). If left unaddressed, this might hinder effective inter-team collaboration.

“Back then it was a lot more clear as there were three different types of PROPS [a traditional method developed by Ericsson] to choose from and people knew the method by heart. Back then, the greatest challenge was which type to choose. Nowadays, with agile, there is a greater range of methods to choose from which makes it harder to understand them fully.”

– Manager

Moreover, a handful of interviewees described that although the firm provided training in the new method, it was not the same as using the method and applying the knowledge. For instance, one interviewee highlighted the difference between understanding agile's logic on a theoretical level compared to putting the knowledge

into practice, which gives rise to challenges. Another interviewee described that for teams that have not been exposed to agile in practice, it will be hard for them to understand the way of working as it will be foreign for them. Hence, the interviewees described a lack of practical knowledge as a hindrance to effective inter-team collaboration. This aligns with the literature which addresses that knowledge and understanding of other teams' capacity and knowledge are of importance for efficient inter-team collaboration and coordination (Bjørnson et al., 2018; Espinosa et al., 2007). One reason is that dissimilarities in knowledge can create a sense of distance and unfamiliarity with other teams, giving rise to cognitive distances and faulty assumptions of one another, which ultimately impair the inter-team collaboration as well as the project outcome (Badampudi et al., 2013; Bjarnason et al., 2022; Bjørnson et al., 2018). Thus, when this knowledge for various reasons is lacking, it affects inter-team collaboration negatively which is evident in both the conducted interviews and literature.

“As a traditional team if you have never been exposed to agile it will be very difficult for you to understand how the agile team is working. So the traditional team is more like, why can't you plan this way that we need you to.” – Agile Coach

As previously declared by Bjarnason et al. (2022), lack of understanding can cause teams to make assumptions about each other and form a basis for misconception. Throughout the interviews, it was apparent that such misconceptions existed in the studied firm and that they can give rise to friction and conflicts between teams. For instance, a handful of interviewees claimed that a common misconception is that APM incorporates very little to no planning. Moreover, one interviewee mentioned that agile is often thought of as an antonym to planning, which is not the case, while another interviewee explains that this misconception in turn is interpreted as if the agile teams cannot give any promises and that everything is done randomly by chance. That this is not entirely true is confirmed by both literature and the conducted interviews, which state that APM incorporates planning, however in contrast to TPM the plan in APM is not steadfast but can change when new input is gained. Additionally, interviewees described how misconceptions can give rise to unrealistic and diverging expectations. In detail, two of these conveyed that when you do not have an understanding of another team's work, it can cause misalignments in what you expect of them. For instance, one team can expect delivery of an exhaustive product from an agile team but instead receive an incomplete product on which they are to provide feedback. Such an issue, the interviewee describes, is not as common when teams apply the same methods, since both teams would understand the method's way of working. This further emphasizes the increased likelihood of the challenge when different project management methods are used, and how this can give rise to misconceptions, conflicts, and frictions between teams, and thus impair their collaboration.

“I think that it [misperception that agile doesn’t plan] can affect the collaboration and increase conflict or friction between different teams.”  
– Manager

To conclude, when employees lack understanding of methods other teams apply, it is not bewildering that it can create issues such as misperception and misunderstandings when these teams are collaborating. However, the literature has shown that such issues can emerge between teams regardless of whether different methods are applied. Therefore, this challenge can be declared to parallel the challenge of *Lack of Understanding* presented in Table 2.3. This further aligns with declarations from interviews, where some stated that misconception and misunderstanding can occur between teams applying similar methods as well, although the issue often is more burdensome and evident when different methods are applied. Consequently, it can be stated that in a firm where different methods coexist, the general challenge of lack of understanding is enhanced and thus more likely to pose an obstacle.

### 4.2.2 ID2: Methodological Differences

The second challenge identified from the interviews concerns the differences between the methods – APM & TPM – and how these can create a basis for conflicts when these teams need to communicate and collaborate.

A methodological difference highlighted by multiple interviewees concerns the terminology inherent in the two methods. For instance, one interviewee said that they have experienced team members not knowing the exact meaning of the word *retrospective* which is used in APM to refer to the recurring meeting held at the end of a sprint. As a consequence, multiple interviewees described that this can result in misunderstandings between teams, as teams might interpret a certain word differently. Additionally, the literature highlights that differences in terminology can lead to teams speaking different languages, which is declared to complicate communication between teams (Noll et al., 2010). Such a situation is described by one of the interviewees:

“If you are going to work with a team that has always worked with a traditional approach, first of all, you will need to tell them some of the terminologies that you are using, for instance, what ceremonies are, otherwise they might not understand what this means. Then there is a language gap” – Manager

Another methodological difference giving rise to challenges is the different levels of flexibility inherent in the two methods. For instance, in TPM the requirements are generally set in the beginning while APM is highly flexible to embrace change. Moreover, in TPM an initial plan is set to be followed without interpretations, while APM continuously iterates the plan. These differences in flexibility pose a challenge according to multiple interviewees when an agile team needs to collaborate with a team applying a traditional approach. For example, one interviewee described how

their team was hindered to be fully agile as the traditional team had established a plan in which they had promised the customer a specific product on a specific day. In detail, the interviewee's team could not incorporate all feedback and make any potential changes that would in their meaning provide a more value-added solution to the customer as per the agile way, as this would imply that the deadline would not be met. Whether this particular conflict arose due to the customer's lack of flexibility – an important factor for whether APM is favorable or not – or if the traditional team chose to declare all requirements up-front as per the traditional method, was not declared. Regardless, the question of flexibility poses a challenge in both matters when methods with different approaches to it are set to collaborate as one wants to freeze the requirements and plan, while the other wants to embrace potential change, emphasized by an interviewee below.

“For instance if you are developing one product, and a sub-product is developed by another team and these teams are working with different methodologies, then there definitely could be certain challenges. Because for the team working waterfall on the sub-product, their requirements would be frozen in the beginning until they deliver after six months. While the other team is using agile, they are continuously developing, testing the product with the user, and receiving feedback that might imply changes that might lead to the sub-products that could end up being something different. Such a situation could result in challenges in terms of integrations and concerning what you are trying to build” – Manager

While multiple interviewees spoke of the barriers to being fully agile due to collaboration with traditional teams that lack flexibility, other interviewees argued for the importance of providing a more fixed plan, something which in contrast is hindered by teams aspiring to be fully agile. Furthermore, the issue of flexibility in planning has been testified as especially challenging in the studied firm by multiple interviewees. One of these interviewees states that teams must be able to provide a plan in firms highly driven by dates such as the studied firm, while another interviewee described that by providing a plan, management can more easily relate to the project as they will know what the team is doing and when they will receive an outcome. This aligns with the challenge highlighted by Dorairaj et al. (2013), to why receiving the necessary management support can be hard in a traditional firm, which is due to their main focus being on the project's opportunities and risks. However, another interviewee described how this issue has been improved by shortening the planning horizon from multi-year to quarterly. Although it still inhibits the flexibility in APM, it is an adjustment deemed necessary to balance the aspects of both methods and make the collaboration more efficient.

“The conflict arises when management desires control and agile teams cannot provide a detailed plan of where they are in 2-3 years. The agile teams will tell them that they are where they need to be although they do not know exactly, as this is something they will discover during the process. Management does not like this, they desire plans for 2-3 years.

However, now they have changed to 4-quarter plans, where they allow the last two quarters to be vague, while the nearest is more definite. This has worked better” – Manager

In close connection to the flexibility inherent in the methods, a handful of interviewees highlighted the methodological difference between APM and TPM concerning how projects can be and are delivered. As disclosed in Table 4.1 one factor is project deliverability, where APM is favored when a project can be delivered incrementally. This was identified in the interviews as a potential obstacle when agile and traditional teams have to collaborate. In detail, one interviewee described how their agile team was delayed due to a dependency on a traditional team that was unable to provide parts of the required data. In this particular situation, the collaboration would have been more efficient if the two teams both applied an agile approach since the interviewee’s team would have been able to work with access to limited parts of the data.

“They [the traditional team] would like to complete the data set before the agile team can start working with the data, making it perfect. So we [the agile team] must wait for the whole database to be complete which can take a very long time before we can work with it. If both had been in the agile world, we would have been able to start creating value from the existing data, taking incremental steps to create value” – Agile Coach

On the contrary, other interviewees describe how traditional teams can get frustrated if they are provided with a delivery that does not meet their expectations. According to the interviewees, the challenge is especially evident when those who receive the delivery are not familiar with the agile approach.

“When someone who’s not familiar with agile awaits a delivery from an agile team, it can give rise to conflicts and clashes when the agile team is used to delivering projects in a certain way but the one waiting for the delivery has other expectations.” – Change Lead

To summarize, when methods applied by an organization are different, it has become evident that communication issues between teams can arise, especially if the methods inherit different terminology. As a consequence, misunderstandings and boundaries between teams can hamper efficient communication which can engender further issues for the organization. Nonetheless, these communication issues can arise between teams despite methods applied as declared in section 2.3. This aligns with declarations from multiple interviewees stating that misunderstandings and communication issues not only are a consequence of the chosen method but rather a result of other factors such as nationality and belonging to different organizations with their own culture and language. Therefore, a parallel to the declared challenge *Communication Issues* presented in 2.3 can be drawn, with the proposition that the risk of communication issues is greater between teams using different methods. This reasoning is further enhanced by interviewees describing that the issue of different



terminology was larger in the beginning before the firm had learned the implication of the new words.

“In the beginning it [new terminology] was a problem, but now everybody knows the words. At least it is not the biggest challenge” – Manager

Additionally, it is not surprising that methodological differences such as different levels of flexibility, provoking other issues within the organization, can pose a barrier between two different teams when they need to collaborate. Furthermore, the fact that several interviewees described the issues as more evident when teams are not used to each other’s methods indicates a connection between the previously described challenge of *Lack of Understanding of other Methods* and thus also the challenge of *Lack of Understanding* presented in 2.3. Thus, when the differences between the two methods are vast, it enhances the challenge for employees to establish an understanding of what the other method implies since it contrasts with what they are used to. Therefore, it can be concluded that methodological differences can emphasize the two general inter-team challenges, namely *Communication Issues* and *Lack of Understanding*, indicating that organizations that wish to apply a mix of methods to manage their projects are more likely to face these challenges.

### 4.2.3 ID3: Mismatch in Organizational Characteristics

The organization itself and its environment are considered a barrier to the utilization of APM among multiple interviewees. For instance, the interviewees disclosed that the firm and its processes are traditional and therefore do not always support APM. Similar challenges are widely discussed in the literature, but primarily concerning the adoption of APM in traditional organizations. Nonetheless, these challenges, originating from the contrast between an organization’s traditional nature and APM, can be equated with the coexistence of both methods. The reasoning is according to Van Waardenburg and van Vliet (2013) that when authors discuss the adoption of APM, both methods will temporarily exist simultaneously as well as the emerging challenges for such an environment. Therefore, *organizational barriers* is seen as a challenge that might arise in organizations where different project management methods coexist.

In detail, one interviewee described how agile teams sometimes are hindered by the financial system in the firm, as it is built for more traditional approaches where all teams can provide a project specification with a budget. This contrasts with APM, as agile teams are not able to provide such a clear specification as this inhibits the method’s flexible nature. Therefore, it is not unlikely that this can give rise to friction, as finance demands to know what the expected outcome of their investment is, but agile teams want to embrace changes. Other examples of where conflicts can arise, provided by interviewees, included reporting, documentation, and project management processes. However, some interviewees described that this was a larger issue earlier, claiming that this is something Ericsson is continuously working with. Nonetheless, an organization’s ability to support the coexistence of different meth-

ods is identified as a challenge that requires effort if an organization desires to utilize a mix of methods.

“Since we have traditional models and methodologies, some of our processes support more waterfall and traditional approach rather than agile. So sometimes there may be a bit of friction. However, we are addressing this as we are going along.” – Manager

Another issue highlighted by a handful of interviewees concerned the utilization of performance measurement, especially regarding the distinction between *key performance indicators* (KPIs) and *objectives and key results* (OKRs). The former evaluates an organization’s success in a specific activity and the latter serves as a framework to track the progress of an objective with the utilization of measurable results (Hao & Yu-Ling, 2018). During the interviews, it was repeatedly mentioned that there was a need for the organization to adapt the application of performance measurements to the specific method, specifically APM and TPM. A potential reason is that while KPIs are evaluating the progress on a set target, OKRs incorporate some flexibility in the way that it is evaluating the progress of fulfilling the goal (Hao & Yu-Ling, 2018). Moreover, OKRs emerge from the team members while KPIs typically are initiated by management for teams to follow (Hao & Yu-Ling, 2018). Hence, there is an alignment between OKRs and the nature of agile teams as well as between TPM and KPIs. Furthermore, some interviewees thought the emphasis on performance measurements was too large while another interviewee described that there seems to be confusion regarding the difference between the two. For instance, at the initiation of a project, the interviewee described that an agile team should state their OKRs, but the standardized template they are provided with is designed based on KPIs, indicating that the one creating the form as well as the ones filling in the template are not entirely sure of the differences between the two. As a consequence of the ambiguity concerning the two performance measurements, teams might waste time and therefore money, since the measurements are not correctly understood and applied.

“The more waterfall teams want to measure performance, they want to measure KPIs. That is a place where you get in a dilemma. Because a KPI, by default, has a different target than an OKR. So you might be measuring things from completely different angles” – Manager

An additional challenge brought up by multiple interviewees is the issue of allocating resources to projects, as the organization, according to them, sometimes seemed to hinder optimal allocation. For instance, one interviewee testified of the challenge to receive fully allocated teams for agile projects, something both the literature and multiple interviewees view as essential for APM. Some interviewees thought the issue arose as a result of a lack of understanding of the importance of fully allocated agile teams, while others thought it was due to Ericsson’s organizational structure, favoring traditional methods. Although lack of understanding is presumed to contribute to the struggle, it does not only derive from one side - i.e., only from the

organization. Rather, frustration from both agile teams and the traditional organization regarding the matter of fully allocating teams was identified in the interviews. For instance, some interviewees stated that not all resources could be allocated fully to agile teams although it is favored. In detail, one interviewee described how it would be inefficient if resources with cutting-edge competencies were allocated to only one team as this would imply that their specific knowledge would not be utilized in the most optimal way in the organization. Noteworthy, exceptions of fully allocated agile teams are previously disclosed in the literature by Croitoru (2018), who states that some team members only need to attend sprint meetings. Regardless, there seems to be an issue of how to allocate resources in an organization where one method highly favors fully allocated resources, while the organization is shaped to favor partial allocation. Thus, this issue serves as a potential organizational barrier for organizations desiring to utilize different methods to manage their projects and is presumed especially evident if the organization is traditional in the sense that it adopts a structure and culture which favors TPM rather than APM.

“I think Ericsson is facing a big challenge ahead. Because in agile teams, you want to utilize knowledge from individuals where it is most appropriate. You want to do this as frictionlessly as possible. The problem is that in large companies like Ericsson, you tend to be protective of your resources. So managers do not always want to lend resources. It can therefore require a huge effort to get the right person to participate in a cross-functional team. This is something Ericsson as a company needs to work with, to lower these barriers so that it is easier to get access to the right people in agile teams” – Change Lead

To conclude, as processes are aligned with the organizational structure, it became apparent through the interviews that issues can arise if no adjustments to the organizational environment are made - especially if methods favoring contrasting organizational structures are applied, just like APM and TPM, where APM is favored in an organic organization and TPM typically desires a mechanistic organizational structure – see Table 2.1. Moreover, as previously declared in subsection 4.1.4, an organization’s structure is closely interlinked with its culture. This further serves as a potential challenge for the coexistence of different methods. For instance, one interviewee mentioned that traditionally, employees were limited to performing specific tasks that only resided in their roles. Besides being a challenge for the employee in question, transitioning to an agile team where members are expected to take on various tasks regardless of their role, can pose a barrier to the adoption of APM. Hence, if an organization is hindering employees to extend their roles, they consequently hinder the empowerment of agile teams, an important factor for the favorability of APM as also stated in the Agile Manifesto. Lastly, in traditional organizations, management is often biased in favor of traditional approaches, where planning and monitoring are essential, which potentially can pose a further barrier to the adoption of APM (Pinton & Torres Junior, 2020) and thus the coexistence of both methods.

### 4.2.4 ID4: Synchronization Issues & Lack of Adjustment

For teams to adjust to and synchronize with other teams and the surrounding organization is identified as a third challenge from the interviews at the studied firm. This is particularly evident when teams are applying different project management methods. This challenge encompasses issues deriving from different cadences and resistance to adjusting to each other's methods. Collectively and independently, these issues pose a challenge for teams utilizing different methods to manage their projects.

Initially, the issue of different cadences was highlighted by more than ten interviewees. In APM, cadence is generally referred to as the length of a sprint and different cadences can therefore occur between various agile teams as well, which is a reason why this challenge is reported separately and not in conjunction with the challenge of *Methodological Differences* described earlier. For instance, if one team has a sprint length of two weeks and another of three weeks, it can be hard for teams to synchronize their work. Moreover, different cadence induces delays, as a team with a shorter cadence might not receive a delivery from a team (with a longer cadence) until their next sprint. This particular issue was mentioned by several interviewees that all agreed that the issue was more significant when an agile and a traditional team need to collaborate as the differences in cadence are considerably larger.

In detail, one interviewee stated that teams with different cadences are a source of conflict as agile teams cannot receive input fast enough. Although this is true between agile teams as well, the consequences are greater when teams using different methods are collaborating. For instance, one interviewee described how their team (which applied APM) was dependent on another team's data. The other team used TPM which implied that their cycles were significantly longer than the agile team's, up to two months compared to a few weeks. As a consequence, the progress of the agile team was impaired as they had to wait for several sprints for the other team to complete their cycle to receive the required input.

“If you have dependencies to another team, which often is the case, then it is hard if the other team works with a traditional approach, as that would mean that they do not have the same speed to deliver. Therefore, I think it is good that when dependencies exist between teams, both teams work similarly. It can mean that both work with a traditional approach or both with an agile approach, but if one team would use a traditional approach with long cycles and the other team would use agile with sprints of 3 weeks, then it can give rise to problems if there are dependencies between them” – Manager

Although synchronizing schedules and aligning work between teams utilizing different methods has been declared as challenging by multiple interviewees, it becomes even more challenging when teams are reluctant to make the necessary adjustment. This was an issue multiple interviewees stated to pose a hindrance to inter-team collaboration when different methods are used. For instance, one interviewee described that within their organization, some teams had adopted APM while other

teams had adopted a more traditional approach as this suited their respective needs better. However, the agile team viewed the method as a religion, meaning that everything should be agile leading to conflicts between these different teams. Another interviewee stated that this is true for both methods, where traditional teams can become religious due to a reaction to the strong culture of agile:

“And of course, on the other side, while you see someone being religious about agile, they become religious about waterfall or religious about their own project management method. So then it becomes a clash instead of a collaboration. ” – Manager

Moreover, although management support is declared to be important for promoting acceptance of APM in traditional environments in the literature (e.g., Bianchi, Conforto, Rebentisch, et al., 2021; Cockburn & Highsmith, 2001; Conforto et al., 2014), their role might be just as important to create acceptance of TPM among APM practitioners. This issue was highlighted by multiple interviewees having experience with both methods, as taking the chosen method too seriously and being too religious about it could potentially damage inter-team collaboration.

“Some people do not find the middle ground, some people feel more, I want to do everything agile and they become agile religious. I have seen it in other organizations and at Ericsson, where it is either this way or no way. I think that is difficult not only for communication but for change management. Because it is a change process. And of course, agile is just one more tool you can use. But when some people say I want to do it only this way, of course, it becomes a conflict. It makes it harder to change management and therefore harder to collaborate.” – Manager

Moreover, the resistance to adjusting to other teams’ methods is not only among teams but among other stakeholders in the organization such as managers and internal customers who can place an order as well. One interviewee mentioned that although employees at the organization are educated in APM, agile teams are often hindered by stakeholders not wanting to make necessary adjustments to allow the agile way of working.

“There are many times that we [the agile team] hear that we should not come here [to stakeholders] right now, but instead when we have a real product. But we need their feedback to deliver the right real product. This is a huge challenge to get them to be involved in the process” – Agile Coach

To conclude, the challenge of synchronizing and adjusting to other teams and to the organization is perceived as a challenge more evident in an environment where different methods coexist as the required adjustments are greater between teams using different methods, and between a team and an organization favoring a different method. As an inter-team issue, the challenge poses a barrier between different teams consequently causing misalignment in planning, ultimately giving rise to issues

such as frustrations and delays. Although misalignment is considered to originate from differences in the methods, it is the underlying resistance among team members that differentiates the two challenges.

Although resistance to change, which is a commonly described issue amongst multiple authors (e.g., Bovey & Hede, 2001; Coch & French Jr, 1948; Ford et al., 2008) can emerge regardless of methods applied, the likelihood for resistance is deduced to be higher when different methods coexist. The reasoning is that resistance to change is partly driven by a lack of understanding (Yılmaz & Kılıçoğlu, 2013). Therefore, a connection between *Synchronization Issues & Lack of Adjustment* and *Lack of Understanding of other Methods* can be drawn and thereby also to the inter-team challenge: *Lack of Understanding* presented in Table 2.3. Hence, when employees lack understanding of the other method they are more likely to show resistance which enhances this particular challenge.

Additionally, the issue of resistance to change further allows a connection to be drawn to the challenge of *Misalignment Issues* presented in 2.3, as this can be equated with an intra-team focus as discussed by Badampudi et al. (2013) and Vlietland and van Vliet (2014). Specifically, method religiousness, discussed by multiple interviewees, is considered to form an intra-team focus which prevents teams from adapting to each other and a common objective. Thus, parallels can be drawn between this challenge and the challenge of *Misalignment Issues*, indicating that the general issue is emphasized when teams adopt different methods. However, as the challenge also poses issues between teams and stakeholders, it can be stated that the challenge of synchronization and adjustment goes beyond inter-team issues thus leading to additional issues within an organization where different methods coexist.

### 4.2.5 ID5: Ambiguity in Individuals' Roles & Responsibilities

Uncertainties regarding individuals' roles and responsibilities are by more than ten interviewees at the studied firm considered to be a challenge as a result of different project management methods being used in the organization. This challenge includes issues emerging from the increased ambiguity regarding responsibility due to being assigned an unfamiliar role and a greater emphasis on individuals, in particular, leaders, that by transitioning from TPM to APM, thus have to adjust to a new method and its requirements. As a consequence, this can result in collaboration issues within and between teams, especially if the teams are utilizing different methods. Additionally, issues between teams and the surrounding organization can arise.

From the conducted interviews, several interviewees conveyed that many employees oftentimes were uncertain of what their roles in the new and different method implied. This was especially true for employees who previously worked in TPM, and are assigned a role in an agile team. For instance, one interviewee described

how there might be confusion regarding the responsibilities of product owners, primarily used in agile teams, in charge of the outcome of the project and prioritizing customers' requirements. In detail, the interviewee described how a product owner might take on a role more similar to a project manager, mainly used in TPM, responsible for managing the project based on its requirements. Consequently, this can create confusion within the team, as the responsibilities differ between the two roles. Notably, the occurring confusion of roles and responsibilities is thus not only due to a lack of understanding of what the roles imply, but rather a combination of having to assume a new role while transitioning between traditional and agile responsibilities of roles.

“I think there might be some issues regarding this [confusion of roles]. At least during the period when you are implementing a new model, such as agile. Then it is important to have coaches who know the method and can explain it, so you can close this gap [created by uncertainty regarding roles]. Then it can definitely happen. For instance, if you have a project leader that has only worked with a traditional method, and then they are supposed to take responsibility for an agile team, naturally conflicts and misunderstandings can arise.” – Change Lead

Additionally, interviewees described how confusion can arise if team members have not used APM previously, and therefore do not understand the role and responsibilities of a product owner, or they might even equalize it to a product manager. This can result in a misalignment in expectations and enhance the inter-team challenge of *Lack of Understanding* presented in Table 2.3, since misconceptions are more likely to occur. A reason for the increased ambiguity regarding what a role implies is identified as a lack of training and education, especially when the new method was implemented. For instance, one interviewee highlighted that the way in which the rollout of agile was done in the organization left employees untrained, and as a result of that, uncertain of what their new roles and the new method implied. This aligns with the statements of other interviewees, claiming that it is hard for employees to transition from TPM to APM without any basic training in the new method. As a result, they describe that confusion and frustration can emerge in the team.

“I think unfortunately the way the rollout was done was maybe a bit too quick and I want to say naive. People were a bit untrained in what their role actually means and so if somebody just tells you “Hi you’re going to be a product owner now, create a team and make your product!”. They don’t really say that part of your job role is to make sure that you’re creating something together with the other product owners and all these things. So I think it’s a culture that has been created from a lack of understanding of the roles and lack of training in the first place.” – Agile Coach

Another reason is provided by two other interviewees, describing that it often has been up to the person getting assigned the role to define it, which causes misalignment and confusion within the team, but also between teams that are collaborating,

since employees have interpreted the same role differently.

Furthermore, multiple interviewees describe how ambiguity concerning roles hinder efficient inter-team collaboration. For instance, a few interviewees described that it can make it hard for teams to relate to and understand each other.

“It’s not just that they’re not working in the same cadence but it’s just the fact that they don’t even have the same roles anymore within their teams so they find it hard to relate to each other in the way that they are working.” – Agile Coach

This is further considered to be even more challenging if there are also various definitions of the already different roles of APM and TPM. Moreover, multiple interviewees discussed the issue of handing over projects developed by agile teams to traditional teams assigned to preserve and maintain the projects. For instance, one interviewee described that the process of handing over a project included too many uncertainties, especially in regards to how teams best should be organized for the responsibilities to be handed over efficiently. This was agreed upon by a handful of interviewees, where one mentioned that there is a question to be solved regarding how the organization best should organize teams and different roles for the handover to be as efficient as possible, due to the large distinction between the two methods.

“When you work in an agile team you work with projects where the idea is that you will hand over these [to a traditional team] when the product is mature. Then you need to collaborate with the rest of the organization and other [traditional] teams. There needs to be clarification on how this will be done, how the handover should be achieved, and who is to take over the responsibility. It is not easy, especially as you often hand over projects to a line organization or to teams that are not working agile so they do not always have the same roles. It is not entirely clear and communication is difficult. This can definitely cause conflicts.” – Business Analyst

Another issue identified in the conducted interviews concerns the employees with roles that make them work together with both agile and traditional teams simultaneously. Here, one of the interviewees described the role to face different expectations in different teams leading to uncertainties regarding the role, what it really implies and how it should be adjusted depending on what project management method the team in question utilizes. The interviewee explains that the same confusion can apply to stakeholders that might be required to take on different roles in the different methods. This can be hard without receiving sufficient training in the area as employees often lack an understanding of the difference between being a stakeholder in APM and TPM.

In addition to increased ambiguity regarding different roles, an environment in which both APM and TPM are applied has shown to place a higher emphasis on individuals to adapt and expand their roles. Throughout the interviews, this issue was identified to be particularly prominent for leaders. In detail, the importance of management



to support and to utilize a suitable leadership style has been identified as important factors in the literature – see *management support & management style* in Table 4.1 – as well as by multiple interviewees. As previously declared, the management style appropriate for APM differs from the suitable style for TPM – *Leadership & Collaboration* versus *Command & Control* – therefore there is a need for managers to adjust their leadership to the method applied. This particular subject is highlighted by one of the interviewees who conveyed that management needs to adjust their leadership to provide guidance for both agile and traditional teams, which can be a challenge since the type of guidance is different between the two methods. Other interviewees emphasize the challenge further by stating that management often is traditional which can make it harder for them to adjust when using APM, where one interviewee describes the reasoning being that management often is reluctant to lose control, which can be seen as an implication of transferring from a leadership style favoring TPM when leading agile projects. Noteworthy is that almost all interviews described the issue of traditional leaders taking on a leadership style more in favor of APM. A potential reason is that most leaders within the studied firm are used to the traditional way of working and challenges are thus more evident in this direction. However, since APM and TPM are favored by different leadership styles, it is possible that similar issues can occur when adjustments from a style favoring APM to TPM are required. Thus, leaders' lack of ability to adjust their leadership style can pose a hindrance to the evolution of an environment appropriate for the chosen method, and therefore also the coexistence of both TPM and APM.

“What we need more if we’re going to work agile is to have inspirational leaders. They need to actually lead. The leadership in general needs to come around to this new way of working and actually understand what is expected of them.” – Agile Coach

In addition to an increased emphasis on leaders, a few interviewees highlighted the increased emphasis on the role of managers responsible for evaluating and providing feedback to employees, which in the studied firm often is the line manager, especially if some employees were assigned to agile teams. The interviewees described how line managers now are facing a larger challenge to make sure that employees in agile teams do not suffer since it can be harder for managers to provide the proper feedback and assessment when the overview of those employees is limited. Additionally, other interviewees mentioned that this can create uncertainties for the employees in agile teams, as they might not know to whom they should turn for leadership when not working traditionally, their line manager, or the manager responsible for the project. Thus, this creates a challenge both ways. For team members, it becomes hard to know who to see as their leader, and for managers, it requires an increased effort and understanding to, when leading agile teams, be present enough and knowledgeable of their employees' performance.

“Many of the resources I employ answer to a line manager, who’s responsible for setting their salary. However, I am the one who assigns tasks and provides feedback, so the challenge is that they see me more than

their line manager. The challenge is then, how will the line manager see if they perform well? Everyone wants to be seen for the work they perform and it's the line manager's responsibility to see them. ” – Manager

To conclude, ambiguity regarding individuals' roles and responsibilities is more likely to arise in environments where different methods coexist as different methods, for instance, generally have different emphases on roles and division of responsibilities. Moreover, this can create issues within and between teams as well as in the interface between a team and the surrounding organization, especially if limited or insufficient training and education of the methods have been provided. Consequently, misunderstandings and misalignment in expectations of roles and responsibilities between teams can arise which emphasizes a connection between this challenge and *Lack of Understanding of other Methods* and therefore also the inter-team challenge of *Lack of Understanding* presented in Table 2.3. However, since this challenge is deduced to not only occur due to a lack of understanding among employees but rather revolve around people and thus incorporate resistance to change, a distinction has been made between these two identified challenges. Noteworthy is that lack of understanding can be a driver of resistance to change, however, resistance can also emerge from other reasons such as changes in roles' freedom or power (Yılmaz & Kılıçoğlu, 2013). This can further be highlighted by considering the issue of gaining appropriate management support and style, which can be hard although management might possess sufficient knowledge and understanding of the new method. Hence, although this challenge is connected to a lack of understanding, it incorporates other factors that reside within humans. Moreover, the challenge, in contrast to *Lack of Understanding of other Methods*, goes beyond inter-team challenges as it also can give rise to issues within teams and between a team and the surrounding organization.

#### 4.2.6 Synthesis of Challenges Identified

To summarize, five challenges considered to arise as a result of the co-existence of APM and TPM were identified at the studied firm. Each challenge identified is composed of several issues that manifest the corresponding challenge, which can be viewed in Table 4.3. Noteworthy, the Table also illustrates the results of the coding process – described in section 3.4 – where issues can be equalized to concepts, and quotes to codes.

Although the identified challenges are all discussed and analyzed separately, they are not mutually exclusive. Rather, they interplay and amplify not only each other but also challenges that can occur regardless of methods used that are displayed in Table 2.3. Specifically, *Lack of Understanding of other Methods* is declared not only to be influenced by *Methodological Differences* but to greatly influence both *Ambiguity in Individuals' Roles & Responsibilities* and *Synchronization Issues & Lack of Adjustments*. That is since both these challenges are connected to resistance to change, where lack of understanding poses a driver. Since the inter-team challenge *Lack of Understanding* is enhanced by *Lack of Understanding of other Methods* and a majority of the identified challenges are connected to this challenge, the same ma-

jority is in turn also connected to *Lack of Understanding*.

Despite their strong connections to each other, distinctions have been made which differentiate the challenges. One such distinction concerns the areas of where the challenges are deduced to arise within an organization. In detail, *Lack of Understanding of other Methods* and *Methodological Differences* primarily pose issues between different teams, while *Misalignment in Organizational Characteristics* mainly arise in the interface between a team and an organization affiliated with different organizational characteristics. For instance, an issue will most likely evolve between an agile team and an organization that uses processes that are inflexible, hindering the agile way of working. *Synchronization Issues & Lack of Adjustments* and *Ambiguity in Individuals' Roles & Responsibilities* are, on the other hand, declared to arise in various areas within an organization that utilizes different methods. Hence, although the challenges and their corresponding issues are closely intertwined with each, a distinction has been made in this thesis in order to set them apart.

**Table 4.3:** Challenges identified at the studied firm with its respective issues

Challenge	Issue	Quote Manifesting the Issue
<b>Lack of Understanding of other Methods</b>	Lack of practical knowledge	"As a traditional team if you have never been exposed to agile it will be very difficult for you to understand how the agile team is working." - Agile coach
	Misconception of what other methods imply	"I think that it [misperception that agile doesn't plan] can affect the collaboration and increase conflict or friction between different teams." - Manager
<b>Methodological Differences</b>	Different terminology	"But also when you try to collaborate, they don't understand each other. So some people haven't got the same terminology and it's a terminology issue..." - Agile Coach
	Different level of flexibility	"Essentially what I am saying is that the product we are selling is so well-defined that we don't have a lot of flexibility for adjustments in the product." - Senior Manager
	Differing deliverability	"They [the traditional team] would like to complete the data set before the agile team can start working with the data, making it perfect. So we [the agile team] must wait for the whole database to be complete which can take a very long time before we can work with it" - Agile Coach
<b>Mismatch in Organizational Characteristics</b>	Processes favor one method	"Since we have traditional models and methodologies, some of our processes support more waterfall and traditional approach rather than agile. So sometimes there may be a bit of friction." - Manager
Table Continues on Next Page		

Continuation of Table 4.3

Challenge	Issue	Code Manifesting the Issue
<b>Synchronization Issues &amp; Lack of Adjustment</b>	Need to adapt performance measurements	<i>“The more waterfall teams want to measure performance, they want to measure KPIs. That is a place where you get in a dilemma. Because a KPI, by default, has a different target than an OKR. So you might be measuring things from completely different angles” — Manager</i>
	Hard to allocate resources	<i>“So managers do not always want to lend resources. It can therefore require a huge effort to get the right person to participate in a cross-functional team. This is something Ericsson as a company needs to work with, to lower these barriers so that it is easier to get access to the right people in agile teams.” — Change Lead</i>
	Hard to synchronize schedules	<i>“You have a team working in a specific structure, then you have a team working in another structure. One is frustrated because the other one is too slow, the other is frustrated because the other one doesn’t have anything ready.” — Manager</i>
	Resistance to adjust to other methods	<i>“Some people do not find the middle ground, some people feel more, I want to do everything agile and they become agile religious. I have seen it in other organizations and at Ericsson, where it is either this way or no way. (...) But when some people say I want to do it only this way, of course it becomes a conflict.” — Manager</i>
<b>Ambiguity in Individuals’ Roles &amp; Responsibilities</b>	Ambiguities about the meaning of roles	<i>“There might be some ambiguity within traditional teams regarding what a product owner is, especially if they have never worked agile. I, myself have not experienced this, but I can imagine that it can create some confusion.” — Manager</i>
	Increased emphasis to expand and adjust roles	<i>“What we need more if we’re going to work agile is to have inspirational leaders. They need to actually lead. The leadership in general needs to come around to this new way of working and actually understand what is expected of them.” — Agile Coach</i>
	Uncertainties in the handover of responsibilities	<i>“When handing over projects to the line organization [from an agile team] you need to collaborate and communicate with traditional teams. This can be challenging as these do not work agile.” — Business Analyst</i>

# 5

## Conclusion

The purpose of this thesis is to identify when APM is favorable to use and to identify potential challenges that could arise when different project management methods coexist within an organization. To fulfill this purpose and answer the study's research questions a thorough literature review was conducted to provide answers to the first research question, when APM is more favorable. Thereafter, an analysis of empirical data from the case study was performed to identify potential challenges (i.e., to answer the second research question). Jointly, these answers fulfill the thesis's purpose and aim.

Firstly, it can be concluded that whether APM is favorable is dependent on 21 factors which can be characterized into four areas, namely, *product*, *team*, *organizational* and *external characteristics*. In the literature, six project factors, five team factors, four organizational factors, and six external factors – see Table 4.1 – were identified to influence whether APM is favored compared to TPM. Consequently, the factors can provide guidance to when APM should be chosen over TPM and thus allow practitioners to use the most favorable method based on the specific context.

Furthermore, five challenges that are considered to arise as a result of the coexistence of different methods were identified at Ericsson, i.e., – APM & TPM. A brief presentation of these challenges is provided in Table 5.1. All but one of the identified challenges display similarities to the prevalent inter-team challenges presented in Table 2.3. Additionally, many of the identified challenges go beyond inter-team challenges and thus pose issues within teams and/or in the interface between teams and the surrounding organization.

**Table 5.1:** A summary of challenges identified in the studied firm

Challenge	Description of Challenge	Classification*
ID1: Lack of Understanding of other Methods	There is a lack of understanding concerning what different methods within the organization imply as employees are generally only exposed to one method. This can impair the inter-team collaboration between agile and traditional teams by causing misunderstandings and misconceptions.	<b>Inter-team challenge:</b> enhances <i>Lack of understanding</i>

Table Continues on Next Page

## 5. Conclusion

Continuation of Table 5.1

Challenge	Description of Challenge	Classification*
ID2: Methodological Differences	Differences in the methods can be a hindrance to efficient inter-team collaboration and lead to issues such as delays and misunderstandings.	<b>Inter-team challenge:</b> enhances <i>Communication issues</i> & <i>Lack of understanding</i>
ID3: Mismatch in Organizational Characteristics	There is a mismatch in the preferable organizational characteristics of different methods – i.e. APM & TPM, which consequently implies that the organization is considered as a barrier, in this case, for APM. Specifically, the organization's process, environment, and culture do not support the full utilization of APM.	<b>Challenge resides in the interface between a team and an organization</b>
ID4: Synchronization Issues & Lack of Adjustment	There is a challenge of synchronization, with other different teams and the surrounding organization, which can cause issues such as misunderstanding, frustration, and delays. This challenge is further enhanced by a lack of adjustment within the organization due to resistance among employees.	<b>Challenge resides between teams and between a team and an organization.</b> Partially connected to the inter-team challenges: <i>Misalignment issues &amp; Lack of understanding</i>
ID5: Ambiguity in Individuals' Roles & Responsibilities	There is ambiguity regarding individuals' roles and responsibilities within the organization partially due to lack of understanding. This can result in both intra- and inter-team collaboration issues as well as issues between teams and the surrounding organization.	<b>Challenge resides in the whole organization.</b> Partially connected to the inter-team challenge: <i>Lack of understanding</i>

\* Refers to where within an organization the challenge arises and the deduced links that can be drawn to the prevalent inter-team challenges in the literature – see Table 2.3

In detail, two of the challenges outlined in Table 5.1 – *Lack of Understanding of other Methods & Methodological Differences* – enhance the prevalent inter-team challenge an organization can face regardless of applied project management method, specifically *Lack of Understanding* – see Table 2.3. Additionally, *Methodological Differences* enhances the prevalent inter-team challenge *Communication Issues*. From the background of these conclusions, it can be deduced that organizations utilizing different methods simultaneously are more likely to face severe inter-team challenges if no mitigating actions are taken.

Moreover, *Synchronization Issues & Lack of Adjustments* and *Ambiguity in Individuals' Roles & Responsibilities* are broader challenges posing issues in the whole organization, i.e. – between teams, and between a team and the organization, where the latter challenge also poses issues within a team. Furthermore, both challenges are partially connected to the inter-team challenge *Lack of Understanding*, as this challenge is concluded to be one of several drivers for resistance to change, declared to be an underlying reason to both challenges. Additionally, *Synchronization Issues & Lack of Adjustment* is concluded to be partially connected to *Misalignment Issues* – see Table 2.3 – as well.

Lastly, *Mismatch in Organizational Characteristics* is not connected to any prevalent inter-team challenges since it resides in the interface between a team and an organization that favors certain organizational characteristics. Nor is it connected to lack of understanding to which the other challenges can be linked. Instead, this challenge arises as a result of the different methods' contrasting factors indicating their suitability. For instance, APM is favored in informal and organic organizational structures while TPM is favored in mechanistic structures which consequently causes a mismatch in organizational characteristics.

To conclude, an organization that wishes to apply different methods to manage its projects is more likely to face challenges within and between teams, as well as in the interface between teams and the surrounding organization. A majority of these challenges can be equated as amplifiers of other challenges while one challenge – *Mismatch in Organizational Characteristics* – is more unique to the environment where APM and TPM are used in parallel.





# 6

## Implications

In this chapter, practical implications and implications for future research are discussed and accounted for. In detail, the discussion in the first section is conducted in order to provide practitioners, specifically those within large organizations that influence the decision of the chosen method, with guidance on what the results of the thesis imply. Noteworthy is that although the advisory guidance in the discussion can be applied to other organizations it is primarily focused on Ericsson, which is the studied firm in this thesis. In the second section, the most predominant implications for future research, from the authors' perspective, are outlined and elaborated upon.

### 6.1 Practical Implications

This section aims to provide a more comprehensive discussion of the findings in section 4 of the study and what these imply for practitioners. Firstly, implications of the identified prevalent factors for the favorableness of APM will be discussed. Thereafter, the significance of the five identified challenges for organizations wishing to deploy different project management methods simultaneously will be discussed. Noteworthy is that although the discussion can be applied to several practitioners, it is primarily carried out for, and thereby especially applicable to Ericsson.

All in all, 21 factors were identified in this thesis to influence whether APM is more favorable to use compared to TPM – see Table 4.1. By being aware of these factors, practitioners can make more informed decisions before taking on a project and potentially make adjustments to increase the likelihood of successfully applying the chosen method. For instance, if a project is considered to have a low degree of uncertainty, complexity, and dynamism, practitioners might choose to employ a traditional method instead. Additionally, organizations might reconsider the utilization of APM, if its relationship with customers is purely transactional since it could imply that teams do not receive the necessary input for APM to be favorable. Therefore, practitioners could for instance, by allowing the identified factors to guide their choice of project management method, avoid the potential trap of applying trending albeit not favorable methods.

Furthermore, the factors have the potential of serving as a comprehensive foundation upon which practitioners with convenience can establish an understanding of different methods' differences. For instance, by communicating the identified

factors indicating if APM is favorable throughout the organization, employees and management can become more aware of the differences that can decrease the lack of understanding of other methods which is one of the identified challenges in organizations where different methods coexist. Thus, the factors can serve as a way to increase awareness within the entirety of an organization both top-down and bottom-up and thereby allow for corresponding actions to be taken to enhance the efficiency of the collaboration.

However, as the factors have been identified on the basis of what is most favorable for a specific project, it naturally raises questions of whether it is always favorable to apply a certain method from the perspective of project management. That is, just because a method is favorable for a project, it does not have to be the most favorable method for the organization as a whole. This ties back to the theory regarding project and project management success presented in section 2.2, where the former is a wider concept in which the latter can influence the outcome. Specifically, this implies that although a project is managed successfully, this does not guarantee the success of the project in the meaning that it satisfies other objectives of the organization. With the same reasoning, a project that has not been managed in the most successful way can still fulfill other objectives for the organization. For instance, a certain method might perform better than another concerning the project's time, cost, and quality – i.e., the criteria to measure project management success – but it might not perform as well in regards to sustaining a valuable customer relationship, something that might require more resources but in turn generate more long-term success for the organization. Thus, although a method is not favored for the success of the project, it can fulfill other objectives of the organization that the other method might not do. This being said, although APM might be deemed favorable, practitioners are recommended to assume an overarching and holistic perspective, which thus requires organization-wide communication, when choosing project management methods.

Additionally, apart from the success of a project and the organization, the identified factors are not taking other factors such as the preferences of employees into consideration. This was something that was noticed in one interview but was not included in the findings chapter since it was deemed to lie outside the scope of the study. Specifically, the interviewee described how although APM was applied more successfully to a project than the previous traditional method, a significant difference in employees' motivation was noticed. In this case, the use of APM meant that projects were divided into smaller sub-projects that were divided into smaller agile teams, in order for the method to be favorable. Although the method increased the project's efficiency, it also meant that employees lost the overall perspective and as a consequence the understanding of their contribution to the project as a whole. Ultimately, this implied that the employees did not find it as motivating to work. Consequently, this can imply that employees do not perform to their fullest potential or might even choose to leave the organization, resulting in a loss of important expertise, something that can affect the organization's ability to attract new talents. Thus, this example highlights an important learning for organizations that wish to

use the most effective project management method to not only think of their employees as resources they allocate to projects as this might affect the organization as a whole negatively. Practitioners are therefore urged to either take such factors into consideration in the decision process, by including the preference of employees in the decision-making of project management methods or to take other preventive measures. To conclude, the identified factors provide value to practitioners when they decide upon the use of a method, however, practitioners should also consider adjusting them to fit their particular organizations' needs and objectives.

Furthermore, five challenges due to the coexistence of different methods were identified at Ericsson. Similar to the factors, if practitioners are aware of these potential challenges and where they reside, they can more easily address them with appropriate mitigating actions. However, what these actions are lies beyond the scope of this study. Nonetheless, as these challenges are concluded to not be mutually exclusive but rather connected to each other, it is likely that actions to mitigate one challenge will help alleviate others as well. One potential mitigating action derived from the interviews is the employment of hybrid project management. As described in section 2.1.3, a hybrid method incorporates elements from both APM and TPM, and can thereby allow organizations to handle changes while following a set structure (Dumitriu et al., 2019). From the conducted interviews, it could not be deduced whether a hybrid method was more common than pure APM or TPM. However, multiple interviewees described how challenges were less severe if they made noticeable adjustments to the method to better fit the specific context. This can be interpreted as if hybrid has the potential to serve as a common middle-ground for organizations like Ericsson, wishing to apply a method depending on what is favored for the specific project. For instance, a hybrid method could potentially mitigate the challenges of both *Methodological Differences* and *Synchronization Issues & Lack of Adjustment*, since the differences between two hybrid teams are more likely to be smaller than between an agile and a traditional team. Additionally, the challenge of *Mismatch in Organizational Characteristics* could potentially be alleviated, since it is likely that the factors favoring an hybrid method is a compromise between the two extremes, i.e., – APM & TPM. Consequently, this could also mitigate the other challenges, due to the interconnection as described earlier. However, despite the potential for hybrid as a mitigating action, it is not clear whether the method can cause other challenges or issues currently unknown. Lastly, it is not clear what level of hybrid is required for it to have an impact since hybrid is viewed as the span between pure APM and TPM as illustrated in 2.1.

Another mitigating action practitioners might employ to address the identified challenges is based on the connection between multiple of the identified challenges and the prevalent inter-team challenge of *Lack of Understanding*. In Table 5.1 it can be viewed that all challenges except *Mismatch in Organizational Characteristics* are correlated to the fact that employees lack understanding, especially of the method they are not used to. For the studied firm, this could serve as a starting point and provide guidance on how to start addressing the challenges that can occur due to the coexistence of different methods. Specifically, potential mitigating actions could

include training programs providing all employees, not only team members but management and other internal stakeholders, with basic training in what agile and what an agile mindset entails. This is deemed especially important in proximity to the rollout of new and different methods, as the knowledge within the organization then is considered to be most limited. This is strengthened by the fact that some interviewees describe that it was harder to understand each other in the beginning and that training in what the method implied had facilitated the understanding. Thus, a potential starting point for practitioners can be to establish a mutual understanding among all employees of what the organization's different project management methods imply and when these should be utilized.

Additionally, broad and comprehensive training can further facilitate the creation of a unified culture in organizations, which often is hard in large and global organizations. Such a culture could potentially mitigate some of the identified challenges of this thesis as well as other prevalent challenges not due to the coexistence of different methods. For instance, the inter-team challenge of *Lack of Understanding* that can arise regardless of the coexistence of different methods could potentially be alleviated. Consequently, as this challenge influences several other challenges it is likely that other challenges will be mitigated as well, as discussed previously. Another action of creating a more unified culture is to allow employees to visit other sub-organizations, since it was evident from the interviews that the culture differed between different sub-organizations, e.g., *Group Supply* and *Group IT*.

As an additional action to manage the challenges and mainly improve the inter-team collaboration, the coordination and alignment between teams can be improved. In detail, organizations could formalize the coordination and alignment between teams by in advance mapping teams that will work together. Thereafter, kick-off meetings can be established between these teams' project managers, where they derive a common way of working and collaborating. This can, for instance, be a mutual hybrid method, especially if the teams consist of a mix of agile and traditional teams. As an even further means of facilitating efficient inter-team collaboration, written documentation, declaring the agreement between the teams could be required and produced. However, this is only possible if teams in advance know which other teams they need to collaborate with, which might not always be the case.

To conclude, this thesis provides practitioners with the basis upon which they are encouraged to, through various preventive measures, address the challenges that could arise when using TPM and APM concurrently to alleviate their effects and expectedly increase the efficiency of the organization. Although mitigation actions lay beyond the scope of this thesis, which implies that there is no scientific basis for the actions, practitioners are recommended to start by ensuring there is a mutual understanding of the different methods within their organization. This is recommended since parallels could be drawn between four of the five identified challenges to the inter-team challenge *Lack of Understanding*. This can further help practitioners to instill a more unified and integrated organizational culture, which could further act as a springboard for the studied firm to effectively mitigate the identified challenges

and perhaps even challenges that can arise within an organization regardless of the methods applied. Therefore, this thesis is considered valuable for practitioners to take the identified challenges into consideration when aiming to implement or work with different project management methods such as TPM and APM.

## 6.2 Implications for Research

This section outlines several areas of interest to explore that have been left undiscovered due to the limited scope of the study. Additionally, implications for research as a result of this study are accounted for and elaborated upon in the section.

In this study, factors for agile favorability were categorized into four categories, namely, project, team, organizational and external. This contrasts with earlier research, generally limited to focusing on specific areas that influence the favorability of the method. In future research, there is thus an opportunity to expand the findings in this study. Such an expansion can include the development of a more unified and comprehensive framework to be used by both researchers and practitioners to determine when APM should be applied. Apart from incorporating factors from various dimensions, such a framework could provide guidance on which method is favorable when not all factors indicate the favorableness for APM or when there is no clear indication. For instance, when project uncertainty cannot be declared as high or low but is instead something in between. Here, our research contributes to the identified factors in Table 4.1. However, there is room for improvement and thus for further research, as this thesis only identified the most prevalent factors influencing the choice. In consequence, further research could be conducted to expand the list of factors to ultimately develop such a framework encompassing information to help practitioners take even more informed project management decisions and to further expand the body of knowledge in this research area.

Additionally, the identified factors in the thesis contribute to further research on how the factors are connected and mutually influence each other. A further area of interest to explore in future research is to investigate the factors' relative relevance and influence on the choice of the method. For instance, whether high project uncertainty influences the choice of APM more than having a small team. Such research can include multi-case studies, where practitioners who influence the choice of APM are asked to rate, according to them, the relevance of a set of factors. That the relevance of the factors varies has already been determined, as the importance of co-located teams is not valued as critical, since many authors describe how the introduction of digital tools has enabled efficient communication and collaboration between distributed teams (Cohn, 2004; Dybå & Dingsøyr, 2008; Lee & Yong, 2010). This statement is further strengthened by the fact that a majority of the employees at the studied firm still worked from home due to COVID-19 without any, in their eyes, significant differences. As a result, the identified factors collectively serve as a foundation for future research where the magnitude of their respective impact can be investigated.

Moreover, this study was delimited to investigate the favorableness of agile on a higher abstraction level. However, since agile is a collective name for various methods – e.g., Scrum & Extreme Programming – there is a possibility for research to investigate whether the factors are applicable to these different agile methods or if there are differences between them.

Similarly, the findings concerning the second research question, of potential challenges that can arise when different project management methods coexist, can serve as a foundation for future research. Specifically, the generalizability of these challenges can be further evaluated by conducting more case studies at various organizations that simultaneously apply APM and TPM to manage projects. Such research might primarily focus on larger organizations since these often conduct several projects simultaneously. Moreover, it would be of interest to investigate whether the challenge differs between organizations with a global or national presence, and between organizations in different industries such as automotive, technology, and healthcare.

Additionally, this thesis further contributes by opening up new research opportunities such as examining the most appropriate mitigation actions to handle the challenges, something that could be of value for practitioners. For instance, further research, perhaps including a more comprehensive literature review, can be performed to more exhaustively identify relations between the challenges identified in this thesis and other challenges in the literature not dependent on the coexistence of different methods. Thereafter, additional case studies can be utilized to assess whether the mitigating actions to the respective challenge in literature could be applied to the identified challenges in this study.

Additionally, this thesis showed that interconnections could be drawn both between the different identified challenges and also between all but one of the identified challenges and the prevalent inter-team challenges – see Table 5.1. However, there is room for improvement concerning how these relationships and connections are established in detail, which could have been elaborated upon through further and more extensive research.

Furthermore, in this study challenges due to the coexistence of APM and TPM have been identified. However, there are other methods to manage projects that organizations might employ such as *Six Sigma* and *Lean* or even hybrid methods. It can therefore be of interest to investigate whether the challenges are independent of the methods applied within an organization or if other challenges would come to light if methods other than APM and TPM were used. Here, our research contributes with a basis upon which further research could build to expand the specific research area.

Lastly, as previously discussed, interviews at the studied firm gave the impression that hybrid methods have the potential to serve as a middle-ground and thus alleviate the identified challenges. However, since this thesis provided no scientific ground for this assertion, further researchers are encouraged to investigate the opportunity

of implementing hybrid to mitigate challenges in environments where different methods coexist and what potential drawbacks organizations should be aware of.





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# Appendices





# Appendix A – Interview Guide

The purpose of this interview is to gather data for a master's thesis study at Chalmers University of Technology which is conducted in collaboration with Ericsson. The aim of the study is to better understand how Ericsson is managing projects, and what experiences you have with different project management methods. We are also interested in knowing more about your experiences of team collaboration at Ericsson.

To participate in this interview is voluntary and all answers will be anonymous.

Despite this, we would like to inform you that full anonymity can not be guaranteed as limited interviews will be conducted and the interviews performed will be limited to Ericsson. Naturally, we will strive to ensure as high anonymity as possible. Lastly, we would also like to inform you that, if you choose to participate, you can at any time decline to answer specific questions or terminate the interview without feeling a need to explain a reason why.

To make sure we capture all details in the interview we would like to record the interview. These recordings will be kept safe throughout the process and will be deleted after completion of the study.

**Do you have any questions about the provided information?**

**If all information provided is clear, would you be willing to participate in the study, and do we have your permission to record this interview?**

This interview will start with some questions about your role at Ericsson and then transition into questions regarding the recent projects conducted, including the environment and setup. Once again, we would like to stress that we are not seeking any confidential information and that you at any time can decline to answer a specific question.

1. Please introduce yourself and your role at Ericsson?

## **Experiences of project management approaches**

2. As you likely know, there are different ways or methods for managing projects, like agile and waterfall. Which project management methods have you experienced, and what have been your experiences with these?

3. Based on your experience, do you feel like there are certain situations or environments in which agile project management works particularly well, or not at all?
  - Can you describe a project/situation in which agile has not worked well?
  - Can you describe a project/situation in which agile has worked well?
4. What do you think are the most important conditions needed for agile to work well?
5. Have you experienced any project/situation where you would have liked to used another method to manage a project than the one that was used?

### **Inter-team collaboration**

6. How do you feel that the collaboration and interaction with other teams work in general?
7. How does the collaboration get impacted by different approaches to project management? (e.g., being an agile team interacting with traditional teams or vice versa, teams with different methods, systems, or other ways of working).
8. What are typical challenges when collaborating and interacting with other teams?
  - How do you think these challenges are connected to how you work as a team?
9. Do you feel that there are other challenges, not concerning team collaboration, that can occur when different project management methods are used?

### **Ending questions**

10. Would it be okay if we reach out to you again for further questions?
11. Who would you recommend us to talk to next?



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